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- > **PROGRESS IN ENDING CHILD MARRIAGE**
- > **NCRB'S CRIME IN INDIA 2022 REPORT**
- > **SC VERDICT ON REVOCATION OF ARTICLE 370**
- > **28TH CONFERENCE OF PARTIES TO THE UNFCCC**
- > **DECODING GOOD GOVERNANCE**



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GS – 1

1. Critical Minerals

Why in News?

Recently, Government of India has made a significant move in the Mining Sector by launching the first-ever auction of **critical minerals**, offering **20 blocks for sale to Private Sectors**.

What are the Key Features of the First Auction of Critical Minerals?

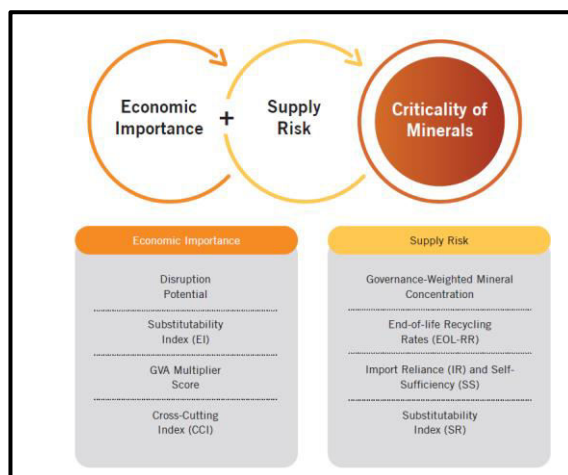
- This is the **first time that rights related to the mining of lithium ore are being auctioned to private sectors**. Other minerals in the blocks include nickel, copper, molybdenum, and rare earth elements (REEs).
- The mineral blocks are spread across **eight states, with Tamil Nadu having the most blocks (seven)**. Rights for these blocks vary; four blocks are auctioned for Mining Licences (ML), enabling immediate mining operations, while the remaining 16 blocks are auctioned for Composite Licences (CL), allowing geological exploration before mining.

What is the Background of the First Auction of Critical Minerals?

- The ongoing auction follows the **government's declaration of 30 minerals as "critical"** and amendments to mining laws.
- In July 2023, the government identified 30 minerals as Critical Minerals by amending the **Mines and Minerals (Development and Regulation) Act, 1957**, through the MMDR Amendment Act, 2023, empowering the Central Government to auction blocks of these minerals.
 - The **30 critical minerals are Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium**.
- The bidding is based on the highest percentage of mineral dispatch value quoted by bidders. Post this auction, a second tranche of critical mineral block auctions is anticipated.
 - The **Geological Survey of India (GSI)** is actively exploring critical mineral reserves across the country.

What are Critical Minerals?

- **Critical Minerals:**
 - Critical minerals are those minerals that are **essential for economic development and national security**, the lack of availability of these minerals or concentration of extraction or processing in a few geographical locations may **lead to supply chain vulnerabilities and even disruption** of supplies.
- **Declaration of Critical Minerals:**
 - It is a dynamic process, and it can evolve **over time as new technologies**, market dynamics, and geopolitical considerations emerge.
 - Different countries may have their own unique lists of critical minerals based on their specific circumstances and priorities.
 - The US has declared **50 minerals critical in light of their role in national security or economic development**.
 - **Japan has identified a set of 31 minerals as critical for their economy**.
 - The UK considers 18 minerals critical, EU (34) and Canada (31).



What is the Significance of Critical Minerals for India?

- **Economic Development:**
 - Industries such as **high-tech electronics**, telecommunications, **transport**, and **defense** heavily rely on these minerals.
 - Additionally, critical minerals are essential for green technologies like **solar panels**, **wind turbines**, **batteries**, and **electric vehicles**.
 - Given India's significant domestic demand and potential in these sectors, their growth can **lead to job creation**, **income generation**, and **innovation**.
- **National Security:**
 - These minerals are **vital for defense**, **aerospace**, **nuclear**, and **space applications**, necessitating the use of high-quality and reliable materials capable of withstanding extreme conditions and performing complex functions.
- **Environmental Sustainability:**
 - They are integral to the transition toward **clean energy and a low-carbon economy**, enabling the reduction of India's reliance on fossil fuels and greenhouse gas emissions.
 - With a commitment to attaining **450 GW of renewable energy** capacity by 2030, these minerals are essential for achieving India's green objectives.

What are the Challenges for India Related to Critical Minerals?

- **Implications of the Russia-Ukraine Conflict:**
 - Russia is a **significant producer of various critical minerals**, while **Ukraine** possesses reserves of **lithium**, **cobalt**, **graphite**, and **rare earth elements**.
 - The ongoing war between the two countries affects these critical mineral supply chains.
- **Limited Domestic Reserves:**
 - India has **limited reserves of critical minerals** such as lithium, cobalt, and other rare earth elements.
 - Most of these minerals are **imported**, making **India heavily dependent** on other countries for its supply. This reliance on imports can create vulnerability in terms of **price fluctuations**, **geopolitical factors**, and **supply disruptions**.
 - India heavily relies on imports for critical minerals like lithium and nickel, **with 100% import reliance for lithium and nickel**, and 93% for copper.
- **Increasing Demand for Minerals:**
 - The manufacturing of renewable energy technologies and the transition to electric vehicles necessitate larger quantities of minerals such as **copper**, **manganese**, **zinc**, **lithium**, **cobalt**, and **rare earth elements**.

Conclusion

- India has an opportunity to strengthen its international cooperation and partnerships through the strategic management of critical minerals. By participating in initiatives like the **Mineral Security Partnership (MSP)** led by the United States, **India can contribute to the establishment of global critical mineral supply chains**.
- Bilateral agreements with countries such as Australia, Canada, Japan, and South Africa can further enhance India's position in critical mineral exploration, development, processing, and trade.

Sl. No.	Critical Mineral	Percentage (2020)	Major Import Sources (2020)
1.	Lithium	100%	Chile, Russia, China, Ireland, Belgium
2.	Cobalt	100%	China, Belgium, Netherlands, US, Japan
3.	Nickel	100%	Sweden, China, Indonesia, Japan, Philippines
4.	Vanadium	100%	Kuwait, Germany, South Africa, Brazil, Thailand
5.	Niobium	100%	Brazil, Australia, Canada, South Africa, Indonesia
6.	Germanium	100%	China, South Africa, Australia, France, US
7.	Rhenium	100%	Russia, UK, Netherlands, South Africa, China
8.	Beryllium	100%	Russia, UK, Netherlands, South Africa, China
9.	Tantalum	100%	Australia, Indonesia, South Africa, Malaysia, US
10.	Strontium	100%	China, US, Russia, Estonia, Slovenia
11.	Zirconium(zircon)	80%	Australia, Indonesia, South Africa, Malaysia, US
12.	Graphite(natural)	60%	China, Madagascar, Mozambique, Vietnam, Tanzania
13.	Manganese	50%	South Africa, Gabon, Australia, Brazil, China
14.	Chromium	2.5%	South Africa, Mozambique, Oman, Switzerland, Turkey
15.	Silicon	<1%	China, Malaysia, Norway, Bhutan, Netherlands

Table 1 The net import reliance for critical minerals of India (2020) (Source: A report on 'Unlocking Australia-India Critical Minerals Partnership Potential' by Australian Trade and Investment Commission, July 2021)

2. Global River Cities Alliance: NMCG

Why in News?

Recently, the **National Mission for Clean Ganga (NMCG)**, has launched the **Global River Cities Alliance (GRCA)** at COP28 in Dubai, United Arab Emirates.

- During the event the NMCG also signed a Memorandum of Common Purpose (MoCP) with the **Mississippi River Cities and Towns Initiative (MRCTI)**, representing **124 cities/towns situated along the banks of the Mississippi River**, the United States.
- The NMCG has signed the MoCP on behalf of the **River Cities Alliance (RCA)**.

What is the Global River Cities Alliance (GRCA)?

- **About:**
 - The GRCA is an **international coalition of cities and countries dedicated to the conservation, sustainable management**, and protection of **river systems worldwide**.
 - The alliance encompasses a **diverse array of countries and river cities**, fostering partnerships among key nations like **India, Egypt, Netherlands, Denmark, Ghana, Australia, Bhutan, Cambodia, Japan, and others**.
 - GRCA's membership extends to **cover 275+ river-cities across 11 countries**, demonstrating a substantial global reach and influence.
- **Objective:**
 - It will serve as a platform for **collaboration, knowledge exchange**, and concerted efforts among various stakeholders, including governments, cities, financial institutions, and environmental organizations..

What is the Mississippi River Cities and Towns Initiative (MRCTI)?

- The **MRCTI was created in 2012** to provide an influential voice for the **Mississippi River**, dramatically increasing demand for **effective river protection, restoration, and management in Washington, DC**.
- It addresses matters of mutual concern, including **river water quality and habitat restoration, flooding and floodplain issues, river-focused recreation, sustainable economies**, and celebration of the River culture and history.

What is River Cities Alliance (RCA)?

- **About:**
 - The RCA is a **joint initiative of the Ministry of Jal Shakti (MoJS) & the Ministry of Housing and Urban Affairs (MoHUA)**, with a vision to connect river cities and focus on sustainable river centric development.
 - The Alliance focuses on **three broad themes-** Networking, Capacity Building and Technical Support.
 - Beginning with **30 member cities in November 2021**, the Alliance has expanded to 110 river cities across India and one international member city from Denmark.
- **Objective:**
 - The RCA intends to facilitate **knowledge exchange (online) for Indian cities** to learn new practices and approaches for urban river management.
 - It will also be an opportunity for international cities to learn about experiences in Indian cities, which may be relevant to their contexts.

What is the National Mission for Clean Ganga (NMCG)?

- **About:**
 - On **12th August 2011**, the NMCG was listed as a **society under the Societies Registration Act, 1860**.
 - It acted as the implementation arm of the **National Ganga River Basin Authority (NGRBA)** which was constituted under the provisions of the **Environment (Protection) Act (EPA), 1986**.
 - NGRBA was dissolved in 2016 and replaced by the **National Council for Rejuvenation, Protection, and Management of River Ganga**.
- **Objective:**
 - The objective of the NMCG is to **reduce pollution and ensure the rejuvenation of the Ganga River**.
 - **Namami Gange** is one of the Coveted Programmes of NMCG to clean Ganga.
 - This can be achieved by promoting intersectoral coordination for comprehensive planning & management and maintaining minimum ecological flow in the river, with the **aim of ensuring water quality and environmentally sustainable development**.
- **Organization Structure:**
 - The Act envisages a **five-tier structure at the national, state, and district levels** to take measures for prevention, control, and abatement of environmental pollution in river Ganga as below:
 - **National Ganga Council** under the chairmanship of the **Hon'ble Prime Minister of India**.
 - **Empowered Task Force (ETF) on river Ganga** under the chairmanship of Hon'ble Union Minister of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation).

- National Mission for Clean Ganga (NMCG).
- State Ganga Committees
- District Ganga Committees in every specified district abutting river Ganga and its tributaries in the states.

What are the Other Initiatives for River Rejuvenation in India?

- **Ganga Action Plan:** It was the **first River Action Plan that was taken up by the Ministry of Environment, Forest and Climate Change in 1985**, to improve the water quality by the interception, diversion, and treatment of domestic sewage.
 - The National River Conservation Plan is an extension to the **Ganga Action Plan. It aims at cleaning the Ganga River under the Ganga Action Plan phase 2.**
- **National Water Mission (2010):** It ensures integrated water resource management leading to **water conservation, less wastage, and equitable distribution forming better policies.**
- **Clean Ganga Fund:** In 2014, it was formed to clean up the Ganga, set up waste treatment plants, and conserve of biotic diversity of the river.
- **Bhuvan-Ganga Web App:** It ensures the involvement of the public in monitoring of pollution entering into the river Ganga.
- **Ban on Waste Disposal:** In 2017, the **National Green Tribunal** banned the disposal of any waste in the Ganga.

3. Persistence of Synchronized Extreme Rainfall in Changing Climates

Why in News?

Recently, a new study has been published by Advancing Earth and Space Sciences (AGU) titled- **Geographical Trapping of Synchronous Extremes Amidst Increasing Variability of Indian Summer Monsoon Rainfall**, highlighting that Indian Monsoon has undergone significant alterations due to **Global Warming**.

- The study investigates **synchronous extreme rainfall events** during the **Indian Summer Monsoon Rainfall (ISMR) from 1901 to 2019**. It highlights the consistent presence of interconnected extreme hubs in Central India, suggesting the geographical concentration of these concurrent events in the region.

How have been the Rainfall Trends in India?

- **Consistent Spatial Concentration:**
 - Despite the rising variability in Indian **Summer Monsoon** Rainfall (ISMR) over the past century, synchronous extreme rainfall events **have consistently concentrated within a specific geographical region**, primarily in **Central India (CI) that extends from parts of West Bengal and Odisha to parts of Gujarat and Rajasthan**.
 - This corridor has remained unchanged from 1901 to 2019!
 - This indicates a **stable pattern of synchronized extreme** events despite overall increased variability.
- **Network Cohesiveness:**
 - There is a **persistent network of highly interconnected extreme rainfall hubs** in CI. These hubs exhibit strong local connections, emphasizing a stable synchronization of extreme events in this region over the long term.
- **Correlation with Climatic Patterns:**
 - India's monsoon forecasts rely heavily on its relation to the **El Niño and the La Niña phenomena**, although this relation holds only about 60% of the time.
 - Indian Rainfall events are correlated with **El Niño Southern Oscillations (ENSO)**, with more **synchronization during strong El Niño periods** and less during La Niña conditions.
- **Implications for Predictability:**
 - The findings suggest that despite the increasing variability and complexity of ISMR, understanding the persistent nature of extreme rainfall synchronization in CI provides insights crucial for predicting synchronous extremes.
 - This knowledge can aid in developing effective adaptation strategies and risk management during the monsoon season.

What are the Implications of the Findings on the Forecast?

- **Revisiting Stationarity:**
 - Despite the belief that **stationary elements in climate systems no longer exist** due to global warming, the Indian monsoon's ability to synchronize heavy rain events **challenges this notion**.

- It suggests that certain consistent patterns, such as synchronized extreme rainfall events along specific corridors, **persist even in a changing climate.**
- **Understanding Corridor Dynamics:**
 - The **identification of a geographic corridor**, primarily the mountain ranges **along the west coast and across Central India**, as the **potential trapping zone for synchronized extreme rainfall events** and monsoon depressions provides a crucial insight.
 - This hypothesis would significantly enhance the understanding of how and where these events occur, aiding in more accurate forecasts.
- **Forecast Improvement:**
 - The research suggests that improving forecasts of synchronized extreme rainfall events doesn't necessarily require increased model resolution or higher computational costs.
 - Instead, **focusing on understanding the dynamics of synchronization within the existing models could lead to more accurate predictions.** This highlights a strategic shift in forecasting approaches.
- **Risk Reduction Strategies:**
 - Accurate forecasts of **these large-scale extreme rainfall events are vital for minimizing risks across various sectors** like agriculture, water management, energy, transportation, and public health.
 - The findings offer an **opportunity to refine risk reduction strategies at a smaller scale**, leveraging better forecasts **for preparedness and mitigation.**
- **Leveraging India's Resources:**
 - The study **emphasizes India's strong modelling capacity and computational resources**, positioning the country well to exploit this potential for better forecasting.
 - It highlights the capacity to delve deeper into understanding synchronization dynamics and optimizing forecasts, potentially minimizing the impacts of extreme rainfall events on various sectors.

What are the Factors Affecting the Indian Monsoon?

- **Himalayan Mountains:**
 - The **Himalayas** are a **major factor in the formation of the monsoon winds** in India.
 - During the **summer months**, the **landmass over the Indian subcontinent heats up** rapidly, leading to the formation of a low-pressure system.
 - The Himalayas, which act as a barrier, prevent the cool, dry air from the north from flowing into the region, resulting in a pressure gradient that draws in warm, moist air from the Indian Ocean.
- **Thar Desert:**
 - The Thar Desert, also known as the **Great Indian Desert**, is a crucial factor in the formation of monsoon winds in India.
 - It **acts as a rain shadow area for the Bay of Bengal branch of the monsoon**, meaning that it receives very little rainfall due to the barrier created by the **Aravalli Mountain range**.
 - Thus, the Arabian branch of the monsoon, which moves parallel to the Thar Desert, also leads to very little rainfall in the nearby regions.
 - **This lack of rainfall can have significant impacts on agriculture and the local economy in the region.**
 - The hot and dry air from the desert creates a low-pressure zone in the whole northwest parts of India, which draws in moisture-laden winds from the Indian Ocean, resulting in heavy rainfall during the summer months.
- **Indian Ocean:**
 - The **Indian Ocean** is a significant contributor to the formation of monsoon winds in India.
 - The ocean's warm and moist air interacts with the low-pressure system over the Indian subcontinent, resulting in the formation of the monsoon winds.

4. Surat Diamond Bourse

Why in News?

Recently, the **Indian Prime Minister** inaugurated the **Surat Diamond Bourse (SDB)** in Gujarat, marking a significant development in the **diamond** and jewelry industry.

- The SDB stands as the **world's largest office complex**. It aims to relocate the diamond trading hub from Mumbai to Surat, **leveraging Surat's diamond cutting and polishing expertise.**

What is the Status of the Diamond Industry in India?

- **About Diamond:** A diamond is a rare, naturally occurring mineral made up of pure carbon. The word diamond comes from the Greek word Adamas, which means **indestructible**.
 - Diamond occurs in two types of deposits, **primarily in igneous rocks of basic or ultrabasic composition** and in alluvial deposits derived from the primary sources.
- **Major Diamond Producing Countries:** Russia, Botswana, Canada, South Africa, Democratic Republic of the Congo.
 - Russia is the world's largest producer of rough diamonds, mining nearly 42 million carats in 2022.




Note

Recently, the **G7** group of countries have announced direct import restrictions on Russian-origin diamonds from January 2024 and **diamonds processed by third countries like India from March 2024**, which has raised major concerns for the Indian gems and jewelry trade and diamond processing industry.

- However, **Lab grown diamonds** are gaining traction for their eco-friendly nature.
- **Diamond Industry in India:** India is the world's largest cutting and polishing center for diamonds, accounting for over 90% of polished diamond manufacturing globally.
 - According to Indian Minerals Yearbook 2019, diamond fields of India are grouped into four regions:
 - **Central Indian tract of Madhya Pradesh**, comprising Panna belt.
 - **South Indian tract of Andhra Pradesh**, comprising parts of Anantapur, Kadapa, Guntur, Krishna, Mahabubnagar and Kurnool districts.
 - **Behradin-Kodavali area in Raipur district** and Tokapal, Dugapal, etc. areas in Bastar district of Chhattisgarh.
 - **Eastern Indian tract mostly of Odisha**, lying between Mahanadi and Godavari valleys.
 - In 2022, India ranks first among the top exporters in **cut & polished diamonds**.

What are Lab-Grown Diamonds?

- **About:**
 - Lab-grown diamonds (LGDs) are diamonds that are grown in a laboratory using advanced technology.
 - They are also known as **cultured, synthetic, man-made, or artisan-created diamonds**.
 - Natural diamonds form deep within the Earth over an extensive period, often up to three billion years, under extreme pressure and high temperatures.
 - LGDs have essentially the same chemical, optical and physical properties and crystal structure as natural diamonds.
 - Unlike mined diamonds, **lab-grown diamonds do not involve the social and environmental ramifications associated with mining activities**.
 - Consequently, all LGDs are considered eco-friendly and contribute positively to environmental preservation.
- **Production Methods:** LGDs are synthesized in laboratories via two primary methods: **chemical vapor deposition (CVD) or high pressure, high temperature (HPHT)**.
 - Both HPHT and CVD methods of growing diamonds artificially begin with a **seed**, a slice of another diamond.
- **Market Share in India:** India, known as a significant hub for diamond cutting and polishing, has experienced a notable surge in export earnings due to the increasing global demand for LGDs.
 - However, their current share in the overall diamond industry stands at **2-3%**.
 - To improve the share, In **Budget 2023-24**, the Union Finance Minister announced **elimination of Customs duty on imported seeds** used in the manufacturing process of rough LGDs.

Growth Process	Typical Growth Morphology
Natural	 Shape: Octahedron Growth: 8 directions
High Pressure, High Temperature (HPHT)	 Shape: Cuboctohedron Growth: 14 directions
Chemical Vapor Deposition (CVD)	 Shape: Cube Growth: 1 direction

5. Kakrapar Atomic Power Project

Why in News?

Recently, the fourth unit of **Kakrapar Atomic Power Station (KAPS)**, Gujarat has achieved its **first Criticality** — the beginning of the regulated fission reaction — paving the way for its eventual transition to generating power for commercial use.

What is Criticality?

- Criticality is the **first step towards power production**. A nuclear reactor is said to be critical when the nuclear fuel inside a reactor sustains a fission chain reaction.
- Each fission reaction releases a sufficient number of neutrons **to sustain a series of reactions**. Heat is produced in the event, which is used to generate steam that spins a turbine to create electricity.
 - **Fission is a process** in which the nucleus of an atom splits into two or more smaller nuclei, and some byproducts.
 - When the nucleus splits, the **kinetic energy of the fission fragments (primary nuclei) is transferred** to other atoms in the fuel as heat energy, which is eventually used to produce steam to drive the turbines.

What is the Significance of Achieving First Criticality?

- **Milestone for Power Generation:**
 - This stage demonstrates that the **reactor can produce a controlled and continuous chain reaction**, essential for sustained power generation. It's a precursor to full operation and power generation for commercial use.
- **Technology Advancements:**
 - The Kakrapar reactors, particularly Units 3 and 4, boast advanced safety features inspired by lessons from past nuclear incidents like the **Fukushima Daiichi disaster**.
 - These include steel-lined containment systems and passive decay heat removal systems, enhancing safety and reliability.
- **Energy Sustainability and Climate Goals:**
 - Nuclear energy, as a **low-carbon source**, **aligns with India's climate goals** to increase its renewable energy share.
 - India aims to generate 50% of its electricity from non-fossil fuel sources by 2030, as pledged at international forums like the **United Nations Convention of Parties (COP26)**.

What are the Key Points about the Kakrapar Reactor?

- Existing KAPS reactors Unit-1 and Unit-2 have a capacity of 220 MW each. But the new 700MW projects, Unit-3 and Unit-4, are **among the safest reactors** in the world.
- The **Unit-3 and 4 reactors have steel-lined inner containment systems** that prevent any radioactive material from escaping in case of an accident.
- They also have passive decay heat removal systems, which **safely cool down the reactor even when it is shut down**.

How has India's Nuclear Journey Been?

- **Early Development:**
 - India's nuclear program started in the 1940s and gained momentum with the establishment of the **Atomic Energy Commission (AEC) in 1948**.
 - Homi Bhabha, known as the **father of India's nuclear program**, played a pivotal role in its early stages.
- **Peaceful Nuclear Explosions:**
 - India conducted its **first peaceful nuclear explosion as operation Smiling Buddha** 1974, in Pokhran, marking its entry into nuclear technology.
 - In May 1998 Pokhran-II was conducted as a series of five nuclear tests including one thermonuclear test aimed **at demonstrating nuclear weapon capability**
- **Civil Nuclear Cooperation:**
 - Despite being outside the **Nuclear Non-Proliferation Treaty (NPT)**, India negotiated civil nuclear agreements with various countries, including the **Indo-US Civil Nuclear Agreement in 2008**, allowing for technology cooperation and nuclear fuel supply.
- **Indigenous Nuclear Capabilities:**
 - India developed indigenous nuclear technology, including **Pressurised Heavy Water Reactors (PHWRs)** and **Fast Breeder Reactors (FBRs)**, showcasing self-reliance and scientific prowess.
 - India's nuclear power generation capacity grew steadily, with the Nuclear Power Corporation of India Limited (NPCIL) leading the construction and operation of nuclear reactors across the country.

- **Safety and Regulations:**
 - India focused on stringent safety standards and regulatory measures overseen **by the Atomic Energy Regulatory Board (AERB)** to ensure the safe operation of nuclear facilities.
 - Nuclear energy played a role in diversifying India's energy mix, contributing to energy security and reducing dependence on fossil fuels.
- **Current Status and Future Plans:**
 - Currently, India has **23 nuclear power reactors** in operation under NPCIL (Nuclear Power Corporation of India), with a total capacity of **7,480 MW**.
 - NPCIL is constructing nine more reactors, including KAPS Unit-4, with a total capacity of 7,500 MW.
 - As of 2023, India has a **total generation capacity of 417 GW**, out of which **43 percent is from renewable sources**. However, nuclear energy still has a small role in India's total energy generation, despite its rapid growth.
 - In 2022-23, nuclear energy formed around 2.8 percent of India's total energy production, according to government data.
 - India has set ambitious targets to significantly increase its nuclear energy production, **aiming to triple its capacity by 2031**.
 - However, challenges such as **public concerns over safety, land acquisition, and regulatory hurdles remain**.

6. Land of Fire and Ice: Iceland

Why in News?

Recently, the **Government of Iceland** has confirmed that the **volcanic eruption** near the capital **Reykjanes** poses no threat to human life.

- Iceland is located on the **Mid-Atlantic Ridge**, technically the longest mountain range in the world, but on the floor of the **Atlantic Ocean**.
- The eruption began between **Sýlingarfell** and **Hagafell**, just north of the fishing town of **Grindavik** which is located on the **Reykjanes Peninsula**.

What are the Key Facts about Iceland (Land of Fire and Ice)?

- Iceland is located on the **Mid-Atlantic Ridge**, technically the longest mountain range in the world, but on the **floor of the Atlantic Ocean**.
 - The ridge separates the **Eurasian** and **North American tectonic plates** making it a hotbed of **seismic activity**. It is mostly a submarine, running along the length of the **Atlantic** from **north to south**.
 - However, in the North Atlantic, it rises over the ocean surface in the form of the island of Iceland. This feature of its geology has given rise to **Iceland's unique landscape** made up of **geysers (hot springs), glaciers, mountains, volcanoes and lava fields**.
- Iceland is home to **33 active volcanoes**, the **highest in Europe**. This unique landscape has given Iceland the epithet, '**Land of Fire and Ice**'.
 - **Eyjafjallajökull**, one of **Iceland's most famous volcanoes**, erupted in **2010**, causing a widespread **ash cloud**.
 - Other notable volcanoes include **Hekla, Grímsvötn, Hólhruun**, and **Litli-Hrútur**, part of the Fagradalsfjall system.



What are the Other Volcano-Prone Regions in the World?

- Volcanoes are distributed all around the world, mostly along the edges of **Tectonic Plates**, although there are intraplate volcanoes that form from **mantle Hotspots**.
- **Circum-Pacific Belt:**
 - The **Pacific "Ring of Fire"** is a **string of volcanoes** and sites located on most of the **Earth's subduction zones** having **high seismic activity**, around the **edges of the Pacific Ocean**.
 - The **Pacific Ring of Fire** has a total of **452 volcanoes**.
 - Most of the active volcanoes are found on its western edge, from the **Kamchatka Peninsula** in **Russia**, through the **islands of Japan** and **Southeast Asia**, to **New Zealand**.
- **Mid-Continental Belt:**

- This volcanic belt extends along the **Alpine Mountain system** of Europe, North America, through **Asia Minor, Caucasia, Iran, Afghanistan and Pakistan** to the **Himalayan Mountain system**, including **Tibet, the pamir, Tien-Shan, Altai**, and the mountains of **China, Myanmar and eastern Siberia**.
- This belt includes the **volcanoes of Alps mountains, Mediterranean Sea** (Stromboli, Vesuvius, Etna, etc.), **volcanoes of Aegean Sea, Mt. Ararat** (Turkey), **Elburz, Hindu Kush and Himalayas**.
- **Mid Atlantic Ridge:**
 - The Mid-Atlantic Ridge **separates the North and South American Plate from the Eurasian and African Plate**.
 - Magma rises through the cracks and leaks out onto the ocean floor like a long, thin, undersea volcano. As magma meets the water, it cools and solidifies, adding to the edges of the sideways-moving plates.
 - This process along the divergent boundary has created the **longest topographic feature in the form of Mid oceanic ridges** under the Oceans of the world.
- **Intraplate Volcanoes:**
 - The **5%** of known volcanoes in the world that are not closely related to plate margins are generally regarded as **intraplate, or "hot-spot," volcanoes**.
 - A hot spot is believed to be related to the rising of a **deep-mantle plume**, which is caused by very slow convection of highly viscous material in Earth's mantle.
 - It can be represented by a **single oceanic volcano** or **lines of volcanoes** such as the **Hawaiian-Emperor seamount chains**.

7. Illegal Sand Mining

Why in News?

Recently, Bihar police arrested sand smugglers in a major crackdown against **illegal sand mining**.

- This operation, near the **Sone River**, signifies a significant step in the ongoing battle against powerful criminal syndicates involved in illicit sand mining activities.

What is Sand Mining?

- **About:**
 - Sand mining is defined as the **removal of primary natural sand and sand resources** (mineral sands and aggregates) from the natural environment (terrestrial, riverine, coastal, or marine) for extracting valuable minerals, metals, crushed stone, sand and gravel for subsequent processing.
 - This activity, driven by various factors, poses serious **threats to ecosystems and communities**.
- **Source of Sand in India:**
 - **Sustainable Sand Mining Management Guidelines (SSMMG) 2016** suggest that the source of sand in India are through
 - River (riverbed and flood plain),
 - Lakes and reservoirs,
 - Agricultural fields,
 - Coastal / marine sand,
 - Palaeo-channels,
 - Manufactured Sand (M-Sand).

Factors Contributing to Illegal Sand Mining:

- **Lack of Regulation and Enforcement:**
 - Inadequate regulatory frameworks and weak enforcement mechanisms contribute to the proliferation of illegal sand mining.
- **High Demand for Construction Materials:**
 - The **construction industry's hefty demand for sand** fuels is illegal extraction, intensifying pressure on riverbeds and coastal areas due to the rising need for sand in construction projects.
 - Rapid **population growth and urbanization** drive the need for construction, escalating the demand for sand.
- **Corruption and Mafia Influence:**
 - Corrupt practices and the influence of organized **sand mafias** contribute to the continuation of illegal mining.
 - Collusion between authorities and illegal operators undermines efforts to control and regulate the sand mining industry.
- **Lack of Sustainable Alternatives:**

- Limited adoption of sustainable alternatives like **manufactured sand (M-sand)** contributes to overreliance on riverbed sand.
- Inadequate promotion of eco-friendly alternatives maintains the demand for natural sand, exacerbating environmental consequences.
- **Weak Environmental Impact Assessment (EIA) Implementation:**
 - Ineffective implementation of EIAs for sand mining activities allows for unauthorized extraction.
 - Insufficient public awareness and monitoring mechanisms contribute to illegal mining activities going unnoticed.

Consequences of Sand Mining:

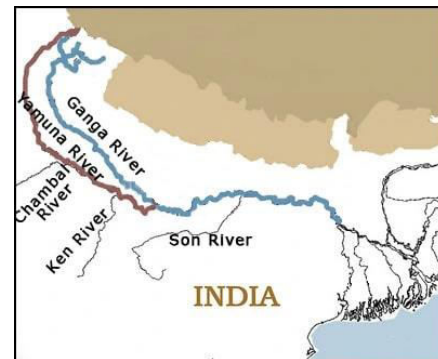
- **Erosion and Habitat Disruption:**
 - The **Geological Survey of India (GSI)** notes that unregulated sand mining alters riverbeds, leading to increased **erosion**, changes in channel morphology, and disruption of aquatic habitats.
 - Sand Mining leads to loss of stability in stream channels, threatening the survival of native species adapted to pre-mining habitat conditions.
- **Flooding and Increased Sedimentation:**
 - Depletion of sand from river beds contributes to increased **flooding and sedimentation in rivers** and coastal areas.
 - Altered flow patterns and sediment loads negatively impact aquatic ecosystems, affecting **both flora and fauna**.
- **Groundwater Depletion:**
 - Deep pits formed due to sand mining can cause a drop in the **groundwater table**.
 - This in turn affects **local drinking water wells**, leading to **water scarcity** in surrounding areas.
- **Biodiversity Loss:**
 - Habitat disruption and degradation arising from activities such as sand mining lead to the significant **loss of biodiversity**, adversely affecting both aquatic and riparian species. The destructive impact extends even to **mangrove forests**.

What are the Initiatives to Prevent Sand Mining in India?

- **Mines and Mineral Development and Regulation Act, 1957 (MMDR Act):**
 - Sand is classified as a “**minor mineral**”, under **The Mines and Minerals (Development and Regulations) Act, 1957 (MMDR Act)** and administrative control over minor minerals vests with the State Governments.
 - Section 3(e) of the MMDR Act aims to prevent illegal mining, with the government implementing laws to curb illicit practices.
 - The **Mines and Minerals (Development and Regulation) Amendment Act, 2023** was recently passed by the Parliament to **amend the MMDR Act, 1957**.
- **2006 Environment Impact Assessment (EIA):**
 - The Supreme Court of India mandated that **approval is required for all sand mining collection activities**, even in areas less than 5 hectares.
 - This decision aimed to address the severe impact of sand mining on the ecosystem, affecting plants, animals, and rivers.
- **Sustainable Sand Management Guidelines (SSMG) 2016:**
 - Issued by the Ministry of Environment, Forests, and Climate Change (MoEFCC), the main objectives of these guidelines include **environmentally sustainable and socially responsible mining**, conservation of the **river equilibrium** and its natural environment by **protection and restoration of the ecological system**, avoiding pollution of river water, and prevention of depletion of **groundwater reserves**.
- **Enforcement and Monitoring Guidelines for Sand Mining 2020:**
 - The guidelines provide a uniform **protocol for monitoring sand mining across India**.
 - The guidelines cover the identification of sand mineral sources, their dispatch, and their end-use.
 - The guidelines also consider the use of new surveillance technologies, such as drones and night vision, to monitor the sand mining process.

Sone River

- The Sone River, a **perennial river in central India**, is the **Ganges' 2nd-largest southern tributary**.
- Originating near **Amarkantak Hill in Chhattisgarh**, it flows through Chhattisgarh, Madhya Pradesh, Uttar Pradesh, and Bihar, forming waterfalls at the Amarkantak plateau.
 - It merges with the Ganges near Patna, Bihar.
- Tributaries include Ghaghar, Johilla, Chhoti Mahanadi, Banas, Gopad, Rihand, Kanhar, and North Koel River.
- Prominent dams include the **Bansagar Dam in Madhya Pradesh** and the **Rihand Dam** near Pipri in Uttar Pradesh.



8. Progress in Ending Child Marriage

Why in News?

A recent study published in 'The Lancet Global Health' journal sheds light on the **prevailing scenario of child marriage in India**, revealing both progress and setbacks in the fight against this deeply rooted practice.

What are the Major Trends Highlighted by the Study?

- **Status in India:**
 - Girl child marriages declined from **49% in 1993 to 22% in 2021**. Boy child marriages reduced from **7% in 2006 to 2% in 2021**, indicating an overall national decline.
 - However, between **2016 and 2021**, the progress plateaued, with certain states experiencing a troubling rise in child marriages.
 - Notably, six states witnessed an **increase in girl child marriages**, including **Manipur, Punjab, Tripura, and West Bengal**.
 - Eight states observed a rise in boy child marriages, encompassing **Chhattisgarh, Goa, Manipur, and Punjab**.
- **Global Trends:** Globally, progress against child marriage has been notable, but the **Covid-19 pandemic** threatens this advancement, putting approximately **10 million more girls at risk of child marriage** over a decade.

What are the Major Factors Associated with Child Marriage?

- **Economic Factors:** Families living in poverty might see **marriage as a means to reduce the economic burden** by transferring responsibility for the girl to her husband's family.
 - In some regions, the tradition of providing dowry can influence families to **marry off daughters at a young age to avoid higher dowry costs later**.
 - Also, in areas prone to **natural disasters or agrarian crises**, families facing economic hardships might resort to early marriage as a coping mechanism or to secure stability.
- **Social Norms and Traditional Practices:** Long-held customs and traditions often prioritize **early marriage as a social norm**, perpetuating the practice across generations.
 - **Pressure from the community or family** to conform to prevalent customs and traditions lead to early marriages, particularly for girls.
- **Gender Inequality and Discrimination:** Unequal power dynamics and **limited agency for girls compared to boys** contribute significantly to early marriage.
 - **Lack of access to education and opportunities for girls often pushes families to opt for early marriages**, viewing it as a way to secure their daughters' futures.

Note

UNICEF categorizes **child marriage as a human rights violation** due to its adverse impacts on the development of both girls and boys.

- **Sustainable Development Goal 5.3** states that Child marriage elimination is pivotal in achieving Sustainable Development Goal 5, aiming for gender equality and empowerment of women and girls by 2030.
- According to the UN, **1 in 5 young women worldwide** (19%) were married in childhood in 2022.

What are the Legislative Framework and Initiatives Related to Child Marriage in India?

- **Legislative Framework:** India enacted the **Prohibition of Child Marriage Act in 2006**, establishing the legal age for marriage at 21 for men and 18 for women.
 - Section 16 of the Prohibition of Child Marriage Act allows State Governments to appoint '**Child Marriage Prohibition Officers (CMPO)**' for specific areas.
 - CMPOs are responsible for preventing child marriages, collecting evidence for prosecutions, counseling against promoting or aiding such marriages, raising awareness about their harmful effects, and sensitizing communities
 - Government has introduced a bill namely '**the Prohibition of Child Marriage (Amendment) Bill, 2021 for raising the age of marriage of women to 21 years** to make it at par with the men.
- **Related Initiatives:**
 - **Dhanalakshmi Scheme:** It is a conditional cash transfer scheme for a girl child with insurance coverage.
 - It also aims to **eliminate child marriage by offering parents insurance coverage** of medical expenses and encouraging the education of the girl child.
 - Schemes like **Beti Bachao Beti Padhao (BBBP)**, also aims to empower girls through education, health and protection, and discourage child marriage.

Note

Odisha Government has devised a comprehensive strategy to tackle child marriage. They track girls' school attendance and village presence and utilize the "**Advika**" platform for girls aged 10 to 19.

- Guidelines are in place to **declare villages free of child marriage**, with incentives for vulnerable tribal groups.
- Districts implement various approaches, such as maintaining girl databases and mandating **Aadhaar numbers** in marriages.

Way Forward

- **Economic Empowerment Initiatives:** Offering **vocational training and entrepreneurship opportunities to girls at risk**, providing viable alternatives to early marriage.
 - Facilitate access to microloans for families, encouraging income generation and reducing financial pressure for early marriages.
- **Community Engagement through Art and Media:** Organizing **art-based workshops, theater performances, or community storytelling sessions** to engage and educate on the consequences of child marriage.
 - Collaborate with local artists and influencers to create impactful campaigns via music, street art, or short films.
- **Peer Education and Mentorship Programs:** Training **young leaders as advocates against child marriage**, empowering them to educate and mentor peers within their communities.
 - Introducing comprehensive education modules within schools, fostering discussions and awareness among students.

9. Shahi Idgah and Krishna Janmabhoomi Temple Dispute

Why in News?

The Allahabad High Court recently ruled that a survey will be conducted for the **Shahi Idgah**, a **three-domed mosque** in **Mathura**.

- It is seeking appointment of a **court commission** to inspect the **Shahi Idgah mosque** that stands adjacent to the **Krishna Janmabhoomi temple in Mathura**.

What is the History of the Disputed Land?

- Raja Veer Singh Bundela of Orchha had also built a temple on the same premises in **1618** and the mosque was built by **Aurangzeb in 1670** on the site of an earlier temple.
- The **Krishna Janmasthan temple in Mathura** is believed to have been built around **2,000 years ago**, in the **1st century CE**.
- A survey has been ordered due to demands by Hindu representatives for complete ownership of the premises where the **Keshava Deva temple** was destroyed on the orders of **Mughal emperor Aurangzeb in 1670**.
 - The area was regarded as nazul land — non-agricultural state land owned by the Marathas, and then the British.

- The temple was originally built in **1618** during the **reign of Jahangir** and was patronized by **Aurangzeb's brother** and rival, **Dara Shukoh**.
- In **1815**, the **Raja of Benaras** purchased the 13.77-acre land from the **East India Company**.
- Later, the **Shri Krishna Janmabhoomi Trust** was established.
 - The trust acquired ownership rights over the temple, and in **1951**.
 - The 13.77-acre land was placed under the trust with the condition that it would never be sold or pledged.
 - In **1956**, the **Shri Krishna Janmasthan Sewa Sangh** was set up to manage the affairs of the temple.
 - In **1968**, an agreement was signed between the **Sri Krishna Janmasthan Seva Sangh and the Shahi Idgah Masjid Trust**, where the temple authority conceded a portion of the land to the **Idgah** as part of the settlement.
 - The current dispute involves temple petitioners seeking possession of the entire parcel of land.

What is the Present Status of the Issue?

- The plea for a survey was filed on behalf of the Hindu deity, **Shri Krishna** and seven others, who in their original suit pending before court claimed that the mosque was built over the **birthplace of Shri Krishna** on the orders of **Mughal emperor Aurangzeb** in 1670.
 - Since the **Babri Masjid judgment in 2019**, nine cases related to the **Shri Krishna Janmabhoomi and Shahi Idgah Masjid**, have been filed in the **Mathura court**.
- The **Allahabad High Court** transferred to itself all the suits pending before the **Mathura Court** on various reliefs pertaining to the **Sri Krishna Janmabhoomi-Shahi Idgah Mosque dispute**.
- In the **High Court**, the **U.P. Sunni Central Waqf Board** and the **Shahi Idgah Masjid Committee** argued that the **birthplace of Lord Krishna** is not under the **Mosque**.
 - They stated that the plaintiffs' claim lacks evidence and is based on speculation.
- When the **Committee of Management Trust of the Shahi Idgah Masjid** sought a stay on the survey from the **Supreme Court**, the court did not grant any relief.

What is the Places of Worship Act, 1991?

- **About:**
 - It was enacted to **freeze the status of religious places of worship** as they existed on **August 15, 1947**, and prohibits the conversion of any place of worship and ensures the maintenance of their religious character.
- **Major Provisions of the Act:**
 - **Prohibition of Conversion (Section 3):**
 - Prevents the conversion of a place of worship, whether in full or part, from one religious denomination to another or within the same denomination.
 - **Maintenance of Religious Character (Section 4(1)):**
 - Ensures that the religious identity of a place of worship remains the same as it was on **August 15, 1947**.
 - The **Allahabad High Court's** recent stance in the **Gyanvapi case** suggests that the **Places of Worship Act, 1991** does not clarify "**religious character of any place of worship**" and can only be determined in a trial, based on documentary and oral evidence, on a case-to-case basis.
 - **Abatement of Pending Cases (Section 4(2)):**
 - Declares that any ongoing legal proceedings concerning the conversion of a place of worship's religious character before **August 15, 1947**, will be terminated, and no new cases can be initiated.
 - **Exceptions to the Act (Section 5):**
 - The Act does not apply to **ancient and historical monuments**, archaeological sites, and remains covered by the **Ancient Monuments and Archaeological Sites and Remains Act, 1958**.
 - It also excludes cases that have already been settled or resolved and disputes that have been resolved by mutual agreement or conversions that occurred before the Act came into effect.
 - The Act does not extend to the specific place of worship known as Ram Janmabhoomi-Babri Masjid in Ayodhya, including any legal proceedings associated with it.
 - **Penalties (Section 6):**
 - Specifies penalties, including a maximum imprisonment term of three years and fines, for violating the Act.

GS Paper – 2

1. 2023 World Malaria Report

Why in News?

The **2023 World Malaria Report**, recently released by the **World Health Organization (WHO)**, sheds light on the alarming **malaria** situation in India and globally.

What are the Key Highlights of the Report?

- **Global Malaria Overview:**
 - The 2023 World Malaria Report reveals a global surge with an estimated **249 million cases in 2022, surpassing pre-pandemic levels.**
 - **Covid-19** disruptions, **drug resistance**, humanitarian crises, and **climate change** pose threats to the global malaria response.
 - Twenty-nine countries accounted for 95% of malaria cases globally.
 - Four countries, **Nigeria (27%), the Democratic Republic of the Congo (12%), Uganda (5%), and Mozambique (4%),** accounted for almost half of all malaria cases globally.
- **India's Malaria Scenario:**
 - In 2022, **India** accounted for a staggering **66% of malaria cases** in the WHO South-East Asia Region.
 - **Plasmodium vivax**, a protozoal parasite, contributed to almost 46% of cases in the region.
 - Despite a **55% reduction in cases since 2015**, India remains a significant contributor to the global malaria burden.
 - India faces challenges, including a surge in cases in 2023 linked to unseasonal rainfall.
 - **India and Indonesia** accounted for about **94% of all malaria deaths** in the WHO South-East Asia Region.
- **Regional Impact:**
 - **Africa bears the highest malaria burden**, accounting for 94% of cases and 95% of global malaria deaths in 2022.
 - The WHO South-East Asia Region, including India, managed to contain malaria over the last two decades, with a **77% reduction in cases and deaths since 2000.**
- **Climate Change and Malaria:**
 - Climate change emerges as a major driver, affecting malaria transmission and overall burden.
 - Changing climate conditions enhance the sensitivity of the malaria pathogen and vector, facilitating its spread.
 - WHO emphasizes the substantial risk climate change poses to malaria progress, necessitating sustainable and resilient responses.
- **Global Eradication Goals:**
 - WHO aimed to reduce malaria incidence and **mortality rates by 75% in 2025 and 90% in 2030.**
 - The world is off-track, with a **55% gap for 2025 incidence reduction and 53% for fatality rate reduction.**
- **Challenges in Malaria Eradication:**
 - Funding gaps for malaria control increased from USD 2.3 billion in 2018 to USD 3.7 billion in 2022.

- Research and development funding hit a 15-year low at USD 603 million, raising concerns about innovation and progress.
- **Malaria Vaccine Advancements and Achievements:**
 - The report emphasizes notable progress in malaria prevention through the phased introduction of the **WHO-recommended malaria vaccine, RTS,S/AS01**, in African nations.
 - Rigorous evaluations in Ghana, Kenya, and Malawi reveal a significant **decrease in severe malaria and a 13% reduction in early childhood deaths**, affirming the vaccine's effectiveness.
 - This achievement, combined with existing interventions like bed nets and indoor spraying, forms a comprehensive strategy, leading to improved overall outcomes in these regions.
 - In October 2023, WHO recommended a second safe and effective malaria vaccine, **R21/Matrix-M**.
 - The availability of two malaria vaccines is expected to increase supply and make broad-scale deployment across Africa possible.
- **Call for Action:**
 - WHO emphasizes the need for a substantial pivot in the fight against malaria, calling for increased resources, strengthened political commitment, data-driven strategies, and innovative tools.
 - Sustainable and resilient malaria responses aligning with climate change mitigation efforts are deemed essential for progress.

What is Malaria?

- Malaria is a life-threatening mosquito borne blood disease caused by **plasmodium parasites**.
 - There are 5 Plasmodium parasite species that cause malaria in humans and 2 of these species – **P. falciparum and P. vivax** – pose the greatest threat.
- Malaria is predominantly found in the tropical and subtropical areas of Africa, South America as well as Asia.
- Malaria is spread by the bite of an **infected female Anopheles mosquito**.
 - The **mosquito becomes infected** after biting an infected person. The malaria parasites then enter the bloodstream of the next person the mosquito bites. The parasites travel to the liver, mature, and then infect **red blood cells**.
- Symptoms of malaria include fever and flu-like illness, including shaking chills, headache, muscle aches, and tiredness. Notably, **malaria is both preventable and curable**.

What are the Initiatives Related to Malaria?

- **Global:**
 - **WHO's Global Malaria Program(GMP):**
 - The WHO's GMP is responsible for coordinating WHO's global efforts to control and eliminate malaria.
 - Its work is guided by the "**Global technical strategy for malaria 2016–2030**" adopted by the **World Health Assembly** in May 2015 and updated in 2021.
 - The strategy sets the target of reducing global malaria incidence and mortality rates by **at least 90% by 2030**.
 - **Malaria Elimination Initiative:**
 - Spearheaded by the **Bill and Melinda Gates Foundation**, this initiative focuses on eradicating malaria through diverse strategies such as treatment accessibility, mosquito population reduction, and technology development.
 - **E-2025 Initiative:**
 - The WHO launched the **E-2025 initiative in 2021**. The initiative aims to stop the transmission of malaria in 25 countries by 2025.
 - The WHO has identified **25 countries that have the potential to eradicate malaria by 2025**.
- **India:**
 - **National Framework for Malaria Elimination 2016-2030:**
 - Aligned with WHO's strategy, aims to **eliminate malaria across India by 2030** and maintain malaria-free zones.
 - **National Vector-Borne Disease Control Programme:**
 - Addresses various **vector-borne diseases**, including malaria, through prevention and control measures.
 - **National Malaria Control Programme (NMCP):**
 - To combat devastating effects of Malaria, the NMCP was launched in 1953 built around three key activities - insecticidal residual spray (IRS) with DDT; monitoring and surveillance of cases; and treatment of patients.
 - **High Burden to High Impact (HBHI) Initiative:**

- Initiated in four states (West Bengal, Jharkhand, Chhattisgarh, and Madhya Pradesh) in 2019, focusing on malaria reduction through insecticidal net distribution.
- **Malaria Elimination Research Alliance-India (MERA-India):**
 - Established by the **Indian Council of Medical Research (ICMR)**, collaborates with partners on malaria control research

2. All India Judicial Service

Why in News?

Recently, the **President** of India advocated for **All India Judicial Service (AIJS)** to enhance diversity in the judiciary by increasing representation from marginalized social groups.

What is All India Judicial Service (AIJS)?

- **About:**
 - AIJS is a proposed **centralized recruitment system for judges** at the level of additional district judges and district judges across all states.
 - AIJS aims to centralize the recruitment of judges, similar to the **Union Public Service Commission (UPSC) model**, assigning successful candidates to states.
 - Originating from **Law Commission reports in 1958 and 1978**, AIJS seeks to address structural issues like varying pay, faster vacancy filling, and standardized nationwide training.
 - The **idea was revisited in 2006** by the Parliamentary Standing Committee, supporting a pan-Indian judicial service.
- **Constitutional Basis:**
 - **Article 312 of the Constitution** provides for the establishment of AIJS, similar to central civil services, upon a resolution by the **Rajya Sabha supported by at least two-thirds of its members**.
 - However, Article 312 (2) states that the AIJS cannot include any post inferior to that of a district judge, as defined in Article 236.
 - According to Article 236, a district judge can include a city civil court judge, additional district judge, joint district judge, assistant district judge, chief judge of a small cause court, chief presidency magistrate, additional chief presidency magistrate, sessions judge, additional sessions judge, and assistant sessions judge.
- **Need:**
 - AIJS would ensure a uniform and **high standard of selection** and training of judges, enhancing the quality and efficiency of the judiciary.
 - AIJS would **fill the vacancies of judges** in the lower courts, which are presently around **5,400 vacant positions in lower judiciary** across the nation and **pendency of 2.78 crore cases** in lower judiciary primarily due to inordinate delay in holding regular exams by states.
 - AIJS would increase the representation and diversity of judges from different regions, genders, castes, and communities, reflecting the **social composition of the country**.
 - AIJS would reduce the **scope for judicial or executive intervention** in the appointments to the judiciary, ensuring the **independence and accountability of the judges**.
 - AIJS would create a pool of talented and experienced judges who can be appointed to the higher judiciary, improving the career prospects and mobility of the judges.
- **Current Status:**
 - As of 2023, there is **no consensus on AIJS** due to diverging opinions among major stakeholders.
 - The AIJS proposal remains an unimplemented initiative, highlighting the challenges in achieving consensus for its establishment.

How are District Judges Recruited Currently?

- The current system involves **Articles 233 and 234** granting states the authority over the appointment of district judges, managed through State Public Service Commissions and High Courts, since HCs exercise jurisdiction over the subordinate judiciary in the state.
 - Panels of HC judges interview candidates after the exam and select them for appointment.

- **Article 233** deals with the **appointment of district judges**. Appointments of persons to be, and the posting and promotion of, district judges in any State shall be made by the **Governor of the State** in consultation with the High Court exercising jurisdiction over such State.
- **Article 234** deals with the **recruitment of persons other than district judges** to the judicial service.
- All judges of the lower judiciary up to the level of district judges are selected through the Provincial Civil Services (Judicial) exam. PCS (J) is commonly referred to as the judicial services exam.

What are the Concerns Regarding AIJS?

- It would infringe upon the **federal structure** and the autonomy of the states and the high courts, who have the constitutional right and responsibility to administer the subordinate judiciary.
- It would create a conflict of interest and a dual control over the judges, who would be accountable to both the **central and the state governments**.
- It would disregard the local laws, languages, and customs of the different states, which are essential for the effective functioning of the judiciary.
- It would affect the morale and motivation of the **existing judicial officers**, who would be deprived of the opportunities and incentives for their career advancement.

Way Forward

- Facilitate dialogues and consultations with states, high courts, and legal experts to address concerns and garner support for AIJS.
 - Consider implementing AIJS on a **pilot basis** in select states to assess its impact and address concerns gradually.
- Design AIJS with flexible mechanisms allowing adaptation to local laws, languages, and customs, ensuring effective functioning without disregarding regional nuances.
 - Propose a **well-defined transition period** during which existing judicial officers can seamlessly adapt to the new system, minimizing disruptions.
- Establish a **periodic review mechanism** to assess the impact of AIJS on federal structure, autonomy, and the effective functioning of the judiciary, making necessary adjustments as needed.
- Develop an **incentive structure within AIJS** that motivates and recognizes the contributions of existing judicial officers, addressing concerns about career advancement.

3. NCRB's Crime in India 2022 Report

Why in News?

The **National Crime Records Bureau (NCRB)** has recently unveiled its annual report titled "**Crime in India for 2022**," providing a comprehensive overview of **crime trends across the nation**.

What are the Key Highlights of NCRB's Crime in India 2022 Report?

- **Overall Crime Statistics:**
 - A total of over 58,00,000 **cognizable crimes** were registered, comprising both the **Indian Penal Code (IPC)** and **Special & Local Laws (SLL)** crimes.
 - The **registration of cases witnessed a 4.5% decline** compared to 2021.
- **Crime Rate Decline:**
 - The crime rate per lakh population dropped from **445.9 in 2021 to 422.2 in 2022**.
 - This decline is considered a more reliable indicator, considering the **impact of population growth on absolute crime numbers**.
- **Safest City:**
 - Kolkata emerged as the **safest city in India for the third consecutive year**, recording the **least number of cognisable offences** per lakh population among metropolises.
 - **Pune (Maharashtra)** and **Hyderabad (Telangana)** secured the second and third positions, respectively.
- **Rise in Cyber Crimes:**
 - Cybercrime reporting **surged by 24.4%**, totalling 65,893 cases, a significant surge from 52,974 cases in 2021.
 - Cyber fraud constituted the majority of cases (64.8%) of registered cases, followed by **extortion** (5.5%), and **sexual exploitation** (5.2%).
 - The crime rate under this category rose from 3.9 in 2021 to 4.8 in 2022.

- **Suicides and Causes:**
 - In 2022, India witnessed a **significant surge in suicides**, totalling over 1.7 Lakh cases, reflecting a concerning **increase of 4.2% compared to 2021**.
 - The **suicide rate also rose by 3.3%**, calculated as the number of suicides per lakh of the population.
 - Major causes included **'Family Problems,' 'Marriage Related Problems,' Bankruptcy and indebtedness, 'Unemployment and professional issues' and Illness**.
 - **Maharashtra reported the highest number of suicides**, followed closely by Tamil Nadu, Madhya Pradesh, Karnataka, Kerala, and Telangana.
 - **Daily wage earners constituted a significant portion**, accounting for 26.4% of the total suicides.
 - **Agricultural workers and farmers** were also disproportionately affected, forming a substantial part of the suicide statistics.
 - This was followed by unemployed persons, who comprise 9.2% of all suicides reported in India in 2022. Among all suicides reported in the year, **over 12,000 were of students**.
- **Escalating Crimes Against SCs and STs:**
 - The Crime in India report highlighted an overall increase in crimes and atrocities against **Scheduled Castes (SC) and Scheduled Tribes (ST) persons**.
 - States like **Rajasthan, Madhya Pradesh, Chhattisgarh, and Telangana experienced a surge in such cases in 2022**.
 - **Madhya Pradesh and Rajasthan** persist as key contributors, consistently ranking among the top five states with the highest occurrences of crimes and atrocities against SC and ST communities.
 - Other states witnessing elevated levels of such offences include **Bihar, Uttar Pradesh, Odisha, and Punjab**.
- **Crimes Against Women:**
 - A total of 4,45,256 cases of crime against women were reported in 2022, **marking a 4% increase from 2021**.
 - Dominant categories included **'Cruelty by Husband or His Relatives,' 'Kidnapping & Abduction of Women,' and 'Assault on Women with Intent to Outrage Her Modesty.'**
- **Crimes Against Children:**
 - Cases of crimes against children showed an increase of 8.7% compared to 2021.
 - A majority of these cases related to **kidnapping and abduction (45.7%)** and 39.7% were filed under the **Protection of Children from Sexual Offences Act**.
- **Crime against Senior Citizens:**
 - Cases of crimes against senior citizens rose by 9.3% to 28,545 cases compared to 26,110 cases in 2021.
 - A bulk of these cases (27.3%) related to hurt followed by **theft (13.8%)** and **forgery, cheating, and fraud (11.2%)**.
- **Animal Attacks on the Rise:**
 - The NCRB report reveals a concerning trend in the number of **people dying or getting injured due to animal attacks**.
 - A significant **19% increase** in such incidents was recorded in 2022 compared to 2021.
 - **Maharashtra reported the highest number of cases**, Uttar Pradesh, Odisha, Tamil Nadu, Chhattisgarh, and Madhya Pradesh followed with varying numbers of reported cases.
 - In addition, the number of **animal/reptile and insect bites cases** also increased by **16.7%**.
 - The highest number of bite cases were reported from Rajasthan followed by Madhya Pradesh, Tamil Nadu and Uttar Pradesh, respectively.
- **Environment-Related Crime:**
 - The total number of **environmental crimes in India decreased by around 18% in 2022**, compared to 2021.
 - Environment-related offenses include violations under seven acts :
 - **The Forest Act, 1927, Forest Conservation Act, 1980, The Wildlife Protection Act, 1972, The Environmental (Protection) Act, 1986, Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention & Control of Pollution) Act, 1974, The Noise Pollution (Regulation and Control) Rules, 2000, National Green Tribunal Act, 2010.**
 - The cases registered for violating the **Air (Prevention and Control of Pollution) Act, 1981** and the **Water (Prevention & Control of Pollution) Act, 1974** have increased by around **42%**.
 - Violations registered under the **Environmental (Protection) Act, 1986** also have increased by around 31%.
 - **Forest offences** increased in four states **Andhra Pradesh, Karnataka, Maharashtra and Haryana**.
 - **Wildlife offences** increased in five states including **Bihar, Punjab, Mizoram, Rajasthan and Uttarakhand**.
 - **Rajasthan**, with the maximum number (30%) of wildlife crime cases in the country, recorded a **50% increase** in such offenses in 2022 compared to 2021.
- **Offences Against the State:**
 - Offences against the State exhibited a slight increase in 2022 compared to the previous year.

- There was approximately a 25% rise in cases registered under the **Unlawful Activities Prevention Act (UAPA)** during this period.
- Conversely, cases under the **sedition Section** of the **IPC** experienced a significant decline.
 - The decrease in sedition cases may be attributed to the **Supreme Court's** decision in May 2022 to keep sedition cases in abeyance (hold).
- **Rise in Economic Offences:**
 - Economic offences are categorized into **criminal breach of trust, forgery, cheating, fraud (FCF), and counterfeiting**.
 - **FCF accounted for the majority of cases** (1,70,901 cases), followed by criminal breach of trust (21,814 cases) and counterfeiting (670 cases).
 - The Crime in India report disclosed that government authorities confiscated **fake Indian currency notes (FICN)** totaling over Rs.342 crore in 2022.
- **Crimes Against Foreigners:**
 - 192 cases registered against foreigners, a **28% increase from 150 cases in 2021**.
 - 56.8% of victims were from the Asian continent, while 18% were from African countries.
- **High Chargesheeting Rates:**
 - States with the **highest charge sheeting rates under IPC crimes are Kerala, Puducherry, and West Bengal**.
 - Chargesheeting rate reflects cases where police reached the stage of framing charges against the accused, out of the total true cases (where a charge sheet was not laid but a final report submitted as true, plus the total cases charge-sheeted).

What is the National Crime Records Bureau?

- NCRB was set up in 1986 to function as a **repository of information on crime and criminals** to assist the investigators in linking the crime to the perpetrators based on the recommendations of the **Tandon Committee, National Police Commission (1977-1981) and the Ministry of Home Affairs (MHA) Taskforce (1985)**.
 - It is part of the **MHA and is headquartered in New Delhi**.
- It also acts as a **“national warehouse” for the fingerprint records** of Indian and foreign criminals, and assists in locating interstate criminals through fingerprint search.
- The NCRB has four divisions: Crime and Criminal Tracking Network and Systems (CCTNS), Crime Statistics, Finger Prints, and Training.
- **NCRB Publications:**
 - **Crimes in India, Accidental Deaths and Suicides, Prison Statistics, and Reports on Missing Women and children in India**.
 - These publications serve as principal reference points on crime statistics not only for police officers but also for criminologists, researchers, media and policymakers not only in India but abroad as well.

4. Section 6A of the Citizenship Act, 1955

Why in News?

Recently, a **Constitution Bench** led by the **Chief Justice of India** is hearing a series of petitions challenging the **constitutionality of Section 6A of the Citizenship Act, 1955**.

- The Constitution Bench clarifies its focus is limited to examining the validity of Section 6A and not the **Assam National Register of Citizens (NRC)**.

What is Section 6A of the Citizenship Act of 1955?

- **Background:**
 - Section 6A was enacted as part of the **Citizenship (Amendment) Act, 1985**, following the **Assam Accord of 1985**.
 - The Assam Accord was a **tripartite agreement** between the Central Government, the State Government of Assam, and the leaders of the Assam Movement, which sought to end the influx of illegal migrants from Bangladesh.
 - The **Assam Accord, signed in 1985**, introduced Section 6A into the Citizenship Act, of 1955, exclusively for Assam.

- This provision addresses the issue of large-scale migration preceding the **1971 Bangladesh Liberation War**. Notably, it mandates the **detection and deportation of foreigners** who entered Assam after March 25, 1971, marking the creation of Bangladesh.
- The introduction of Section 6A reflects the specific historical and demographic challenges faced by Assam during this critical period.
- **Provisions and implications:**
 - Section 6A created a special provision for Assam by which persons of Indian origin who came from Bangladesh **before 1st January 1966, were deemed to be citizens of India as of that date.**
 - Persons of Indian origin who came to Assam **between 1st January 1966, and 25th March 1971**, and who were detected to be foreigners, were required to register themselves and **were granted citizenship after 10 years of residence**, subject to certain conditions.
 - Persons who entered Assam after 25th March, 1971, were to be detected and deported in accordance with the law.
- **Challenges:**
 - **Constitutional Validity:**
 - Article 6:
 - The petitioners argue that Section 6A is in violation of Article 6 of the Constitution.
 - **Article 6 of the Indian Constitution** deals with the citizenship of people who migrated from Pakistan to India during the partition.
 - The article states that **anyone who migrated to India before 19th July 1949, would automatically become an Indian citizen** if either of their parents or grandparents was born in India.
 - This raises concerns about the legal and constitutional validity of the provision.
 - **Article 14:**
 - Critics argue that Section 6A may **violate Article 14 of the Constitution**, which guarantees the **right to equality**.
 - The provision is perceived as discriminatory as it singles out Assam for specific citizenship criteria.
 - The provision is applicable only to Assam, and this selective application raises concerns about equal treatment and fairness compared to other states facing similar issues of migration.
 - **Demographic Impact:**
 - Section 6A's citizenship grant is criticized by some petitioners for **allegedly contributing to an influx of illegal migrants** from Bangladesh into Assam.
 - Concerns focus on the unintended consequence of encouraging illegal migration and the **resultant impact on the state's demographic composition**.
 - The petitioners argue that the conferring of citizenship on the migrant population in Assam, as facilitated by Section 6A, amounts to "**cementing an illegality**."
 - They claim that the provision has had a multiplier effect by recognizing these individuals as citizens, leading to continued influx.
 - **Cultural Impact:**
 - Petitioners argue that the benefits given to cross-border migrants between 1966 and 1971 led to a radical demographic change affecting the cultural identity of Assam.

What is Citizenship?

- **About:**
 - Citizenship is the **legal status and relationship between an individual and a state** that entails specific rights and duties.
- **Constitutional Provisions:**
 - **Articles 5 to 11 in Part II of the Constitution of India** deal with the aspects of citizenship, such as acquisition of citizenship by **birth, descent, naturalization, registration, and** relinquishment of Citizenship by **renunciation, and termination**.
 - Citizenship is listed in the **Union List** under the Constitution and thus is under the **exclusive jurisdiction of Parliament**.
- **Citizenship Act:**
 - The Parliament has enacted the Citizenship Act, 1955 to regulate the matters of citizenship in India.
 - The Citizenship Act, 1955 has been **amended six times since its enactment**. The amendments were made in the years **1986, 1992, 2003, 2005, 2015, and 2019**.

- The latest **amendment was made in 2019**, which granted **citizenship to certain illegal migrants belonging to Hindu, Sikh, Buddhist, Jain, Parsi, and Christian** communities from **Afghanistan, Bangladesh, and Pakistan**, who entered India on or before 31st December 2014.

5. PM-JANMAN Scheme

Why in News?

Recently, the Ministry of Tribal Affairs has brought to light the ambitious **Pradhan Mantri-Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) Scheme**. Aimed at uplifting **Particularly Vulnerable Tribal Groups (PVTGs)**, this initiative carries the potential to address their unique challenges and provide essential infrastructure for a brighter future.

What is the PM-JANMAN Scheme?

▪ About:

- PM JANMAN is a government scheme that aims to **bring tribal communities into the mainstream**.
- The scheme (comprising Central Sector and Centrally Sponsored Schemes) will be implemented by the Ministry of Tribal Affairs, in collaboration with the State governments and the PVTG communities.
- The scheme will **concentrate on 11 critical interventions overseen by 9 line Ministries**, ensuring the implementation of existing schemes in villages inhabited by PVTGs.
 - It encompasses various sectors, including safe housing under the **PM-AWAS Scheme**, access to **clean drinking water**, improved **healthcare, education, nutrition**, road and telecommunications connectivity, as well as opportunities for sustainable livelihoods.
- The plan also includes the establishment of **Van Dhan Vikas Kendras** for **trading in forest produce**, off-grid solar power systems for 1 lakh households, and solar street lights.
- The scheme is expected to **enhance the quality of life and well-being of the PVTGs**, by addressing their multiple and intersecting forms of **discrimination and exclusion**, and by recognizing and valuing their unique and valuable contribution to national and global development.

▪ Challenges in Implementation:

- Lack of current data on PVTGs is a significant challenge, as the last available census data for PVTGs is from 2001, which counted a total of around 27.6 lakh individuals belonging to these communities.
 - The Ministry of Tribal Affairs has started conducting baseline surveys, but an accurate and current dataset of PVTG populations is yet to be compiled.
 - The population data submitted to the **Parliamentary Standing Committee** on Social Justice and Empowerment in 2022 was based on the **2011 Census** and **did not include the population of PVTGs in Maharashtra, Manipur, and Rajasthan**.
 - The lack of current data hampers the accurate assessment of the needs and progress of PVTG communities.
 - The absence of a specific Census for PVTG communities, as recommended by the **National Advisory Council in 2013**, further adds to the challenge of gathering comprehensive information on their education, health, and housing status.
- The complexity and diversity of the needs and capacities of the PVTGs across different regions and states and the **need for customized and flexible approaches and interventions**.
- The stigma and discrimination faced by the PVTGs in mainstream society and the state and the **need for sensitization and awareness** among the stakeholders and the public.
- The coordination and convergence of the scheme with the existing schemes and programmes of the central and state governments and the need for effective and efficient delivery and utilization of the resources and services.

Who are Particularly Vulnerable Tribal Groups (PVTGs)?

- In 1973, the **Dhebar Commission** established **Primitive Tribal Groups (PTGs)** as a distinct category, encompassing tribal communities characterized by a declining or stagnant population, the use of **pre-agrarian technology, economic backwardness, and low literacy**.
 - These groups are identified as **less developed among the tribal communities**.
- In 2006, the Government of India renamed the PTGs as PVTGs. They reside in remote and inaccessible areas, facing challenges due to poor infrastructure and administrative support.
- There are 75 PVTG communities spread across 18 States and Union Territories in India.

- **Odisha has the highest number of PVTGs (15)**, followed by **Andhra Pradesh (12)**, Bihar and Jharkhand (9), Madhya Pradesh and Chhattisgarh (7), Tamil Nadu (6), and Kerala and Gujarat (5 each).
- The rest of the communities are spread across Maharashtra, West Bengal, Karnataka, Uttarakhand, Rajasthan, Tripura, and Manipur.
- **All four tribal groups in the Andaman and one in the Nicobar Islands are recognized as PVTGs.**

Other Initiatives for PVTGs

- Janjatiya Gaurav Divas.
- Viksit Bharat Sankalp Yatra.
- PM PVTG Mission.

6. SC Verdict on Revocation of Article 370

Why in News?

Recently, The **Supreme Court** gave its verdict on the Union government's **2019 move to amend Article 370 of the Constitution**. The abrogation had ended the **special status** conferred to the erstwhile state of Jammu and Kashmir. **The court held the Constitutional order that revoked Article 370 as valid.**

What is the Recent Judgement of the Supreme Court?

- **Jammu and Kashmir did not Possess Sovereignty:**
 - SC observed that there is much evidence in Article 370 and the J&K Constitution to show that in regards to Kashmir, a merger agreement was not necessary to surrender its sovereignty.
 - **Article 370(1) applied Article 1** of the Constitution of India (where J&K was listed as a Part III State) with no modifications.
 - **Section 3** of the J&K Constitution explicitly states that **"the State of Jammu and Kashmir is and shall be an integral part of the Union of India."**
 - **Section 147 of the Indian constitution prohibited any amendments to Section 3**, further making the provision absolute.
 - Thus, Court said that the Constitution of India, **"became the supreme governing document of the land."** Further, the Preamble to the J&K Constitution shows a **"clear absence of...a reference to sovereignty."**
- **Article 370 is a Temporary Provision:**
 - The SC relied on the fact that the Constitution framers placed **Article 370 with the temporary and transitional provisions contained in Part XXI.**
 - Then, it pointed out that the **Instrument of Accession (IoA)** made it "abundantly clear" that Article 1 which stated that **"India that is Bharat shall be a Union of States"** applied in its entirety to J&K.
- **Constitutional Validity of Proclamations Under President's Rule:**
 - SC's Bench concurred that the President has the power to make **"irreversible changes, including the dissolution of the State Assembly,"** and that the President's powers are kept in check by **"judicial and constitutional scrutiny."**
- **The Constitution of J&K Stands Inoperative:**
 - Court held that it is no longer necessary for the Constitution of J&K through which only certain provisions of the Indian Constitution applied to J&K, to exist.
 - The implicit but necessary consequence of the application of the Constitution of India in its entirety to the State of Jammu and Kashmir is that the Constitution of the State is inoperative.
- **Set up a Truth and Reconciliation Commission to Address Human Rights:**
 - The SC recommended that the Union set up a **"truth and reconciliation Commission"** just like South Africa did **post-apartheid** to investigate human rights violations by both state and non-state actors. **The exercise should be time-bound.**

What was the Special Status of J&K?

- **About:**
 - **On 5th August 2019**, the **President of India** in the exercise of the powers conferred by Article 370(1) of the Constitution issued the **Constitution (Application to Jammu and Kashmir) Order, 2019.**

- Through this, the Government of India has **made modifications to Article 370 itself (not revoked it)**.
- With this, the Government of India has dramatically altered the relationship between the state of Jammu and Kashmir and the Indian Union.
- **Background:**
 - On 17th October 1949, Article 370 was added to the Indian constitution, as a '**temporary provision**', which exempted Jammu & Kashmir, permitting it to draft its own Constitution and restricting the Indian Parliament's legislative powers in the state.
 - It was introduced into the draft constitution by N Gopalaswami Ayyangar as Article 306 A.
- **Article 370:**
 - The **Constituent Assembly of Jammu & Kashmir** was empowered to recommend which articles of the Indian Constitution should apply to the state.
 - The J&K Constituent Assembly was dissolved after it drafted the state's constitution. **Clause 3 of Article 370 gives the President of India the power to amend its provisions and scope.**
 - **Article 35A** stems from Article 370 and was introduced through a Presidential Order in 1954, on the recommendation of the J&K Constituent Assembly.
 - Article 35A empowers the Jammu & Kashmir legislature to define the **permanent residents of the state, and their special rights and privileges.**
 - It appears in Appendix I of the Constitution of India.
 - Several states have different constitutional guarantees. **These are codified in Articles 371, 371A- I** for states including Andhra Pradesh, Maharashtra, Gujarat, and those in the North East.

Note

For the rest of India, the Constitution lays down an elaborate procedure in **Article 367 to enlarge or curb state power through a constitutional amendment**. However, for J&K, the Constitution provides that a mere executive action under Article 370 would suffice.

What are the Key Changes Brought Out by the Order of 2019?

- **Constitution (Application to Jammu and Kashmir) Order, 2019:**
 - The Constitution (Application to Jammu and Kashmir) Order, 2019 has replaced the **Presidential Order of 1954**.
 - Subsequently, the **Jammu and Kashmir Reorganisation Bill, 2019**, passed by Parliament divides the state of Jammu and Kashmir into two new Union Territories (UTs): Jammu & Kashmir, and Ladakh.
 - This is the **first time that a state has been converted into UTs**.
 - Of the six Lok Sabha seats currently with the state of Jammu and Kashmir, five will remain with the union territory of Jammu and Kashmir, while one will be allotted to Ladakh.
 - The **UT of Jammu and Kashmir** will have an Assembly, like in Delhi and Puducherry.
 - Ladakh will be a UT without legislature
 - Kashmir will no longer have a Governor, but rather a **Lieutenant Governor** like in Delhi or Puducherry.
- **Status of J&K Union Territory:**
 - J&K Assembly will have a five-year term, not six, as was the earlier case.
 - Section 32 of the J&K 2019 Bill proposes that the Assembly **can make laws on any subjects in the State and Concurrent lists except on state subjects relating to "public order" and "police"**.
 - This is similar to **Article 239A of the Constitution** that is applicable to Union Territories of Puducherry and Delhi.
 - However, by insertion of **Article 239AA** and by virtue of the **69th Constitutional Amendment**, the Delhi Assembly cannot legislate on matters in entry 18 of the State List, i.e. land.
 - In the case of J&K, the Assembly can make laws on land.
- **The Special Status of J&K Abolished:**
 - Jammu & Kashmir **will no longer have the separate constitution, flag or anthem.**
 - The citizens of Jammu and Kashmir will not have dual citizenship.



- As the new union territory of Jammu and Kashmir will be subject to the Indian Constitution, its citizens will now have the Fundamental Rights enshrined in the Indian constitution.
- **Article 360**, which can be used to declare a Financial Emergency, will **now also be applicable**.
- All laws passed by Parliament will be applicable in Jammu and Kashmir, including the **Right to Information Act and the Right to Education Act**.
- The **Indian Penal Code will replace the Ranbir Penal Code** of Jammu and Kashmir.
- **Article 35A, which originates from the provisions of Article 370 stands null and void.**

Note

J&K historically had a unique relationship with the Union. There was no merger agreement between J&K and the Union, **but only the Instrument of Accession (IoA)**. Hence there is no transfer of sovereignty, and the state's autonomy has to be maintained. The IoA deals with external sovereignty. External sovereignty is lost with a few exceptions here and there. **CJI in recent judgement said that J&K has no internal sovereignty after the signing of IoA.**

What were the Different Legal Challenges in Abrogation of Article 370?

- **Constitutional Challenges:**
 - Presidential order that sought to abrogate Jammu and Kashmir's special status, according to **Article 370 (3) the President would require the recommendation of the constituent assembly of Jammu and Kashmir** to make such a change.
 - However, the **2019 Presidential order adds a sub-clause to Article 367**, replacing the terms:
 - "Constituent Assembly of Jammu and Kashmir" to mean "legislative Assembly of Jammu and Kashmir".
 - "Government of Jammu and Kashmir" to mean "Governor of Jammu and Kashmir acting on the aid and advice of the council of ministers".
 - The government **sought to dilute the autonomy under Article 370 without bringing a Constitutional Amendment** that would require a two-thirds majority in the Parliament.
 - This provision **was challenged in the Supreme Court on the ground that it added article 35A to the Indian Constitution only through a Presidential Order.**
 - Conversion of Jammu and Kashmir into a Union Territory **is in violation of Article 3, as the Bill was not referred to the President by the State Assembly.**
 - In the reorganisation of the state, **the Presidential order also requires the concurrence of the government of the state.** However, since Jammu & Kashmir is currently under the Governor's rule, the Governor's concurrence is deemed to be the government's concurrence.
- **Federalism Issue:**
 - The Instrument of Accession was **like a treaty between two sovereign countries** that had decided to work together.
 - In **Santosh Kumar v. State of J&K & ors, 2017**, the SC said that due to historical reasons, Jammu and Kashmir had a special status.
 - In **SBI v Zaffar Ullah Nehru, 2016**, the SC held that Article 370 cannot be repealed without the concurrence of the Constituent Assembly of Jammu and Kashmir.

What are the Signs of Peace and Security in J&K After the Abrogation of Article 370?

- **Reduction in Stone Pelting and Militancy:**
 - Increased security presence and action by central agencies like the **National Investigation Agency (NIA)** led to decrease in the cases of stone pelting.
 - The number of stone-pelting incidents decreased from 618 in 2019 to 222 in 2020.
 - Injuries to security forces decreased from 64 in 2019 to 10 in 2021.
- **Reduction in Civilian Injuries:**
 - Civilian Injuries from pellet guns and baton charges reduced from 339 (2019) to 25 (2021).

- Law and Order also improved in J&K as only 20 law and order incidents were reported in 2022.
- **Arrests of Militants and Over-Ground Workers (OGWs):**
 - Arrests of OGWs of militant groups increased from 82 in 2019 to 178 in 2021.
 - There has been a 32% decline in terrorist acts from August 2019 to June 2022, compared to the preceding 10 months.

FEWER INJURIES, DEATHS AMONG SECURITY FORCES		
Incidents	52 months before Aug 5, 2019	52 months after Aug 5, 2019
Terrorist-initiated incidents	765	455
Attacks on civilians	193	156
Civilian casualties	234	131
Civilians injured	1,300	422
Encounters	390	338
Security forces injured	1,098	334
Security forces killed	355	125

How did the International Community Respond to the Abrogation of Article 370?

- **Pakistan and the Muslim World:**
 - Pakistan refused to acknowledge the supremacy of the Indian Constitution over Jammu and Kashmir.
 - The **Organisation of Islamic Cooperation (OIC)** reiterated its call to reverse “all illegal and unilateral measures taken since 5th August 2019 aimed at changing the internationally recognised disputed status of the territory”.
- **China:**
 - China said that it did not recognise the “so-called union territory of Ladakh set up unilaterally and illegally by India”, and the western section of the China-India border has always belonged to China.
- **United States:**
 - It expressed concern over detentions and restrictions in J&K, but also called on all parties to maintain peace and stability along the **Line of Control**, including “taking firm and resolute steps” to combat cross-border terrorism.
- **European Union:**
 - It called on India and Pakistan to reopen dialogue, and reiterated the grouping’s backing for a bilateral solution on Kashmir.
- **Russia:**
 - Russia underlined that the changes were carried out “within the framework of the Constitution of the Republic of India”. Moscow also stressed the “bilateral” nature of the J&K issue and mentioned the **Simla Agreement (1972)** and **Lahore Declaration (1999)**.

Way Forward

- A **10-year strategy for 3Es (education, employment and employability)** should be deployed for uplifting Kashmir.
- The plan for a ‘**zero-terror incident**’ in J&K has been in force since 2020 and will be successful by 2026.
- The **Gandhian path of non-violence and peace** should be adopted to solve the legitimacy crisis in Kashmir.
- The government can mitigate the challenges emanating out of Action on article 370 by launching a **comprehensive outreach programme to all Kashmiris**.
- In this context, Atal Bihari Vajpayee's version of **Kashmiriyat, Insaniyat, and Jamhooriyat (inclusivity culture of Kashmir, humanitarianism and democracy)** for Kashmir solution, should become a cornerstone of the forces of reconciliation in the State.

7. 28th Conference of Parties To the UNFCCC

Why in News?

Recently, the **28th Conference of Parties (COP28)** to the **United Nations Framework Convention on Climate Change (UNFCCC)** was held in **Dubai, United Arab Emirates**.

What are the Key Highlights of the COP28?

- **Loss and Damage (L&D) Fund:**
 - COP28, member countries reached an agreement to operationalize the **Loss and Damage (L&D)** fund aimed at compensating countries grappling with climate change impacts.
 - The **World Bank** will be the "interim host" of the fund for four years, aligning with UNFCCC and the **Paris Agreement**.
 - All developing countries are eligible to apply, and every country is "invited" to contribute voluntarily.

- A specific percentage is earmarked for **Least Developed Countries and Small Island Developing States**.
- **Global Stocktake Text:**
 - The **Global Stocktake (GST)** is a periodic review mechanism established under the **Paris Agreement in 2015**.
 - The fifth iteration of the **Global Stocktake (GST) text** was released at COP28 and adopted with no objection.
 - The text proposes eight steps to keep the global temperature rise within the ambit of 1.5 degrees Celsius:
 - **Tripling renewable energy capacity** globally and doubling the global average annual rate of energy efficiency improvements by 2030;
 - Accelerating efforts towards the phase-down of unabated coal power;
 - Accelerating efforts globally **towards net zero emissions energy** systems, utilizing zero and low carbon fuels well before or by around mid-century;
 - Accelerating **zero and low emissions technologies**, including, inter alia, renewables, nuclear, abatement and removal technologies, including such as **carbon capture** and utilization and storage, and low carbon **hydrogen production**, to enhance efforts towards substitution of unabated fossil fuels in energy systems.
 - Transitioning away from **fossil fuels** in energy systems, in a just, **orderly and equitable manner**, accelerating action in this critical decade, so as to achieve **net zero by 2050 in keeping with the science**;
 - Accelerating and substantially **reducing non-CO₂ emissions**, including, in particular, methane emissions globally by 2030;
 - Accelerating **emissions reductions from road transport** through a range of pathways, including development of infrastructure and rapid deployment of zero and low emission vehicles;
 - **Phasing out of inefficient fossil fuel** subsidies that encourage wasteful consumption and do not address energy poverty or just transitions, as soon as possible.
 - The fifth iteration text maintains continuity with **COP26 in Glasgow**, balancing global aspirations of countries like India with diverse energy needs.
 - India argues that it needs to **continue using coal to meet its developmental needs** and emphasizes the importance of adhering to **nationally determined contributions (NDCs)**.
 - Nearly 200 countries agreed to "**transition away from fossil fuels in energy systems**" at the COP28.
 - The agreement is the first time countries have made this pledge. The deal aims to signal to **policymakers and investors** that the world is **committed to breaking away from fossil fuels**.
 - Developing and poor countries are **expressing dissatisfaction with the latest draft of the Global Stocktake (GST) at COP28**, calling for significant changes.
 - Several countries, including India, are extremely opposed to any mandate to cut **methane emissions**, mainly because one of the major sources happens to be **agriculture and livestock**.
 - Cutting methane emissions could involve tweaking agricultural patterns which could be **extremely sensitive in a country like India**.
 - Possibly in deference to the concerns of such countries, the **agreement does not mention any targets for methane emission** cuts for the year 2030, although a group of about 100 countries had made a voluntary commitment, in **Glasgow in 2021**, to reduce their methane emissions by **30% by 2030**.
 - This pledge is known as the **Global Methane Pledge**. However, **India is not a part of the Global Methane Pledge**.
 - Developing countries call on rich nations to achieve negative carbon emissions, not just reaching net zero by 2050. They emphasize principles of **common but differentiated responsibilities and respective capabilities (CBDR-RC)** in combating climate change.
 - Developing countries argue that rich nations, having consumed over **80% of the global carbon budget**, should allow developing nations their fair share of future emissions.
- **Global Renewables and Energy Efficiency Pledge:**
 - The Pledge stipulates that signatories commit to work together to **triple the world's installed renewable energy generation capacity** to at least **11,000 GW by 2030** and to collectively double the **global average annual rate of energy efficiency** improvements from around 2% to over 4% every year until 2030.
- **The Global Cooling Pledge for COP 28:**
 - It includes 66 national government signatories committed to working together to reduce **cooling-related emissions** across all sectors by at least 68% globally relative to 2022 levels by 2050.
- **Climate Finance:**
 - **The United Nations Conference on Trade and Development (UNCTAD)** estimates that wealthy nations owe developing countries USD 500 billion in 2025 under the **New Collective Quantified Goal (NCQG) for climate finance**.
 - The NCQG was confirmed by developed countries under the **Paris Agreement in 2015**.

- The goal is to set a new collective quantified goal before 2025. The goal will start from a floor of USD 100 billion per year.
- This includes USD 250 billion for mitigation, USD 100 billion for adaptation, and USD 150 billion for loss and damage.
- The figure is expected to increase to USD 1.55 trillion by 2030.
- The current climate finance goal of USD 100 billion per year has not been met, and developing countries are facing debt distress.
- Experts call for reform of the global financial architecture to address structural issues and promote sustainable development.
- **Global Goal on Adaptation (GGA):**
 - The draft text on the Global Goal on Adaptation (GGA) was introduced. It was established under the **Paris Agreement to enhance climate change adaptation** by increasing awareness of and funding towards countries' adaptation needs in the context of the **1.5/2°C** goal of the Paris Agreement.
 - The draft text addresses critical issues:
 - Climate-Induced Water Scarcity Reduction.
 - Climate-resilient food and Agriculture Production.
 - Strengthening Resilience Against Climate-Related Health Impacts.
- **Declaration to Triple Nuclear Energy:**
 - The declaration launched at COP28 aims to **triple global nuclear energy capacity by 2050**.
 - Endorsed by 22 national governments, the declaration calls for support from shareholders of international financial institutions. It encourages shareholders to **advocate for the incorporation of nuclear energy in energy lending policies**.
- **Powering Past Coal Alliance (PPCA):**
 - PPCA is a coalition of national and sub-national governments, businesses and organizations working to advance the transition from **unabated coal power generation to clean energy**.
 - PPCA at COP28 welcomed new national and subnational governments, and called for cleaner energy alternatives.
- **Coal Transition Accelerator:**
 - France, in collaboration with various countries and organizations, introduced the Coal Transition Accelerator.
 - Objectives include **knowledge-sharing, policy design**, and financial support to facilitate just transitions from coal to clean energy.
 - The initiative aims to leverage best practices and lessons learned for effective coal transition policies.
- **Coalition for High Ambition Multilevel Partnership (CHAMP) for Climate Action:**
 - A total of 65 national governments signed CHAMP commitments to enhance cooperation, where applicable and appropriate, with subnational governments in the planning, financing, implementation, and monitoring of climate strategies.
- **India Led Initiatives at COP28:**
 - **Global River Cities Alliance (GRCA):**
 - It was launched at COP 28, led by the **National Mission for Clean Ganga (NMCG)** under the **Ministry of Jal Shakti**, Government of India.
 - The GRCA is a unique alliance covering 275+ global river-cities in 11 countries.
 - Partner countries include Egypt, Netherlands, Denmark, Ghana, Australia, Bhutan, Cambodia, Japan and river-cities of The Hague (Den Haag) from the Netherlands, Adelaide from Australia, and Szolnok of Hungary.
 - GRCA highlights **India's role in sustainable river-centric development** and climate resilience.
 - The GRCA platform will facilitate knowledge exchange, river-city twinning, and dissemination of best practices.
 - **Green Credit Initiative:**
 - India launched the Green Credit Initiative here at COP28, to create a participatory **global platform for exchange of innovative environmental programs and instruments**.
 - There are two main priorities of the initiative are **water conservation and afforestation**.
 - The main purpose of this initiative is to **boost voluntary environmental activities** like tree plantation, water conservation, **sustainable agriculture**, and **waste management by incentivizing** it for big corporations and private companies, bringing about a change in the **climate issues** faced by the country.

8. Regional Overview of Food Security and Nutrition 2023

Why in News?

Recently, the **Food and Agriculture Organisation (FAO)** of the United Nations has launched the **Asia-Pacific Regional Overview of Food Security and Nutrition 2023: Statistics and Trends**, which said 74.1% of Indians were unable to afford a healthy diet in 2021.

What are the Key Highlights of the Report?

- **Global:**
 - The prevalence of undernourishment in the Asia and the Pacific region decreased to 8.4% in 2022 from 8.8% of the previous year, equivalent to around 12 million fewer undernourished people than in 2021, but 55 million more than in 2019, prior to the Covid-19 pandemic.
 - With 370.7 million undernourished people, the Asia and the Pacific region represents **half of the world's undernourished people**.
 - Southern Asia accounts for **almost 314 million of the region's undernourished people**. This represents 85 % of undernourished people in the Asia and the Pacific region.
 - There are more **severely food insecure individuals in Southern Asia** than any other subregions.
 - Women across the subregions, except for Eastern Asia, tend to be more food insecure than men.
- **Indian:**
 - **Inability to Afford Healthy Diet:** 74.1% of Indians were unable to afford a healthy diet in 2021, in 2020, the percentage was 76.2.
 - Comparison with Neighboring Countries: Pakistan had 82.2% and Bangladesh had 66.1% of their populations facing difficulties in accessing healthy food.
 - **Regional Nutrition and Food Security:** 16.6% of India's population is undernourished.
 - India has a **lower prevalence of moderate or severe and severe Food Insecurity** compared to the world since 2015.
 - **Children's Health: Stunting** affected 31.7% of children under five, while wasting (low weight for height) was prevalent in 18.7% of children under five.
 - The WHO global nutrition target for childhood wasting is less than 5%.
 - Stunted growth and **development are the result of poor maternal health** and nutrition, inadequate infant and young child feeding practices, and repeated infections interacting with a variety of other factors over a sustained period.
 - **Women's Health:** 53% of the country's women aged between 15 to 49 had anaemia, which was the largest prevalence rate in India in 2019.
 - Anaemia impairs health and well-being in women and increases the risk for adverse maternal and neonatal outcomes.
 - **Obesity and Nutrition Indicators:** 1.6% of the country's adults are obese as of 2000, according to the FAO. The figure has increased to 3.9% by 2016.
 - **Exclusive Breastfeeding:** On exclusive breastfeeding among infants 0–5 months of age, India has improved the prevalence with a percentage of 63.7%, which is higher than the world prevalence – 47.7%.
 - India has the highest prevalence of **low birthweight in the region (27.4%), followed by Bangladesh and Nepal**.

What is the Food and Agriculture Organization?

- **About:**
 - FAO is a specialised agency of the **United Nations** that leads international efforts to defeat hunger.
 - **World Food Day** is celebrated every year around the world on 16th October. The day is celebrated to mark the anniversary of the founding of the FAO in 1945.
 - It is one of the UN food aid organisations based in Rome (Italy). Its sister bodies are the **World Food Programme** and the International Fund for Agricultural Development (IFAD).
- **Initiatives Taken:**
 - **Globally Important Agricultural Heritage Systems (GIAHS)**.
 - Monitors the Desert Locust situation throughout the world.
 - The **Codex Alimentarius Commission or CAC** is the body responsible for all matters regarding the implementation of the Joint FAO/WHO Food Standards Programme.
 - The **International Treaty on Plant Genetic Resources for Food and Agriculture** was adopted by the Thirty-First Session of the Conference of the FAO in 2001.
- **Flagship Publications:**
 - **The State of World Fisheries and Aquaculture (SOEIA)**

- The State of the World's Forests (SOFO).
- **The State of Food Security and Nutrition in the World (SOFI).**
- The State of Food and Agriculture (SOFA).
- The State of Agricultural Commodity Markets (SOCO).

9. The CEC and Other ECs (Appointment, Conditions of Service and Term of Office) Bill, 2023

Why in News?

The **Rajya Sabha** recently approved the **Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Bill, 2023**, which outlines the procedures for appointing the **Chief Election Commissioner (CEC) and Election Commissioners (EC)**.

- The legislation aims to bring transparency to the appointment process, responding to a **directive from the Supreme Court of India in the Anoop Baranwal v Union of India case, 2023**.

What is the Supreme Court Ruling on the Appointment of CEC and ECs?

- In March 2023, the Supreme Court emphasised the critical role of an **independent Election Commission of India (ECI)** in ensuring free and fair elections, addressing a longstanding legislative gap since the **Constitution's adoption** regarding the appointment of the CEC and ECs.
- The SC drew attention to other institutions supporting constitutional democracy that have independent mechanisms for appointing their heads/members.
 - Mentioned examples such as the **National and State Human Rights Commission, Central Bureau of Investigation (CBI), Information Commission, and Lokpal**.
- The SC noted recommendations from the **Dinesh Goswami Committee on Electoral Reforms (1990)** and the **Law Commission's 255th report on Electoral Reforms (2015)**.
 - Both committees suggested a committee comprising the **Prime Minister, Chief Justice of India (CJI), and the Leader of the Opposition** for appointing the CEC and ECs.
- The SC, using its powers under **Article 142 (to issue directions for doing 'complete justice' in any matter)**, laid down that the CEC and ECs shall be appointed by a committee consisting of the **Prime Minister, the CJI and the Leader of the Opposition or the largest opposition party in the Lok Sabha**.
 - SC ruled that this mechanism shall be in place till Parliament enacts a law on this matter.

What are the Key Provisions of the Bill?

- The **Bill replaces the Election Commission (Conditions of Service of Election Commissioners and Transaction of Business) Act, 1991**.
- It addresses the appointment, salary, and removal of the CEC and ECs.
 - **Appointment Process:**
 - The CEC and ECs will be **appointed by the President** upon the recommendation of a **Selection Committee**.
 - The Selection Committee will consist of the **Prime Minister, a Union Cabinet Minister, and the Leader of Opposition/leader** of the largest opposition party in **Lok Sabha**.
 - Recommendations of the Selection Committee will be valid **even when there is a vacancy in this Committee**.
 - A Search Committee headed by the **Cabinet Secretary** will propose a panel of names to the Selection Committee.
 - Eligibility for the posts includes holding (or having held) a post equivalent to the **Secretary to the central government**.
 - **Changes in Salary and Conditions:**
 - The salary and conditions of service of the CEC and ECs will be equivalent to that of the **Cabinet Secretary**.
 - Under the 1991 Act, it was equivalent to the salary of a **Supreme Court Judge**.
 - **Removal Process:**
 - The Bill retains the constitutional provision (**Article 324(5)**) that allows the CEC to be removed like a Supreme Court Judge, while ECs can only be removed on the recommendation of the CEC.
 - **Protection for CEC And ECs:**
 - Bill safeguards CEC and ECs from **legal proceedings related to actions taken during their tenure**, provided such actions were carried out in the discharge of official duties.

- The amendment aimed to shield these officials from civil or criminal proceedings related to their official functions.

How are the CEC and ECs Currently Appointed?

- **Constitutional Provisions:**
 - There are just five **Articles (324-329) in Part XV (Elections)** of the Constitution.
 - The Constitution does not lay down a specific legislative process for the appointment of the CEC and ECs.
 - Article 324 of the Constitution vests the **“superintendence, direction and control of elections”** in an Election Commission consisting “of the Chief Election Commissioner and such number of other Election Commissioners, if any, as the President may from time to time fix”.
 - The President makes the appointment on the advice of the Union Council of Ministers headed by the Prime Minister.
 - The Law Minister suggests a pool of suitable candidates to the Prime Minister for consideration. The President makes the appointment on the advice of the PM.
- **Removal:**
 - They can resign anytime or can also be removed before the expiry of their term.
 - The CEC can be removed from office only through a process of removal similar to that of a SC judge by Parliament.
 - Any other EC cannot be removed except on the recommendation of CEC.

What are the Concerns Regarding the Bill?

- **Transparency and Independence:**
 - Allowing the Selection Committee's recommendations to be valid even with a vacancy could result in a **monopoly of ruling party members** during certain circumstances, undermining the diversity and independence of the committee.
- **Shift from Judicial Benchmark to Executive Control:**
 - Equating the salary of the CEC and ECs with that of the **Cabinet Secretary**, whose salary is determined by the executive, raises concerns about **potential government influence**.
 - Unlike the salary of a Supreme Court Judge, which is fixed by an Act of Parliament, this shift may compromise the **financial independence of the EC**.
- **Limiting Eligibility to Civil Servants:**
 - Restricting eligibility to individuals who have held a position equivalent to the Secretary to the government **may exclude potentially qualified candidates**, limiting the diversity of backgrounds and expertise in the ECI.
- **Concerns About Lack of Parity:**
 - The Bill retains the constitutional provision that allows the CEC to be removed like a Supreme Court Judge, while ECs can only be removed on the recommendation of the CEC.
 - This **lack of parity in removal processes** may raise questions about fairness.

Global Practices in the Appointment of Electoral Body Members

- **South African Model:**
 - In South Africa, the selection process involves key figures such as the **President of the Constitutional Court, representatives of the Human Rights Court, and advocates for gender equality**.
 - Emphasis on diverse representation ensures a broader perspective in the electoral body.
- **United Kingdom Approach:**
 - In the U.K., **candidates for the electoral body are subject to approval by the House of Commons**.
 - Parliamentary involvement adds a layer of scrutiny and accountability to the selection process.
- **United States Procedure:**
 - In the U.S., the **President appoints members to the electoral body, and the appointments require confirmation by the Senate**.
 - The dual-check system ensures a balance of power and prevents unilateral decisions.

10. India-Oman Bilateral Meet

Why in News?

Recently, India and Oman have adopted the India **Oman Joint Vision Partnership For the Future**, setting the stage for bilateral cooperation and charting pathways for **future collaboration between the two countries**.

- This Vision Document focuses on building partnerships in broadly 8 to 10 areas. These include maritime cooperation and connectivity, energy security, space, digital payments, health, tourism, hospitality, agriculture and food security.

What are the Key Highlights of the Bilateral Meet?

- **Bilateral Agreements:**
 - Both countries have signed agreements on cooperation in the field of information technology, combating financial crimes, culture, and the establishment of a Hindi chair of the **Indian Council of Cultural Relations (ICCR)** in Oman.
- **Comprehensive Economic Partnership Agreement (CEPA):**
 - Both nations are engaged in discussions to finalize a **CEPA**. Substantial progress has been made, and leaders from both sides emphasized concluding this agreement at the earliest to boost economic ties.
- **Oman-India investment Fund:**
 - The two sides announced the **third tranche of Oman-India investment fund** worth USD 300 million that would be used for channelising investment into the fastest growing sectors of the Indian economy.
 - The fund was started as a **50:50 joint venture between the SBI and the Oman investment authority**, with the first tranche of USD 100 million followed by USD 200 million.
- **Digital Payments and Trade:**
 - Discussions revolved around the possibility of using India's digital payment system, **UPI (Unified Payments Interface)**, in collaboration with an Omani platform.
 - Additionally, exploring the potential of conducting trade in Rupees was considered, although it's still in the exploratory stage.
- **Regional and International Issues:**
 - Leaders exchanged perspectives on regional and global matters, including the ongoing conflict between **Hamas and Israel**.
 - They discussed the challenge of terrorism and advocated for a two-state solution to address the Palestine issue.

How have Been India-Oman Relationships so Far?

- **Background:**
 - The two countries **across the Arabian Sea are linked by geography, history and culture** and enjoy warm and cordial relations, which are attributed to historical maritime trade linkages.
 - The Sultanate of Oman is a strategic partner of India in the Gulf and an important interlocutor at the **Gulf Cooperation Council (GCC), Arab League and Indian Ocean Rim Association (IORA) fora**.
 - **Gandhi Peace Prize 2019** was conferred on Late HM Sultan Qaboos in recognition of his leadership in strengthening the ties between India & Oman and his efforts to promote peace in the **Gulf region**.
- **Defense Relations:**
 - **Joint Military Cooperation Committee (JMCC):**
 - The JMCC is the highest forum of engagement between India and Oman in the field of defence.
 - The JMCC is expected to meet annually, but could not be organised since 2018 when the meeting of the 9th JMCC was held in Oman.
 - **Military Exercises:**
 - **Army exercise:** Al Najah
 - **Air Force exercise:** Eastern Bridge
 - **Naval Exercise:** Naseem Al Bahr
- **Economic & Commercial Relations:**
 - Institutional mechanisms like Joint Commission Meeting (JCM) and Joint Business Council (JBC) oversee economic cooperation between India and Oman.
 - India is **among Oman's top trading partners**.
 - India is the 2nd largest market for Oman's crude oil exports for the year 2022 after China.
 - India is also the 4th largest market for Oman's non-oil exports for the year 2022 after UAE, US and Saudi Arabia and 2nd largest source of its import after UAE.
 - Indian companies have invested in Oman in sectors like iron and steel, cement, fertilisers, textile etc.

- **India-Oman Joint Investment Fund (OIJIF)**, a JV between State Bank of India and **State General Reserve Fund (SGRF)** of Oman, a special purpose vehicle to invest in India, has been operational.
- **Indian Community in Oman:**
 - There are about 6.2 lakh Indians in Oman, of which about 4.8 lakh are workers and professionals. There are Indian families living in Oman for more than 150-200 years.

What is Oman's Strategic Significance for India?

- Oman is at the **gateway of Strait of Hormuz** through which India imports one-fifth of its oil imports.
- Defence cooperation has emerged as a key pillar for the robust India-Oman strategic partnership. Defence exchanges are guided by a **Framework MOU which was recently renewed in 2021**.
- Oman is the only country in the Gulf region with which all three services of the Indian armed forces conduct regular bilateral exercises and staff talks, enabling close cooperation and trust at the professional level.
- Oman also actively participates in the **Indian Ocean Naval Symposium (IONS)**.
- In a strategic move to expand its footprint in the Indian Ocean region, India has secured access to the key Port of **Duqm** in Oman for military use and logistical support. This is part of India's maritime strategy to counter Chinese influence and activities in the region.
 - The Port of Duqm is situated on the southeastern seaboard of Oman, overlooking the Arabian Sea and the Indian Ocean.
 - It is strategically located, in close proximity to the **Chabahar port in Iran**. With the **Assumption Island** being developed in Seychelles and **Agalega in Mauritius**, Duqm fits into India's proactive maritime security roadmap.

Key Facts About Oman

- **Border Countries:**
 - United Arab Emirates (UAE) to the northwest.
 - Saudi Arabia to the west and southwest.
 - Yemen to the southwest.
- **Deserts:**
 - The largest desert in Oman is the Rub' al Khali or the "Empty Quarter," one of the largest continuous sand deserts in the world.
- **River:**
 - Oman doesn't have perennial rivers; however, during seasonal rains, wadis (seasonal riverbeds) flow with water.
 - The most notable is **Wadi Bani Khalid**, known for its **natural pools** and stunning scenery.
- **Highest Mountain:**
 - Jebel Shams, situated within the Al Hajar mountain range, is the highest mountain in Oman.
- **Geography:**
 - Oman is located on the southeastern coast of the Arabian Peninsula, bordering the Arabian Sea, the Gulf of Oman, and the Persian Gulf.



Way Forward

- India does not have **enough energy resources to serve** its current or future energy requirements. The rapidly growing energy demand has contributed to the need for long term energy partnerships with countries like Oman.
- **Oman's Duqm Port is situated in the middle of international shipping lanes** connecting East with West Asia.
- India needs to engage with Oman and take initiatives to utilise opportunities arising out of the Duqm Port industrial city.
- India should also work closely with Oman to enhance strategic depth in the region and add heft to its **Indo-Pacific vision** in the Western and Southern Part of Indian Ocean.

11. Indian Forest and Wood Certification Scheme

Why in News?

Recently, the Ministry of Environment, Forests and Climate Change (MoEFCC) has launched the **Indian Forest & Wood Certification Scheme (IFWCS)**, offering **voluntary third-party certification** designed to promote sustainable forest management and agroforestry in the country.

What is the Indian Forest & Wood Certification Scheme (IFWCS)?

- **Objective:**
 - IFWCS aims to offer an **alternative to private foreign certification agencies** that have been operating in India. It seeks to ensure greater integrity, transparency, and credibility in certifying sustainable forest management and wood-based products.
- **Certification Scope:**
 - The scheme covers **three main areas for certification**:
 - Sustainable forest management.
 - Sustainable management of trees outside forests (like plantations).
 - Chain of custody, which guarantees the traceability of forest products throughout their supply chain, ensuring ethical sourcing and handling.
- **Nodal Agencies:**
 - The scheme will be overseen by the **Indian Forest and Wood Certification Council**, which will act as a multistakeholder advisory body.
 - **Indian Institute of Forest Management, Bhopal** will act as the scheme operating agency and will be responsible for overall management of the Scheme.
 - The **National Accreditation Board for Certification Bodies under the Quality Council of India** will accredit the certification bodies which will carry out independent audits and assess adherence of various entities on the standards prescribed under the scheme.
- **Trees Outside Forests Standard:**
 - A separate Trees Outside Forests Standard is **now introduced** as a part of the Scheme.
 - ‘Trees outside Forests’ means trees growing outside recorded and notified forests, in farm lands of an individual farmers or group of small farmers or plantation area on private land of institutions and industries, etc. and include all **trees on the hedges and bunds, trees in different models of agroforestry, silvo-pastoralism, urban and rural forestry** systems and block plantations.
- **Benefits:**
 - The certification is expected to enhance trust and transparency in processes related to **forest management and wood-based products**.
 - The IFWCS can provide **market incentives to various entities** that adhere to **responsible forest management** and agroforestry practices in their operations.
 - This includes state forest departments, individual farmers, or **Farmer Producer Organizations** engaged in **agroforestry and farm forestry**, as well as other wood-based industries in the value chain.
- **Global Context:**
 - The launch of IFWCS aligns with global efforts to address deforestation concerns. The scheme's objective resonates with the pledge made by over 100 countries at the **Glasgow climate change conference in 2021** to halt and reverse **Deforestation** by 2030.

What are the Other Recent Announcements Related to Forest Management?

- **National Working Plan Code 2023:**
 - The MoEFCC has released the “National Working Plan Code-2023” for scientific management of forests and evolving new approaches in July 2023.
 - National Working Plan Code which **was first adopted in 2004** with a subsequent amendment in 2014 brought uniformity and acted as the guiding principle for the preparation of the working plan **for scientific management of different forest divisions of our country**.
 - The “**Indian Forest Management Standard (IFMS)**” which is a part of this code, takes into account the diverse forest ecosystem in our country, while trying to bring in uniformity in management.
- **Green Credit Program (GCP) and Ecomark Scheme:**
 - The MoEFCC under **LiFE (Lifestyle for Environment’ movement)**, has introduced the GCP and the Ecomark Scheme in October 2023.
 - **GCP** is an innovative market-based mechanism designed **to incentivize voluntary environmental actions** across diverse sectors, by various stakeholders like individuals, communities, private sector

industries. The **Indian Council of Forestry Research and Education (ICFRE)** serves as the **GCP Administrator**, responsible for program implementation, management, monitoring, and operation.

- **Ecomark Scheme** provides accreditation and labelling for household and consumer products that **meet specific environmental criteria** while maintaining quality standards as per Indian norms.
- The **Central Pollution Control Board** administers the Ecomark Scheme in partnership with **Bureau of Indian Standards (BIS)**, which is the national body for standards and certification.

12. India-US Relations

Why in News?

Recently, the Prime Minister (PM) of India has stated that, despite occasional issues, **India and the US have been on a positive trajectory in relations.**

- The PM emphasized a deepening engagement, understanding, and friendship between the two nations, driven by national interest.

How have been India's Relations with the US?

▪ About:

- The U.S.-India strategic partnership is **founded on shared values including a commitment to democracy** and upholding the rules-based international system.
- Both have shared interests in promoting global security, stability, and economic prosperity through trade, investment, and connectivity.

▪ Economic Relations:

- The U.S. has emerged as India's biggest trading partner in 2022-23 on account of increasing economic ties between the two countries.
- The bilateral trade between India and the U.S. has increased by 7.65% to USD 128.55 in 2022-23 as against **USD 119.5 billion in 2021-22.**
 - Exports to the U.S. rose by 2.81% to USD 78.31 billion in 2022-23 as against USD 76.18 billion in 2021-22, while imports grew by about 16% to USD 50.24 billion.

▪ International Cooperations:

- India and the United States cooperate closely at multilateral organizations, including the **United Nations, G-20, Association of Southeast Asian Nations (ASEAN) Regional Forum, International Monetary Fund, World Bank, and World Trade Organization.**
- The United States welcomed India joining the UN Security Council in 2021 for a two-year term and supports a reformed UN Security Council that includes India as a permanent member.
- India is also one of twelve countries partnering with the United States on the **Indo-Pacific Economic Framework for Prosperity (IPEF).**
- India is a member of the **Indian Ocean Rim Association (IORA)**, at which the United States is a dialogue partner.
- In 2021, the United States joined the International Solar Alliance headquartered in India, and in 2022 the **United States Agency for International Development (USAID).**

▪ Defence Cooperation:

- India has now signed all **four foundational agreements with the US.**
 - The **Logistics Exchange Memorandum of Agreement (LEMOA)** in 2016,
 - the **Communications Compatibility and Security Agreement (COMCASA)** in 2018,
 - The **Basic Exchange and Cooperation Agreement for Geo-Spatial cooperation (BECA)** in 2020.
 - While the **General Security of Military Information Agreement (GSOMIA)** was signed a long time ago, an extension to it, the Industrial Security Annex (ISA), was signed in 2019
- India, which could not access **US weapons during the Cold War**, has bought USD 20 billion worth of arms over the last two decades.
 - However, the incentive for the US is helping India reduce its historical dependence on Russia for its military supplies.
- The armed forces of India and the US engage in extensive bilateral military exercises (**Yuddha Aabyas, Vajra Prahar**) and minilateral ones with the four partners in the **Quad Forum (Malabar).**



- Another grouping in the Middle East - I2U2 involving India, Israel, UAE and the US is being termed as the **new Quad**.
- **Space and Science and Technology:**
 - **Indian Space Research Organization (ISRO)** and US National Aeronautics and Space Administration (NASA) are developing a microwave remote sensing satellite for Earth observation, **NASA-ISRO Synthetic Aperture Radar (NISAR)**.
 - In June 2023 ISRO signed with NASA the **Artemis Accords** to participate in peaceful and sustainable civil exploration of outer space.
 - **iCET** is a joint initiative by the National Security Advisors of the US and India to foster cooperation and innovation in key technology domains such as **AI, quantum, telecom, space, biotech, semiconductors**, and defence. It was launched in January 2023.

What are the Major Challenges between India and the US?

- **US Criticism of India's Foreign Policy:**
 - If the Indian elite has long seen the world through the lens of non-alignment, alliance relationships have been at the heart of US' foreign policy since the **Second World War**.
 - India's policy of nonalignment especially during the Cold War has always been a point of concern for the West, especially the US.
 - After the 9/11 attacks, the US asked India to dispatch troops to Afghanistan; the Indian military vetoed the request.
 - When the US invaded Iraq in 2003, even then India's erstwhile PM withheld military support.
 - Even today, India refuses to toe the American line on the Russian-Ukraine war and its **import of cheap Russian oil** continues to break records.
 - Pro-US voices have often been raised demanding India to get "on the right side of history".
- **India's Engagement with US Adversaries:**
 - India has criticised the US decision to block Iranian and Venezuelan oil from the open market.
 - India has actively worked to **bring Iran into the SCO (Shanghai Cooperation Organization)**.
- **US' Criticism of India's Democracy:**
 - Various US organisations and foundations, from time to time, with the tacit support of some Congressmen and Senators, come out with reports questioning the present state of democratic discourse, press and religious freedom and condition of the minorities in India.
 - Some of them include the **International Religious Freedom Report 2023 and the Human Rights Report on India 2021** by the US State Department.
- **Economic Tensions:**
 - The **Atmanirbhar Bharat Campaign** has exacerbated the view in the US that India is increasingly becoming a protectionist closed market economy.
 - Effective in June 2019, the USA decided to withdraw duty-free benefits to Indian exporters **under the GSP (Generalized System of Preferences) programme** affecting India's export-oriented sectors such as pharma, textiles, agri products and automotive parts.

Way Forward

- The partnership between the two countries is critical for ensuring a free, open, and rules-bound Indo-Pacific region.
- The unparalleled Demographic Dividend provides enormous opportunities for the US and Indian firms for technology transfer, manufacturing, trade and investment.
- India is emerging as a leading player in an international system that is undergoing an unprecedented transformation. It shall use its present situation to explore opportunities to further its vital interests.

13. Parliament Passes Bills To Replace British-era Criminal Laws

Why in News?

The **Parliament** recently passed three pivotal Bills: **Bharatiya Nyaya (Second) Sanhita, 2023; Bharatiya Nagarik Suraksha (Second) Sanhita, 2023; and Bharatiya Sakshya (Second) Bill, 2023.**

- Following their introduction in August, 2023, the bills were referred to a 31-member **Parliamentary Standing Committee**.

What are the Major Provisions of Bharatiya Nyaya (Second) Sanhita, 2023?

The Bharatiya Nyaya Sanhita (Second) (BNS2) replaces the **Indian Penal Code, 1860** and introduces significant alterations including:

- **Retention and Incorporation of Offences:** The BNS2 maintains **existing IPC provisions on murder, assault, and causing hurt**, while incorporating new offenses like organized crime, terrorism, and group-related grievous hurt or murder. It also adds **community service** as a form of punishment.
 - **Terrorism:** Defined as **acts threatening the nation's integrity or causing terror among the populace**. Penalties range from death or life imprisonment to imprisonment with fines.
 - **Organized Crime:** Includes offenses like **kidnapping, extortion, financial scams, cybercrime, and more**. Punishments vary from life imprisonment to death, with fines for those committing or attempting organized crime.
 - **Mob Lynching:** BNS2 identifies **murder or severe injury by five or more individuals on specific grounds** (race, caste, etc.) as a punishable offence, carrying life imprisonment or death penalty.
- **Sexual Offences Against Women:** Retaining IPC sections on **rape, voyeurism, and other violations**, BNS2 raises the **age threshold for gangrape victims from 16 to 18 years**. Additionally, it criminalizes deceptive sexual acts or false promises.
- **Sedition Revisions:** BNS2 **eliminates the sedition offense**, replacing it with penalizing activities related to **secession, armed rebellion, or actions endangering national sovereignty or unity** through various means.
 - However, critics argue that despite the sedition law's alteration from 'rajdroh' to 'deshdroh,' concerns remain over its essence and application.
- **Death by Negligence:** The BNS2 elevates the punishment for causing death by negligence **from two to five years under Section 304A of the IPC**.
 - However, it stipulates that doctors, if convicted, will still face the lower punishment of **two years** imprisonment.
- **Supreme Court Compliance:** Aligns with certain Supreme Court decisions by **excluding adultery as an offense** and introducing life imprisonment alongside the death penalty for murder or attempted murder by a life convict.

Criticism of BNS2

- **Criminal Responsibility Age Discrepancy:** The age of criminal responsibility remains at seven years, with potential extension to 12 years based on the accused's maturity. This may conflict with international convention recommendations.
- **Inconsistencies in Child Offense Definitions:** While the BNS2 defines a child as someone below 18, the age threshold for several offenses against children differs. For instance, the age requirement for offenses like rape and gangrape varies, creating inconsistency.
- **Sedition Provisions and Sovereignty Concerns:** While the BNS2 eliminates sedition as an offense, elements related to endangering India's sovereignty, unity, and integrity might retain aspects of sedition.
- **Retention of IPC Provisions on Rape and Sexual Harassment:** The BNS2 retains the provisions of the IPC on rape and sexual harassment. It does not consider recommendations of the **Justice Verma Committee (2013)** such as making the offence of rape gender neutral and including **marital rape as an offence**.

What are the Major Provisions of Bharatiya Nagarik Suraksha (Second) Sanhita, 2023?

The **Bharatiya Nagarik Suraksha (Second) Sanhita, 2023 (BNSS2)** replaces the **Criminal Procedure Code, 1973 (CrPC)** and introduces significant alterations including:

- **Detention Conditions:** The BNSS2 alters rules for undertrials, **restricting release on personal bond for those accused in severe offenses**, including life imprisonment cases and individuals facing multiple charges.
- **Medical Examination:** It **broadens the scope of medical examinations**, allowing any police officer (not just a sub-inspector) to request one, making the process more accessible.
- **Forensic Investigation:** Mandates **forensic investigation for crimes punishable by at least seven years' imprisonment**.
 - It requires forensic experts to collect evidence at crime scenes, recording the process **electronically**. States lacking forensic facilities should utilize those in other states.
- **Sample Collection:** Extends the **power to collect finger impressions and voice samples**, even from individuals not under arrest, expanding beyond the CrPC's specimen signatures or handwriting orders.
- **Timelines:** The BNSS2 introduces strict timelines: **medical reports for rape victims within 7 days, judgments within 30 days (extendable to 45)**, victim progress updates within 90 days, and charge framing within 60 days from the first hearing.

- **Court Hierarchy:** The CrPC organizes India's criminal courts hierarchically, from Magistrate's Courts to the Supreme Court. It previously allowed cities with over a million people to have Metropolitan Magistrates, but the **BNSS2 eliminates this distinction and the role of Metropolitan Magistrates.**

Criticism of BNSS2

- **Property Attachment from Crime Proceeds and Lack of Safeguards:** The power to seize property from crime proceeds lacks the **safeguards provided in the Prevention of Money Laundering Act**, raising concerns about potential misuse or lack of oversight.
- **Restrictions on Bail for Multiple Charges:** While the CrPC allows bail for an accused detained for **half the maximum imprisonment for an offense**, the BNSS2 denies this facility for individuals facing multiple charges.
 - This restriction, prevalent in cases involving multiple sections, may limit bail opportunities.
- **Handcuff Use and Contradictory Supreme Court Directives:** The BNSS2 permits the use of handcuffs in various cases, including organized crime, which contradicts directives laid down by the Supreme Court.
- **Integration of Trial Procedure and Public Order Maintenance:** The BNSS2 retains CrPC provisions related to the maintenance of public order. This raises questions about whether **trial procedures and the maintenance of public order should be regulated under the same law or addressed separately.**

What are the Major Provisions of Bharatiya Sakshya (Second) Bill, 2023?

The Bharatiya Sakshya (Second) Bill, 2023 (BSB2) replaces the **Indian Evidence Act, 1872 (IEA)**. It retains most provisions of the IEA including those on **confessions, relevancy of facts, and burden of proof**. However, it introduces significant alterations including:

- **Documentary Evidence:**
 - **Definition Expansion:** The BSB2 **broadens the definition of documents to include electronic records** alongside traditional writings, maps, and caricatures.
 - **Primary and Secondary Evidence:** Primary evidence retains its status, encompassing original documents, electronic records, and video recordings.
 - **Oral and written admissions**, along with testimony from a qualified individual examining the documents, are now **considered secondary evidence.**
- **Oral Evidence:** The BSB2 **permits electronic provision of oral evidence**, enabling witnesses, accused individuals, and victims to testify through electronic means.
- **Admissibility of Electronic Records:** Electronic or digital records are granted **equivalent legal status as paper records.**
 - This includes information stored in **semiconductor memory, smartphones, laptops, emails, server logs, locational evidence**, and voicemails.
- **Amended Explanation to Joint Trials:** Joint trials encompass **cases where one accused is absent or has not responded to an arrest warrant**, now categorized as joint trials.

Criticism of BSB2

- **Admissibility of Information from Accused in Custody:** The **BSB2** allows such information to be admissible if it was obtained when the **accused was in police custody**, but not if he was outside. The **Law Commission recommended** removing this distinction.
- **Unincorporated Law Commission Recommendations:** Several recommendations by the Law Commission, such as **presuming police responsibility for injuries sustained by an accused in police custody**, have not been included in the BSB2, despite their significance.
- **Tampering of Electronic Records:** The Supreme Court has recognised that electronic records may be tampered with.
 - While the BSB2 provides for the admissibility of such records, there are **no safeguards to prevent the tampering and contamination of such records** during the investigation process.

14. Decoding Good Governance

Why in News?

On **25th December**, India commemorated **Good Governance Day**, coinciding with the birth anniversary of **former Prime Minister Atal Bihari Vajpayee**.

- This yearly event strives to enhance citizen awareness concerning **accountability in governance and governmental procedures**.
- Three new features on the **iGOT (integrated government online training) Karmayogi** platform: **My iGOT, blended programmes, and curated programmes**, were launched on this occasion.

What is Good Governance?

- **About:**
 - **Governance** refers to the **processes, systems, and structures** through which organizations, societies, or groups are **directed, controlled, and managed**.
 - **Good governance** is defined as a set of values through which **a public institution conduct public affairs and manages public resources** in a way that respects human rights, the rule of law, and the needs of society.
 - The **World Bank** defines good governance in terms of the **traditions and institutions by which authority in a country is exercised**. This includes:
 - the process by which governments are selected, monitored and replaced
 - the capacity of the government to effectively formulate and implement sound policies
 - the respect of citizens and the state for the institutions that govern economic and social interactions among them.
- **Basic Principles of Good Governance:**



What is Worldwide Governance Indicators?

- The **World Bank's Worldwide Governance Indicators** project evaluates over 200 countries based on six fundamental measures of governance.
- The six indicators are:
 - **Voice and Accountability**
 - **Political Stability and Absence of Violence**
 - **Government Effectiveness**
 - **Regulatory Quality**
 - **Rule of Law**
 - **Control of Corruption**

What are the Major Issues Related to Governance in India?

- **Corruption and Bureaucratic Inefficiency:** In **Corruption Perception Index 2022**, India was ranked **85th out of 180 countries**, highlighting concerns about bribery and misuse of public funds.
- **Inequality and Social Exclusion:** Despite economic growth, the gap between rich and poor persists. A 2022 Oxfam report revealed that the **richest 1% in India held more than 40% of the country's wealth**, while the bottom 50% had just 3%. This widens disparities in access to healthcare, education, and opportunities.
- **Ineffective Implementation of Policies and Schemes:** Many well-intentioned government programs suffer from poor execution, leading to limited impact.
 - In 2023, the **CAG found irregularities in the Ayushman Bharat Scheme**. Also another CAG report highlights transfer of **widow pensions to males in Jharkhand**.

- **Inadequate Judicial Infrastructure:** India's courts are overburdened with a massive backlog of cases, leading to delays in dispute resolution and access to justice, particularly for the marginalized.
 - In 2023, the **Supreme Court had a pending docket of over 80,000 cases**, raising concerns about timely access to legal recourse.
- **Environmental Degradation and Climate Change:** India faces major challenges like air pollution, water scarcity, and deforestation. The **2023 World Air Quality Report ranked several Indian cities among the most polluted globally**, highlighting the weak enforcement of environmental regulations.
- **Political Polarization and Weakening Accountability:** Increasing partisanship and a focus on electoral gains sometimes overshadow long-term policy planning and public welfare in India.

What are the Major Initiatives Related to Good Governance in India?

- **Transparency and Accountability:**
 - **Right to Information Act (2005):** Empowers citizens to access government information, promoting transparency and reducing corruption.
 - **Central Public Grievance Redress and Monitoring System (CPGRAMS):** Online platform for registering and tracking grievances against government departments.
 - **E-Governance Initiatives:** Digitization of government services (e.g., **online tax filing, property registration**) for increased efficiency and reduced human interaction.
 - **Citizen Charters:** Commitment to service standards and timelines by government agencies, enhancing accountability.
- **Citizen Participation and Empowerment:**
 - **MyGov platform:** Enables citizens to participate in policy discussions, submit ideas, and provide feedback to the government.
 - **Gram Sabhas:** Village-level meetings for participatory decision-making in rural areas.
 - **Right to Education Act (2009):** Ensures free and compulsory education for children aged 6-14, empowering communities.
- **Decentralization and Local Governance:**
 - **73rd and 74th Constitutional Amendments:** Empower Panchayats (village councils) and Municipalities with financial and administrative powers, promoting local democracy.
 - **Aspirational Districts Program:** Focuses on improving socio-economic indicators in **112 geographically disadvantaged districts**.
 - **Smart Cities Mission:** Development of 100 cities with infrastructure and technology solutions for better living.
- **Other Initiatives:**
 - **Digital India Programme:** Aims to transform India into a digitally empowered society with widespread access to technology.
 - **Direct Benefit Transfers:** Transfer of subsidies and benefits directly to beneficiaries through bank accounts, reducing leakages and corruption.
 - **Aadhaar card:** Unique identification system for citizens, promoting financial inclusion and service delivery.
 - **Insolvency and Bankruptcy Code (2016):** Streamlines the process of resolving bad debt and facilitating business revival.
 - **Unified Payments Interface (UPI):** Instant real-time mobile payment system developed by the **National Payments Corporation of India (NPCI)**.
 - Enables seamless inter-bank transactions using a single mobile app.

Way Forward

- **JanData Platform:** Create a **secure data platform backed by blockchain technology** for personalized services and direct participation of citizens in policy decisions.
 - It should include **Smart Governance Dashboards**, displaying key performance initiatives for various government departments, promoting transparency and accessibility.
- **Reforming Bureaucracy:** Streamlining **administrative processes, reducing red tape, and enhancing professionalism** and accountability within the public service is also crucial. **VIKAS (Variable and Immersive Karmayogi Advanced Support)** will be a crucial step in this direction.
- **Fast-track Judicial Reforms:** Address the **backlog of cases, improve infrastructure and efficiency within the court system**, and ensure speedy access to justice for all. **E-courts and live streaming of court proceedings** is a significant step in this direction.
- **AI-powered Grievance Redressal:** Developing an AI-driven system that analyzes **public complaints, identifies patterns, and automatically directs them to the relevant authorities** for swift resolution.

- **Reimagining Citizen Engagement:** Establish **community-based innovation labs** across rural and urban areas in supervision of **Urban Local Bodies and Panchayats**, empowering citizens to create local solutions to local problems in collaboration with government agencies.
- **Futuristic Education Curriculum:** Integrate skills like **critical thinking, digital literacy, and data analysis into the education system**, preparing future generations for active participation in a technology-driven governance landscape.

Therefore, India must follow the principle of "**Minimum Government, Maximum Governance**" aligning with **Sustainable Development Goal (SDG) 16: Peace, Justice, and Strong Institutions**.

Atal Bihari Vajpayee

- Born on **25th December, 1924, in Gwalior, now part of Madhya Pradesh**, Atal Bihari Vajpayee entered politics during the **Quit India Movement of 1942**.
- Served as **Prime Minister in 1996 and 1999**, becoming the first since Jawaharlal Nehru to achieve successive mandates.
 - Won **9 Lok Sabha and 2 Rajya Sabha elections**, earning the title of **India's 'Best Parliamentarian' in 1994**.
- Received **Padma Vibhushan in 1994** and awarded the **Bharat Ratna, India's highest civilian honor, in 2015**.



15. MGNREGS Scheme

Why in News?

The **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)** has witnessed a **significant surge in women's participation**, marking a historic high in the **current financial year of 2023-24**.

What are the Women Participation Trends in MGNREGA?

- **Women Participation Trends:**
 - There has been a **gradual increase in women's participation over the last decade**, with percentages rising from 53.19% during the **Covid-19** outbreak in 2020-21 to the current 59.25%.
 - Southern states like Kerala, Tamil Nadu, Puducherry, and Goa showcase **notably high rates of women's involvement**, surpassing 70%, while northern states like Uttar Pradesh and Madhya Pradesh lag **behind at around 40% or below**.
 - Despite historical disparities, some states like Uttar Pradesh, Madhya Pradesh, and Lakshadweep show **recent improvements in women's participation rates** in the ongoing financial year, attributed to incremental percentages.
- **Rural Labor Force Trends:**
 - Beyond MGNREGS, the **Periodic Labour Force Survey (PLFS)** by the Ministry of Statistics and Programme Implementation demonstrates a **substantial surge in female Labour Force Participation Rate (LFPR) in rural areas**.
 - Notable figures show an **increase from 18.2% in 2017-18 to 30.5% in 2022-23 in rural female LFPR**, along with a decline in female unemployment rates from 3.8% to 1.8% during the same period.

What is MGNREGA Scheme?

- **About:**
 - MGNREGA is one of the largest work guarantee programmes in the world launched in 2005 by the **Ministry of Rural development**.
 - It provides a legal guarantee for one hundred days of employment in every financial year to adult members of any rural household willing to do public work-related unskilled manual work at the statutory minimum wage.
 - Active workers: 14.32 Crore (2023-24)
- **Major Features:**
 - The cornerstone of **MGNREGA's design is its legal guarantee**, ensuring that any rural adult can request work and must receive it within 15 days.

- If this commitment is not met, an "unemployment allowance" must be provided.
- It requires that priority shall be given to women in such a way that at least one-third of the beneficiaries shall be women who have registered and requested for work.
- Section 17 of the MGNREGA has mandated Social audit of all Works executed under the MGNREGA.
- **Implementation Agency:**
 - The Ministry of Rural Development (MRD), Govt of India is monitoring the entire implementation of this scheme in association with state governments.
- **Objective:**
 - This act was introduced with an aim of improving the **Purchasing Power** of the rural people, primarily semi or unskilled work to people living below poverty line in rural India.
 - It attempts to bridge the gap between the rich and poor in the country.
- **Achievements of 2022-23:**
 - 11.37 crore households availed employment.
 - 289.24 crore person-days employment has been generated out of which:
 - 56.19% were for women
 - 19.75% were for **Scheduled Castes (SCs)**
 - **17.47% were for Scheduled Tribes (STs).**

What are the Challenges with the Implementation of the Scheme?

- **Delay and Insufficiency in Funds Dispersal:**
 - Most states have failed to disburse wages within 15 days as mandated by MGNREGA. In addition, workers are not compensated for a delay in payment of wages.
 - This has turned the scheme into a supply-based programme and subsequently, workers had begun to lose interest in working under it.
 - There is ample evidence by now, including an admission by the Ministry of Finance, that delays in wage payments are a consequence of insufficient funds.
- **Caste Based Segregation:**
 - There were significant variations in delays by caste. While 46% of payments to **SC (Scheduled Caste) workers and 37% for ST (Scheduled Tribes) workers** were completed in the mandated seven-day period, it was a dismal 26% for non-SC/ST workers.
 - The negative impact of caste-based segregation was felt acutely in poorer States such as Madhya Pradesh, Jharkhand, Odisha and West Bengal.
- **Ineffective Role of PRI:**
 - With very little autonomy, **Panchayati Raj Institution (PRI)** are not able to implement this act in an effective and efficient manner.
- **Large Number of Incomplete works:**
 - There has been a delay in the completion of works under MGNREGA and inspection of projects has been irregular. Also, there is an issue of quality of work and asset creation under MGNREGA.
- **Fabrication of Job cards:**
 - There are several issues related to the existence of fake job cards, the inclusion of fictitious names, missing entries and delays in making entries in job cards.

What are the Initiatives under MGNREGS?

- **Amrit Sarovar:** Construction/renovation of at least 75 Amrit Sarovars (ponds) in each district of the country; they will help in increasing the availability of water, both on surface and under-ground.
- **Jaldoot App:** It was launched in Sept 2022 for measuring the water level in a Gram Panchayat through 2-3 selected open wells twice a year.
- **Ombudsperson for MGNREGS:** Ombudsperson App was launched in Feb 2022 for smooth reporting and categorization of grievances received from various sources related to the implementation of the MGNREGS.

Way Forward

- There is a need to ensure **consistent fund flow to states and implementing agencies** while leveraging digital tools for transparent, timely wage payments.
- **Focus on exclusion errors**, identifying pockets where marginalized SC and ST families are missing out on MGNREGA benefits.
- **Empower State and Central Employment Guarantee Councils** for informed decisions, incorporating public participation via assemblies, civil society, and worker unions.

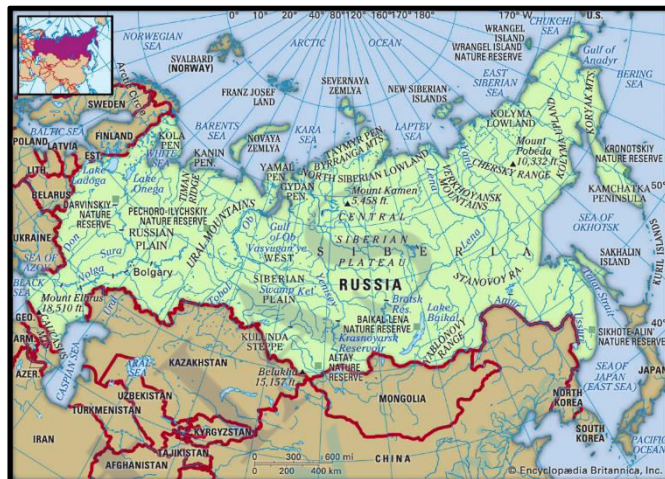
16. India-Russia Bilateral Meeting

Why in News?

Recently, the External Affairs minister of India has visited Russia for a Bilateral Meeting where both the countries signed agreements on **Nuclear Power** and in areas of medicines, pharmaceutical substances and medical devices.

What are the Key Highlights of the India-Russia Bilateral Meeting?

- **Economic Collaboration:**
 - Emphasis on strategic collaboration in **defense, space exploration, nuclear energy**, and technology sharing, reflecting the robustness of the longstanding partnership and **exploring avenues for deeper cooperation.**
 - Both Countries agreed on the **expansion of the exports of Russian hydrocarbons** to the Indian market as well as the cooperation in the peaceful use of nuclear energy.
 - The two sides **finalised the programme of cooperation in the Far East** and it was decided to hold an early meeting of EaEU-India FTA negotiations.
- **Agreement on Nuclear Power Plants:**
 - India and Russia signed **agreements to move forward with future units of the Kudankulam nuclear power project** in Tamil Nadu.
 - India is already operating two Russian-built nuclear plants while another four are under **construction in Kudankulam, Tamil Nadu.**
 - The Kudankulam nuclear power plant, **India's largest, is being built in Tamil Nadu** with the technical assistance of Russia. The construction began in March 2002. Since February 2016, the first power unit of the Kudankulam NPP has been steadily operating at its design capacity of 1,000 MW.
 - The plant is expected to start operating at full capacity in 2027, according to Russian state media.
- **Diplomatic Initiatives:**
 - Discussion on multilateral forums and international organizations where India and Russia collaborate or hold common interests, including forums like **BRICS, SCO (Shanghai Cooperation Organization), and UN affairs.**



How has Been the Indo-Russia Relations?

- **Historical Background:**
 - During the **Cold War**, India and the Soviet Union had a strong strategic, military, economic and diplomatic relationship. After the Dissolution of the Soviet Union, **Russia inherited its close relationship with India** which resulted in both nations sharing a Special Strategic Relation.
 - However, the **relations have taken a steep downfall over the past few years**, especially in the post-Covid scenario. One of the biggest causes for this is **Russia's close relations with China and Pakistan**, which have caused many geopolitical issues in the past few years for India.
- **Political Relations:**
 - Two Inter-Governmental Commissions – **one on Trade, Economic, Scientific, Technological and Cultural Cooperation (IRIGC-TEC)**, and another on Military-Technical Cooperation (IRIGC- MTC), meet annually.
- **Bilateral Trade:**
 - India's total **bilateral trade with Russia stood at ~USD 13 Billion in 2021-22** and USD 8.14 Billion in 2020-21.
 - Russia is India's seventh biggest trading partner, up from 25th position in 2021.
 - The US, China, UAE, Saudi Arabia, Iraq, and Indonesia were the six countries that recorded higher volumes of trade with India during the first five months of 2022-23.
- **Defence and Security Relations:**
 - Both countries regularly conduct the Tri-Services exercise '**INDRA**'.
 - The joint military programmes between India and Russia include:
 - **BrahMos cruise missile programme**
 - **5th generation fighter jet programme**
 - **Sukhoi Su-30MKI programme**

- The military hardware purchased/leased by India from Russia includes:
 - **S-400 Triumph**
 - **Kamov Ka-226** 200 to be made in India under the **Make in India** initiative
 - **T-90S Bhisma**
 - **INS Vikramaditya aircraft carrier programme.**
- **Science and Technology:**
 - Science & Technology has played a **key role in the bilateral India-Russia (and India-Soviet) partnership**, especially in the early days after India's independence where the erstwhile Soviet Union's assistance was crucial to the establishment of Bhilai Steel Plant, Indian Institute of Technology, Bombay and India's space program.
 - During the early stages of the Indian space program, the Soviet Union's assistance played a key role in the launch of the first **Indian satellites-Aryabhata and Bhaskara** in 1984.
 - Today, India & Russia work together on basic sciences, materials science, mathematics and cutting-edge areas like **India's manned spaceflight program** (Gaganyaan), nanotechnologies and quantum computing.

What is the Significance of Russia for India?

- **Balancing China:**
 - The Chinese aggression in the border areas of eastern Ladakh, brought India-China relations to an inflection point, but also demonstrated that Russia can contribute to defusing tensions with China.
 - Russia organized a trilateral meeting among the foreign ministers of Russia, India, and **China following deadly clashes in the Galwan Valley** in the disputed territory of Ladakh.
- **Emerging New Sectors of Economic Engagement:**
 - Apart from traditional areas of cooperation such as weapons, hydrocarbons, nuclear energy, and diamonds, new sectors of economic engagement are likely to emerge — **mining, agro-industrial, and high technology, including robotics, nanotech, and biotech.**
 - India's footprint in the Russian Far East and in the Arctic is set to expand. Connectivity projects may get a boost too.
- **Combating Terrorism:**
 - India and Russia are working to close the gap on Afghanistan and are calling for early finalization of the **Comprehensive Convention on International Terrorism.**
- **Support At Multilateral Forums:**
 - Additionally, Russia supports India's candidacy for permanent membership of a reformed **United Nations Security Council** and of the Nuclear Suppliers Group.
- **Russia's Military Exports:**
 - Russia was **India's largest arms supplier in the periods between 2013-17 and 2018-22**, but its share of arms imports to India fell from 64% to 45%, according to **Stockholm International Peace Research Institute's (SIPRI) Trends in International Arms Transfers 2022** report.

Way Forward

- Russia will remain a key defense partner for India for decades to come.
- The two countries have been discussing how they can cooperate in using India as a production base for exporting to third countries Russian-origin equipment and services.
 - To address this, Russia has made legislative changes allowing its companies to set up joint ventures in India to address it following an Inter-Governmental Agreement signed in 2019.
 - This agreement needs to be implemented in a time bound manner.

17. ECI Promotes Respectful Dialogue on Disabilities in Politics

Why in News?

The **Election Commission (EC)** has issued guidelines to **political parties** to use disability and gender sensitive language, and refrain from using derogatory references to **persons with disabilities (PwD)** in public speeches, campaigns and writings.

What are the Key Guidelines of the EC?

- **Prohibition of Derogatory Language:** Political parties and their representatives are urged to refrain from using **derogatory, insulting, or offensive references** related to disability or PwDs in any **public statements, speeches, writings, articles, or campaigns**. And make sure that all campaigns remain accessible to all citizens.
- **Avoidance of Ableist Language:** Specific terms considered ableist or offensive towards PwDs such as "dumb," "retarded," "blind," "deaf," "lame," etc., are highlighted as language to be avoided.
- **Internal Review and Rectification:** All campaign materials, including speeches, social media posts, advertisements, and press releases, should **undergo internal review within the political party** to identify and rectify instances of offensive language.
- **Declaration of Use of Sensitive Language:** Political parties should **declare on their websites their commitment to using disability and gender-sensitive language**, respecting human equality, equity, dignity, and autonomy.
- **Adoption of Rights-Based Terminology:** Parties are encouraged to use rights-based terminologies as outlined in the **Convention on Rights of Persons with Disabilities (CRPD)**.
- **Legal Consequences:** Any violation of the guidelines may fall under the provisions of **Section 92 of the Rights of Persons with Disabilities Act 2016**.

What is the Status of Persons with Disabilities in India?

- **Status:** As per the 76th round of **National Sample Survey (NSS)**, **2.21%** of the Indian population identifies as having a disability.
 - The incidence of disability is **highest in the age group 10-19 years**, highlighting the need for early intervention and support.
- **Constitutional and Legislative Framework for PwD in India:**
 - **Constitution:**
 - The Constitution of India ensures **equality, freedom, justice and dignity of all individuals** through **Fundamental Rights** and implicitly mandates an inclusive society for all including the persons with disabilities.
 - **Article 41 of the Constitution (Directive Principles of State Policy)** states that the State shall make effective provision for securing the right to work, to education and to **public assistance in cases of unemployment, old age, sickness and disablement**, within the limits of its economic capacity and development.
 - **Legislation:**
 - The **Rights of Persons with Disabilities Act, 2016 (RPwD Act)** which replaced the **Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995**, is the most comprehensive legislation for PwDs in India.
 - Government job reservation for PwD is **4%**, while in government or aided higher educational institutions, seats reserved for students with disabilities is **5%**.
 - **Other Related Initiatives:**
 - **Accessible India Campaign**
 - **DeenDayal Disabled Rehabilitation Scheme**
 - **National Fellowship for Students with Disabilities**
- **Major Challenges:**
 - **Accessibility:** Many **public spaces, transportation systems, and buildings lack proper accessibility features** like ramps, elevators, and designated spaces for PwDs, making it challenging for them to move around independently.
 - Only **around 3%** of public buildings in India are accessible to PwDs (Census of India, 2011).
 - **Inadequate Healthcare:** Only **37% of PwDs in rural India** have access to healthcare facilities, according to the Census of India, 2011.
 - A **recent report by the World Health Organization** identified a shortage of healthcare professionals trained in disability management across India, limiting access to specialised care.
 - **Limited Educational Opportunities:** Access to quality education for PwDs remains a challenge. Schools often lack adequate facilities and trained teachers to cater to diverse learning needs, resulting in exclusion from mainstream education.
 - **Employment Barriers:** PwDs encounter significant hurdles in finding suitable employment. **Discrimination, lack of accessible workplaces**, and a dearth of accommodations to meet their needs often lead to high unemployment rates among PwDs.
 - **Stigma and Discrimination:** There is **still a prevailing stigma surrounding disabilities in India**, and PwDs often face prejudices that limit their opportunities and acceptance in society.

- **Legal and Policy Gaps:** While there are laws and policies in place to protect the rights of PWDs in India, **implementation and enforcement remain inconsistent.** This gap affects the actual realization of their rights and access to resources.

Way Forward

- **Reimagining Assistive Technology:** Government can partner with tech giants and design institutes to create a robust ecosystem of accessible and affordable assistive technology using **Artificial Intelligence and the Internet of Things**, catering to diverse disabilities.
 - It can include **self-navigating public spaces**, adaptive traffic signals, and voice-controlled interfaces for effortless access.
 - Also, promote open-source hardware and software development for PwDs to **customize and repair devices.**
- **Revolutionising Education and Skill Development:** Implement mandatory disability sensitivity training for educators and integrate it into teacher training programs.
 - Deploy AI-powered learning assistants, interactive tools, and accessible e-learning platforms to cater to diverse learning needs.
- **Employment Landscape Shift:** Mandatory PwD friendly infrastructure in corporations and facilitate PwDs' participation in flexible **online gig work** suited to their skills and abilities, empowering them with remote work options.
 - Incubating **PwD-led startups offering accessible products and services**, fostering self-reliance and creating employment opportunities.
- **Towards Inclusive India:** Organizing community-based workshops and sensitization programs to promote **understanding and inclusivity of PwDs.**



GS Paper – 3

1. Sugar's Pressmud for Green Energy Production

Why in News?

India is viewing **Pressmud**, a residual byproduct of **Sugar**, as a valuable resource for green energy production by creating **Compressed Biogas (CBG)**.

- India holds a key position in the worldwide sugar economy, emerging as the **foremost sugar producer** since 2021-22, surpassing Brazil. Additionally, it stands as the **second-largest sugar exporter** globally.

What is Compressed Bio-Gas (CBG)?

- CBG is a **Renewable, environmentally friendly gaseous fuel** derived from the anaerobic decomposition of organic materials. It is produced through a process called **Biomethanation or anaerobic digestion**, where various organic sources such as agricultural waste, animal manure, food waste, sewage sludge, and other biomass materials are **broken down by bacteria in the absence of oxygen**.
- The resulting biogas primarily consists of **methane (usually over 90%)**, carbon dioxide, traces of hydrogen sulfide, and moisture.
- To convert biogas into CBG, purification steps are employed to remove **impurities such as carbon dioxide, hydrogen sulfide, and moisture**.
- The purified methane gas is then compressed to a high pressure, typically around 250 bar or higher, hence the term "Compressed Biogas."

What is Pressmud?

- About:**
 - Pressmud, also known as filter cake or press cake, is a **residual byproduct in the sugar industry** that has gained recognition as a valuable resource for green energy production.
 - This byproduct offers Indian sugar mills an **opportunity to generate additional revenue by utilizing it as a feedstock for biogas production through anaerobic digestion**, leading to the creation of Compressed Biogas (CBG).
 - Anaerobic digestion is a process through which bacteria break down organic matter—**such as animal manure, wastewater biosolids, and food wastes**—in the absence of oxygen.
 - Typically, the yield of pressmud ranges from 3-4 % by weight with the **input sugarcane processed in a unit**.

Note

Pressmud has the potential to yield approximately 460,000 tonnes of CBG, valued at Rs 2,484 crore, considering the minimum guaranteed price set by the central government's **Sustainable Alternative Towards Affordable Transportation scheme (SATA)**

Advantages of Pressmud Utilization for CBG Production:

- Fewer Complexities:** Its advantageous qualities include consistent quality, simplicity in sourcing, and **fewer complexities compared to other feedstocks**.
- Simplified Supply Chain:** It eliminates the **complexities associated with the feedstock supply chain**, as found in the case of agricultural residue, where biomass harvesting machinery is required for harvesting and aggregation.
- Single Sourcing:** The **feedstock is sourced from one or two producers or sugar mills**, as opposed to agricultural residue, which involves **multiple producers / farmers** within a narrow window of 45 days per year.

- **Quality and Efficiency:** Quality consistency and higher conversion efficiency, requiring **less feedstock quantity compared to alternatives** like cattle dung.
 - Approximately 25 tonnes of pressmud are needed to produce a tonne of CBG. In comparison, cattle dung requires 50 tonnes for the same gas output.
- **Cost-effectiveness:** Lower cost (Rs 0.4-0.6 per kilogramme) compared to other feedstocks like agricultural residue and cattle dung. It eliminates **pretreatment costs as it lacks the organic polymer lignin**, unlike agriresidue.
- **Challenges Faced by Pressmud Utilization:**
 - Pressmud faces challenges such as **escalating prices**, competition for usage in other industries, and **storage complexities** due to gradual decomposition, necessitating innovative storage solutions.
 - As an organic residue, **it is sought after in sectors like animal feed, bioenergy production** (for biogas or biofuels), and agricultural soil amendments. This competition can sometimes **limit its availability or increase its cost for specific applications**.

What is India's Pressmud Production landscape?

- **Production Statistics:**
 - In the fiscal year 2022-23, India's sugar **production reached 32.74 million tonnes, generating about 11.4 million tonnes of pressmud**.
- **Sugarcane Growing States:**
 - The primary sugarcane-growing states, notably Uttar Pradesh and Maharashtra, contribute **significantly, covering approximately 65% of India's total sugarcane cultivation area**.
 - Key sugarcane-producing states include Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, and Bihar, accounting for a substantial portion of India's overall sugarcane production.

Way Forward

- To harness the full potential of pressmud for CBG production, various interventions are crucial:
 - **State-level Policies:** Implementation of supportive bioenergy policies by states, streamlining approval processes and offering incentives.
 - **Price Control Mechanisms:** Establishing mechanisms to control pressmud prices and encouraging long-term agreements between sugar mills and CBG plants.
 - **Technological Advancements:** Research and development for efficient pressmud storage technologies to prevent methane emissions and minimize gas loss.
 - **Training Initiatives:** Conducting training sessions for CBG plant operators on plant operations, scientific equipment handling, and feedstock characterization.

2. Unemployment Rate in Urban Areas

Why in News?

The **Periodic Labour Force Survey (PLFS)**, conducted by the **National Sample Survey Office (NSSO)**, recently released data for **July-September 2023**, shedding light on India's **unemployment** rate in urban areas.

What are the Major Highlights of the Recent PLFS?

- **Urban Unemployment Rate:** The unemployment rate in urban areas showcased a decline from **7.2% (July-September 2022) to 6.6% (July-September 2023)**.
 - **Male:** Decreased from 6.6% to 6% in the given time period.
 - **Female:** Witnessed a more positive trend, marking a decrease from **9.4% to 8.6%** in the given time period.
- **Worker-Population Ratio:** The **worker population ratio**, percentage of employed persons in the population, in urban areas increased from **44.5% in July-September, 2022 to 46% in July-September, 2023** for persons of age 15 years and above.
 - **Male:** Increased from 68.6% to 69.4% during the given time period.
 - **Female:** Increased from 19.7% to 21.9% during the given time period.
- **Labour Force Participation Rate:** The LFPR in urban areas increased from **47.9% in July-September, 2022 to 49.3% in July-September, 2023**
 - **Male:** Saw a marginal uptick from **73.4% to 73.8% during this period**.
 - **Female:** Exhibited a more **substantial increase from 21.7% to 24.0%**.

What is the Periodic Labour Force Survey?

- **About:**
 - Considering the importance of availability of labour force data at more frequent time intervals, **NSSO** launched **Periodic Labour Force Survey** in April 2017.
 - PLFS defines unemployment rate as the percentage of persons unemployed among the persons in the **labour force**.
- **Objective of PLFS:**
 - To estimate the key employment and unemployment indicators (viz. **Worker Population Ratio, Labour Force Participation Rate, Unemployment Rate**) in the short time interval of three months for the urban areas only in the '**Current Weekly Status**' (**CWS**).
 - To estimate employment and unemployment indicators in both '**Usual Status**' and **CWS in both rural and urban areas annually**.

What are the Related Key Terms?

- **Labour Force Participation Rate (LFPR):** It represents the **percentage of people aged 15 and above** who are either employed or unemployed but actively seeking work.
- **Worker Population Ratio (WPR):** This measures the percentage of employed individuals within the total population.
- **Unemployment Rate (UR):** It indicates the percentage of unemployed persons among those in the labour force.
- **Regarding Activity Status:**
 - **Principal Activity Status (PS):** The primary activity a person engaged in for a substantial period (during 365 days preceding the survey).
 - **Subsidiary Economic Activity Status (SS):** Additional economic activities performed, apart from the usual primary activity, for at least 30 days in the 365-day period before the survey.
 - **Current Weekly Status (CWS):** This status reflects a person's activities during the immediate past 7 days before the survey date.

What are the Major Issues Related to Unemployment in Urban Areas?

- **Structural Unemployment:** Urban areas often face a **disparity between the skills possessed by the workforce and the skills demanded by industries**.
 - The education system does not **align with the needs of the job market**, leading to a surplus of unskilled or under-skilled workers.
 - **Rapid technological advancements and changes in the economy** have led to the decline of traditional industries, resulting in job losses for many urban workers who lack the necessary skills for emerging sectors.
- **Informal Sector Dominance:** A significant portion of the **urban population is employed in the informal sector**, characterized by **low pay, job insecurity, and lack of social security benefits**.
 - This sector often experiences seasonal fluctuations, leading to inconsistent employment opportunities.
 - Many workers are **forced to accept jobs that are below their skill levels due to the scarcity of formal employment opportunities, leading to underutilization of human resources**.
 - According to IMF, In India in terms of employment share the unorganized sector employs 83% of the workforce.
 - Also, there are **92.4% informal workers (with no written contract, paid leave and other benefits)** in the economy.
- **Demographic Challenges:** Rapid urbanization and population influx into cities have **outpaced job creation**, causing a strain on the job market and resulting in higher unemployment rates.
 - **Rural-to-urban migration** often leads to an oversupply of labour in cities, contributing to higher unemployment rates among migrant populations, further exacerbating urban poverty.
- **Credential Inflation:** Overemphasis on educational qualifications can lead to **situations where individuals are overqualified for available jobs**, leading to underemployment or unemployment.

What are the Government's Initiatives Related to Employment?

- Support for Marginalized Individuals for Livelihood and Enterprise (SMILE)
- PM-DAKSH (Pradhan Mantri Dakshta Aur Kushalta Sampann Hitgrahi)
- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
- Start Up India Scheme

- Rozgar Mela
- Indira Gandhi Urban Employment Guarantee Scheme- Rajasthan.

Way Forward

- **Reformative Education:** Aligning education with the **current market demands by updating curricula to impart relevant skills, emphasizing vocational training, and promoting lifelong learning** to enhance employability.
- **Startup Ecosystem Support:** Fostering a conducive environment for startups by **providing financial incentives, reducing bureaucratic hurdles, and offering mentorship programs** to encourage entrepreneurship.
- **Pro-Employment Policies:** Formulating and implementing policies that promote job creation, including investment in infrastructure, industry-friendly regulations, and fiscal incentives for businesses generating employment.
- **Promoting Creative Economy:** Investing in cultural industries, arts, and creative sectors, supporting artisans, performers, and craftsmen to generate employment through cultural entrepreneurship.
- **Green Spaces and Urban Agriculture:** Promoting **urban agriculture and green spaces within cities**, creating employment in farming, gardening, and related eco-friendly activities.
- Offering training in sustainable practices, landscaping, and urban forestry to create employment in the green sector.

3. Global Positioning System

Why in News?

Global Positioning System (GPS) is one of few everyday technologies that have had the kind of revolutionary impact on civilian, military, scientific, and urban realms, redefining our sense of location and impacting diverse sectors globally.

What is the Global Positioning System?

- **About:**
 - The GPS, initiated by the U.S. Department of Defense in 1973, comprises three main segments,
 - **Space:** Detailing the space segment, the **24 satellites in six orbits** ensure global coverage, allowing receivers to access signals from at least four satellites simultaneously—a fundamental necessity for accurate positioning.
 - All six orbits are positioned at **an altitude of 20,200 km** above the Earth, and **each orbit has four satellites at all times**. Each satellite completes two orbits in a single day.
 - **Control:** The control segment, managed by ground-based stations, ensures satellite performance and signal accuracy, adhering to the **Standard Positioning Service (SPS)** standards published in 2020. Key stations across the globe manage and monitor the system's integrity.
 - The **SPS standard** tells application developers and users anywhere in **the world what they can expect from the GPS system**.
 - **User:** User segment encompasses diverse sectors from agriculture to military operations, with an estimated 6.5 billion **GNSS (Global Navigation Satellite System)** devices worldwide in 2021, expected to surge to 10 billion by 2031, underscoring its pervasive influence.
- **Functionality of GPS:**
 - GPS operates through **satellite-transmitted radio signals** at specific frequencies (L1 and the L2 frequencies at 50 bits/second), received and triangulated by GPS receivers, enabling precise location determination in three dimensions of space and one of time.
- **Precision and Adjustments:**
 - Error adjustments, including relativistic effects on satellite clocks and relative velocities, are factored in to enhance accuracy, highlighting the meticulousness of GPS calculations.
 - Satellites maintain precise time for GPS by using atomic clocks. These clocks are critical because even tiny timing differences **could lead to substantial location errors**.

Do Other Countries Have GNSS?

- Several countries operate their own Global Navigation Satellite Systems (GNSS) alongside the GPS. Such systems are currently operated by **Australia, China, the European Union (EU), India, Japan, South Korea, Russia, and the U.K.**
 - Of these, Russia's **GLONASS**, the EU's Galileo, and China's BeiDou systems are global.

- India mooted its own Indian Regional Navigation Satellite System in 2006, later rechristened **Navigation with Indian Constellation (NavIC)**. Its space segment **consists of seven satellites**: three in geostationary orbits and four in geosynchronous orbits.
 - As of May 2023, the minimum number of satellites (four) could facilitate ground-based navigation. The master control facilities are located in Hassan in **Karnataka and Bhopal in Madhya Pradesh**.
 - The NavIC satellites use rubidium atomic clocks and transmit data in the **L5 and the S bands**, with newer satellites also transmitting in the L1 band.
- India also operates the **GPS-Aided Geo Augmented Navigation (GAGAN) system**, which was developed and established by the **Indian Space Research Organisation (ISRO)** and the Airports Authority of India.
 - GAGAN's primary purpose is "safety-of-life civil aviation applications catering to the Indian airspace" and for providing "correction and integrity messages for GPS".

4. UNEP's Action Plan for Cooling Sector

Why in News?

The **United Nations Environment Programme (UNEP)** has proposed an action plan aimed at significantly **reducing emissions from the global cooling sector** in its recent report titled "**Keeping it Chill: How to meet cooling demands while cutting emissions.**"

- This initiative carries the potential to make a substantial impact on the predicted 2050 **greenhouse gas emissions**, reducing them by 60%.
- The report is released in support of the **Global Cooling Pledge**, a joint initiative between the United Arab Emirates as host of the **Conference of Parties(COP28)** and the **Cool Coalition**.

Note

- The Cool Coalition is a global network of partners working to provide efficient, climate-friendly cooling for all.
- The UNEP launched the Cool Coalition at the First Global Conference on Synergies between the **2030 Agenda for Sustainable Development Goals** and the **Paris Agreement**.
 - India is a member of the Cool Coalition.

What is UNEP's Proposed Action Plan for Sustainable Cooling?

- **Nature-Based Solutions:**
 - Recommendations include **passive cooling measures** like shading, ventilation, insulation, green roofs, and reflective surfaces, and reintroducing nature to urban areas.
 - Passive cooling can reduce the need for **mechanical cooling and save energy and emissions**.
- **Efficiency Standards:**
 - Emphasizes the importance of **higher energy efficiency technologies and practices** for cooling equipment, such as air conditioners, refrigerators, and fans.
 - Higher-energy efficiency cooling can **reduce the energy consumption** and emissions of cooling devices and lower the costs for users and utilities.
- **Phasedown of Refrigerants:**
 - This refers to the use of alternative substances to cool devices, such as **hydrocarbons, ammonia, or carbon dioxide**, instead of **hydrofluorocarbons (HFCs)**, which are potent greenhouse gases.
 - HFCs are a group of **synthetic gases** primarily used for cooling and refrigeration. HFCs, classified as "**super-pollutants**," possess potent greenhouse gas properties, **capable of trapping heat hundreds to thousands of times more than carbon dioxide**.
 - Despite their significant impact, they are short-lived climate pollutants, with an average **atmospheric lifespan** of 15 years.
 - Low-global warming potential refrigerants can reduce the direct emissions of cooling devices and contribute to the phase-down of HFCs under the **Kigali Amendment to the Montreal Protocol**.
 - Urges a **faster phasedown of climate-warming refrigerants** and air conditioning.

Why Address the Cooling Sector?

- The cooling sector plays a crucial role in **combating rising temperatures**, ensuring food safety, industrial cooling processes, and driving productive economies.

- However, without intervention, the growing demand for cooling equipment could lead to a substantial increase in electricity consumption and emissions.
 - The cooling sector accounts for a **substantial 20% of global electricity consumption**.
- If current policies continue, the installed capacity of cooling equipment globally will triple, resulting in a **more than doubling of electricity consumption by 2050**.
 - This could lead to **emissions between 4.4 billion and 6.1 billion tonnes of carbon dioxide equivalent (CO₂e) in 2050**, accounting for over **10% of global projected emissions that year**.

What are the Benefits of Sustainable Cooling?

- Passive cooling techniques and efficient cooling equipment can save consumers **USD 17 trillion between 2022 and 2050**.
 - It is projected to reduce peak power requirements by **1.5-2 terawatts (TW)**, **avoiding substantial power generation investments**.
- Increasing the adoption of **low-global warming potential technologies** in new equipment and effectively managing refrigerant life cycles can reduce **HFC emissions by 50% in 2050**.
 - **Decarbonizing** the power grid can further **reduce sectoral emissions by 96%**.

What are the Initiatives Related to Sustainable Cooling?

- **Global:**
 - **National Cooling Action Plans (NCAPs):**
 - Presently, **more than 40 countries, including India, have developed NCAPs**, and 25 others are at various stages of preparing theirs as well.
 - Though India and China have included implementation mechanisms in their NCAPs, the rollout has been slow.
 - **Global Cooling Pledge:**
 - At the the United Nations Framework Convention on Climate Change, the host country United Arab Emirates and the Cool Coalition launched the Global Cooling Pledge.
 - Over 60 countries signed up to the Pledge with commitments to reduce the climate impact of the cooling sector.
 - **Kigali Amendment Acceleration:**
 - The Kigali Amendment is an international agreement to reduce the production and consumption of HFCs.
 - The amendment is part of the Montreal Protocol on Substances that Deplete the **Ozone Layer**.
 - The Kigali Amendment aims to reduce HFC production and consumption by 80–85% by 2047.
 - This is expected to prevent the emissions of up to 105 billion tonnes of CO₂ of greenhouse gases, avoiding up to 0.5 degree Celsius of global temperature rise by 2100.
- **India:**
 - **India Cooling Action Plan (ICAP)**.
 - **Bureau of Energy Efficiency (BEE) Star Rating Programme**.

5. Global Partnership on Artificial Intelligence (GPAI) Summit

Why in News?

The Prime Minister of India inaugurated the **Global Partnership on Artificial Intelligence (GPAI) Summit**.

- **India is the lead chair of GPAI in 2024**. The GPAI is an alliance of 28 countries; the European Union adopted the 'New Delhi Declaration' of the GPAI.

What are the Key Highlights of the GPAI Summit?

- The Prime Minister of India discussed the national AI portal, highlighting the **AIRAWAT** initiative and raising concerns over the potential misuse of **deep fake technology**.
- **YUVAi** was prominently featured at the **GPAI Summit**, and the winners of the **YUVAi** initiative and start-ups showcased their **AI models and solutions**.
- The Prime Minister suggested using AI to make digital services available in **local languages** to increase **digital inclusion**.
- **Responsible AI, data governance, future of work, and innovation and commercialization** are the four different themes of four sessions organized in the **GPAI**.

- The summit also included various side events showcasing AI progress and engaging in discussions, such as **industry panel discussions, workshops, research symposiums, hackathons, and the Global AI Expo.**

What is the Delhi Declaration of the GPAI?

- It acknowledges the need to harness new opportunities and mitigate the risks arising from the **development, deployment, and use of Artificial Intelligence (AI).**
- Affirms the commitment to uphold **human dignity, human rights, and democratic values.**
- Emphasizes the importance of fostering **trust, transparency, accountability, and inclusiveness in AI.**
- Recognizes the potential of AI to contribute to the **United Nations Sustainable Development Goals** and address global challenges.
- Encourages **international cooperation and coordination** on AI research, innovation, and policy.
- Supports the development of a **comprehensive framework** that encompasses shared principles for safe and trusted AI.
- Endorses India's proposal to establish and maintain a **Global Digital Public Infrastructure Repository (GDPIR)** to share digital public goods.
 - **GDPIR** was established under the **Ministry of Electronics and Information Technology (MeitY)**, to serve as an extensive repository, consolidating crucial insights and knowledge from both **G20 members and guest nations.**
- Calls for further dialogue on **AI governance** and **ethics** among stakeholders.

What is Artificial Intelligence (AI)?

- AI is the ability of a computer, or a robot controlled by a computer to do tasks that are usually done by humans because they require **human intelligence and judgement.**
 - Although no AI can perform the wide variety of tasks an ordinary human can do, **some AI can match humans in specific tasks.**
- The ideal characteristic of AI is its ability to rationalize and take actions that have the best chance of achieving a specific goal. A subset of AI is **Machine Learning (ML).**
 - **Deep Learning (DL)** techniques enable this automatic learning through the absorption of huge amounts of unstructured data such as text, images, or video.

What is AIRAWAT?

- **NITI Aayog** circulated the cabinet note to establish a **cloud computing platform called AIRAWAT (Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform in 2019).**
- The move to create a **cloud computing platform** is part of the government's goal of making India a pioneer amongst emerging economies with regard to AI and transforming sectors like **education, health, agriculture, urbanization and mobility.**

What is DeepFake?

- **Deepfakes** are synthetic media that use **AI** to manipulate or generate **visual** and **audio** content, usually with the intention of deceiving or misleading someone.
- Deepfakes are created using a technique called **generative adversarial networks (GANs)**, which involve two competing neural networks: a **generator** and a **discriminator.**
 - The generator tries to create **fake images** or **videos** that look realistic, while the discriminator tries to distinguish between the real and the fake ones.
 - The generator learns from the feedback of the discriminator and improves its output until it can fool the discriminator.
 - Deepfakes require a large amount of data, such as photos or videos, of the source and the target person, which are often collected from the internet or social media without their consent or knowledge.
- Deepfakes are a part of Deep Synthesis, which uses technologies, including deep learning and augmented reality, to generate text, images, audio and video to create virtual scenes.

What is the YUVA Ai initiative?

- **About:**
 - The **National e-Governance Division (NeGD)** partnered with **Intel India** to launch '**YUVAi- Youth for Unnati and Vikas with AI**' program.
- **Aims:**
 - To foster a deeper understanding of **AI**, equip school students from **classes 8 to 12** across the nation with relevant mindset and skill sets, and empower them to become human-centric designers and users of AI.

- The program offers an applied learning experience for students to understand and identify how **AI technology** can be used to tackle critical problems and lead to inclusive development of the nation.
- The program will be ongoing throughout the year to give a maximum number of students a chance to empower themselves to be future-ready.

Conclusion

- India launched the GPAI Summit, where India seeks to equip school students with AI skills for inclusive development. The **New Delhi Declaration** emphasizes a global AI framework grounded in democracy, human rights, and responsible practices.

6. Annual Arctic Report Card: NOAA

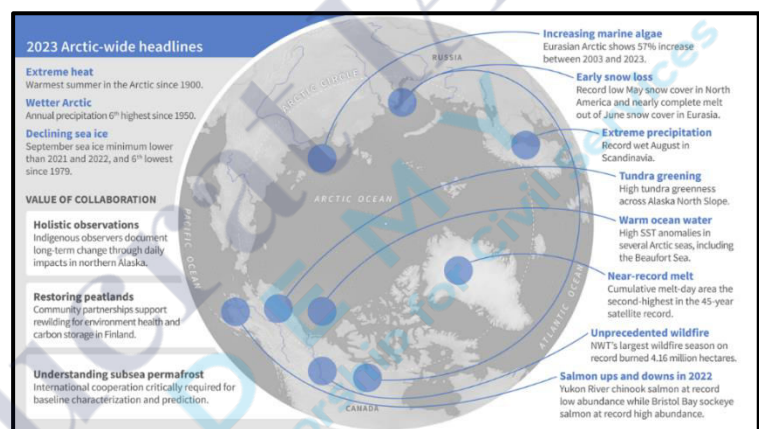
Why in News?

Recently, the **National Oceanic and Atmospheric Administration (NOAA)** has released its 18th Annual Arctic Report Card, highlighting the profound impact of extreme weather and Climate Events on the **Arctic**.

- NOAA is a **United States government agency** that is responsible for providing accurate and timely information about weather forecasts, climate, oceans, coasts, and even the exploration of outer space.

What is the Arctic Report Card?

- It has been Issued annually since 2006, the **Arctic Report Card is a timely and peer-reviewed source** for clear, reliable and concise environmental information on the current state of different components of the Arctic environmental system relative to historical records.



What are the Key Highlights of the Arctic Report Card?

- **Record High Temperatures:**
 - The 2023 summer was the **warmest on record in the Arctic**, which, due to climate change, has warmed nearly four times faster than the globe since 1979.
 - This year was noted as **the sixth warmest in the Arctic since reliable records began in 1900**.
- **Impact of Rising Temperatures:**
 - The soaring temperatures led to **unprecedented wildfires**, forcing community evacuations, a decline in sea ice extent, **severe floods, food insecurity**, and rising sea levels.
 - These impacts directly affect ecosystems, human health, and cultural practices.
- **Thawing of Subsea Permafrost:**
 - Warmer ocean temperatures are **accelerating the thawing of subsea Permafrost**, releasing methane and carbon dioxide.
 - This process contributes to **Global Warming** and exacerbates ocean acidification. There's concern about the unknown extent and impact of these released greenhouse gases.
- **Food Insecurity Due to Salmon Decline:**
 - Western Alaska **experienced significantly reduced populations of Chinook** and chum salmon (81% and 92% below the 30-year mean, respectively), impacting **Indigenous communities reliant on these fish for sustenance**.
 - This decline has cultural, food security, and economic implications.
- **Wildfires in Arctic Regions:**
 - Canada witnessed **its worst wildfire season on record**, affecting 40% of its land mass considered Arctic and Northern.
 - High temperatures and dry conditions facilitated the **burning of over 10 million acres in the Northwest Territories**, leading to evacuations and diminished air quality.
- **Glacier Thinning and Flooding:**
 - Rising temperatures have **led to dramatic thinning of the Mendenhall Glacier**, located in Alaska, over the past 20 years

- As a result, over the years, **the meltaway water has annually caused floods** in the region.
 - One such disaster took place in August 2023, when “a glacial lake on a tributary of the Mendenhall Glacier burst through its ice dam and caused unprecedented flooding and severe property damage” **in Alaska’s Juneau.**
- **Greenland Ice Sheet Melting:**
 - Greenland’s ice sheet experienced melting for only the **fifth time in the 34-year record.** Not only this, the ice sheet continued to lose mass despite above-average winter snow accumulation — between August 2022 and September 2023, it lost roughly 350 trillion pounds of mass. Notably, Greenland’s ice sheet melting is the **second-largest contributor to sea-level rise.**

What is the Arctic?

- The Arctic is a polar region located at the northernmost part of Earth.
- Land within the Arctic region has seasonally varying snow and ice cover.
- It consists of the Arctic Ocean, adjacent seas, and parts of Alaska (United States), Canada, Finland, Greenland (Denmark), Iceland, Norway, Russia, and Sweden.

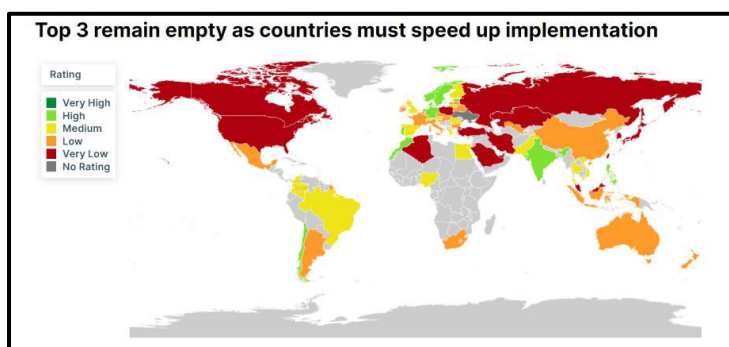
7. Climate Change Performance Index 2024

Why in News?

India’s secured **7th position** in recently released **Climate Change Performance Index (CCPI) 2024** underscoring its notable role and contribution in the ongoing global efforts aimed at mitigating **climate change.**

What are the Major Takeaways From CCPI 2024?

- **About: CCPI, published annually since 2005,** is an independent monitoring tool for tracking countries’ climate protection performance. It increases **transparency in national and international climate policy** and enables comparison of individual countries’ climate protection efforts and progress.
 - It is published by **Germanwatch, the NewClimate Institute, and Climate Action Network International.**
 - It indicates the **climate mitigation efforts of 63 countries and the EU,** which collectively account for over **90% of global greenhouse gas (GHG) emissions.**
- **Performance Metrics:** The CCPI evaluates countries across four key categories: **Greenhouse Gas (GHG) Emissions (40%), Renewable Energy (20%), Energy Use (20%), and Climate Policy (20%).**
- **CCPI 2024:** No country performed well enough in all index categories to achieve an overall very high rating. The **first three overall positions therefore remain empty.**
 - **Denmark** claimed the 4th spot, **Estonia** followed in 5th place, and the **Philippines** secured the 6th position among the top ranks.
- **India’s Ranking in CCPI 2024:** India secured the **7th position** in the **CCPI 2024,** exhibiting a stride forward from **8th spot in CCPI 2023.** Interestingly, due to the **absence of countries in the first three spots,** India effectively stands 4th in global climate performance.
 - **India’s Score and Rankings in Key Categories:**
 - **GHG Emissions & Energy Use:** India ranked **9th in GHG Emissions** and **10th in Energy Use** among assessed countries, largely attributed to its lower per capita energy use, a factor bolstering its climate standing.
 - Also, in the per capita GHG category, the country is on track to meet a benchmark of well below 2°C.
 - **Climate Policy:** India secured the **10th spot in Climate Policy,** showcasing moderate progress compared to its performance in previous assessments.
 - **Renewable Energy:** India’s performance showed a more moderate rank, standing at 37th, barely remaining within the 'high' performance category.
 - This position marks a decline from the **24th spot in CCPI 2023.**
- **Global Context and Comparative Analysis:**



- **Global Trends:** The CCPI report highlighted a concerning trend, despite the urgency to decarbonize, **global GHG emissions have increased in 2022, with atmospheric CO2 levels soaring 50% higher** than pre-industrial levels.
- **G20-performance:** With **India (7th), Germany (14th), and the EU (16th)**, only three G20 countries/regions are among the high performers in CCPI 2024.
 - The G20 members account for **more than 75% of the world's greenhouse gas emissions.**
- **Developed Countries:** Notably, many developed countries including the **United Kingdom, the United States, Italy**, and others showcased poorer performances compared to the CCPI 2023, reflecting a lack of substantial progress in countering climate change.

Note

The report also emphasizes **India's reliance on coal, oil, and gas to meet its energy needs**, despite efforts to promote renewable energy. This reliance contributes significantly to GHG emissions and severe air pollution in cities.

What are the Major Challenges Related to Climate Change in India?

- **Water Scarcity: Changing rainfall patterns and melting glaciers** threaten India's **water security**. According to **NITI Aayog**, best estimates indicate that India's water demand will exceed supply by a **factor of two by 2030**.
- **Agricultural Vulnerability:** Climate change affects crop patterns, **leading to reduced yields** and affecting food security. Increased temperatures and **extreme weather events** like floods and droughts disrupt farming.
 - According to a **2019 study**, extreme weather events cause annual crop losses of about **0.25% of India's GDP**.
- **Rising Sea Levels:** Coastal regions, including major cities like **Mumbai and Kolkata**, face threats from rising **sea levels**. This endangers infrastructure, habitats, and the livelihoods of millions.
 - It is estimated that India could **lose about 1,500 square kilometers of land by 2050** due to erosion caused by rising seas.
- **Air Pollution:** India struggles with **severe air quality issues, primarily due to vehicular emissions, industrial pollution, and crop burning**. Climate change exacerbates this problem, impacting public health and ecosystems.
 - According to a **2022 report**, India's average **PM2.5 concentration was 53.3 micrograms** per cubic meter ($\mu\text{g}/\text{m}^3$). This is more than **10 times the World Health Organization's (WHO) recommended** annual guideline level of $5 \mu\text{g}/\text{m}^3$.
- **Urban Heat Island Effect:** It exacerbates temperatures in cities, leading to an increased frequency and intensity of heatwaves. This **elevates the risk of heat-related illnesses and fatalities**, especially among vulnerable populations living in densely populated urban areas.
 - In 2021, the following four Indian cities were among the top 10 cities for heat exposure: **New Delhi, Kolkata, Mumbai, Chennai**.

What are the Indian Government Initiatives for Climate Change Mitigation?

- **National Action Plan on Climate Change (NAPCC)**
 - National Solar Mission
 - National Mission for Enhanced Energy Efficiency
 - National Mission on Sustainable Habitat
 - National Water Mission
 - National Mission for Sustaining the Himalayan Ecosystem
 - National Mission for A Green India
 - National Mission for Sustainable Agriculture
 - National Mission on Strategic Knowledge for Climate Change
 - Nationally Determined Contributions (NDC)
 - National Adaptation Fund on Climate Change (NAFCC)
 - State Action Plan on Climate Change (SAPCC)
- **National Adaptation Fund on Climate Change (NAFCC)**
- **Panchamrit Goal**

Way Forward

- **Climate-Resilient Crop Varieties:** Investing in research and development of genetically modified or selectively bred **climate-resilient crop varieties** tailored to withstand extreme weather conditions, ensuring food security despite changing climate patterns.

- **Vertical Forests in Urban Areas:** Constructing **vertical forests within urban spaces** to enhance green cover and biodiversity while mitigating the urban heat island effect. These structures consist of multiple levels of vegetation on building exteriors, offering ecological benefits and improving air quality.
- **Floating Solar Farms:** Creating **floating solar farms on water bodies like lakes and reservoirs** to generate renewable energy. This innovative approach optimizes land use, reduces evaporation from water surfaces, and produces clean energy.
- **Community-Based Climate Insurance:** Implementing community-driven climate insurance schemes that **involve local communities in risk-sharing and climate adaptation strategies**. This helps vulnerable populations recover from climate-related disasters.
- **Blockchain for Carbon Credits:** Utilizing blockchain technology to create transparent and efficient carbon credit systems. This would enable **accurate tracking and trading of carbon credits**, encouraging businesses and individuals to invest in emission reduction projects.
- **Seaweed Farming for Carbon Capture:** Encouraging **seaweed farming as a method of carbon sequestration**. Seaweed absorbs carbon dioxide during growth and can be harvested for various purposes while helping mitigate climate change.
- **Incentivizing Climate-Smart Transportation:** Implementing incentive-based programs to **promote climate-smart transportation**, such as offering tax benefits or subsidies for **electric vehicles**, cycling infrastructure, or carpooling initiatives.

8. India's Maiden Winter Arctic Research

Why in News?

Recently, the Union Minister of Earth Sciences flagged off India's first **winter scientific expedition** to **Himadri**, the nation's **Arctic Research Station** situated in **Ny-Ålesund** within the Norwegian archipelago of Svalbard in the **Arctic**.

- The first batch of the maiden Arctic winter expedition comprises researchers from the host **National Centre for Polar and Ocean Research (NCPOR)**, Indian Institute of Technology (IIT) Mandi, Indian Institute of Tropical Meteorology (IITM) and **Raman Research Institute**.

What is the Importance of The Winter Arctic Scientific Expedition?

- Indian scientific expeditions to the **Arctic** during the **winter** will allow researchers to conduct unique scientific observations during **polar nights**, where there is **no sunlight for nearly 24 hours** and **sub-zero temperatures**.
- It opens more avenues for India to expand our scientific capabilities in Earth's poles.
- This will aid in expanding understanding of the Arctic, especially **climate change, space weather, sea-ice and ocean circulation dynamics, ecosystem adaptations**, etc. which affect **weather and climate** in the tropics, including monsoons.
- India has operated a research base in the Arctic named **Himadri** since **2008**, which has been mostly hosting scientists during the summer (April to October).
- Priority research areas include **atmospheric, biological, marine, and space sciences, environmental chemistry, and studies on cryosphere, terrestrial ecosystems, and astrophysics**.
- India will join a small group of countries that operate their Arctic research bases through the winter.
- In recent years, **climate change and global warming research** has been attracting scientists to the **Arctic region**.

What is the Impact of Warming on the Arctic?

- Temperatures in the **Arctic region** have risen by about **4 degree Celsius** on average over the last 100 years 2023 was the warmest year on record.
- The extent of **Arctic sea-ice** has been declining at the rate of **13%/decade**, according to **the Intergovernmental Panel on Climate Change**.
- The **melting sea ice** can have global impacts reaching beyond the **Arctic region**.
- **Rising sea levels** can influence **atmospheric circulation**.
- An increase in **tropical sea surface temperatures** could lead to increased precipitation in the tropics, a shift in the **Inter Tropical Convergence Zone** and high chances of an increase in **extreme rainfall events**.
- Milder weather due to **global warming** could make the Arctic a more habitable and a less hostile place.



- There could be a rush to explore and exploit the **Arctic's resources**, including its minerals, and countries will seek to control trade, navigation and other strategic sectors in the region.

Note

- **Dakshin Gangotri in Antarctica** was set up much earlier in **1983**. **Dakshin Gangotri** is now submerged under ice, but India's two other stations, **Maitri** and **Bharti**, are in use.
- **Indian scientific expeditions** to the Earth's poles (the Arctic and the Antarctic) are facilitated under the **PACER (Polar and Cryosphere) scheme** of the **MoES**, solely through the aegis of the **National Centre for Polar and Ocean Research (NCPOR)**, Goa, an autonomous institution of the **MoES**.



PRELIMS BOOSTER-THE HINDU & INDIAN EXPRESS

1ST DECEMBER

1. Press mud: Sugarcane by product press mud can help generate 460,000 tonnes of compressed biogas Compressed Bio-Gas (CBG) valued at Rs 2,484 crore.

- Press mud is the **residual solid product** obtained from **sugarcane juice** before crystallisation of sugar.
- **Bagasse, molasses and press-mud** are major waste products obtained from sugar industry.
- **Benefits of Press-mud**
 - Act as **feedstock for biogas production** through anaerobic digestion and subsequent purification to create CBG.
 - **Improves soil structure, air circulation, and water retention capacity of soil.**
- **Concern:** Long term storage of press mud leads to gradual decomposition, resulting in breakdown of organic compounds.

2. Bandipur Tiger Reserve (BTR): A barren patch on fringes of BTR has been transformed into an orchard.

- Lies in **Western Ghats Mountains Biogeography Zone.**
- Forms part of **Nilgiri Biosphere Reserve** and is surrounded by **Mudumalai Tiger Reserve in South, and Wayanad Wildlife Sanctuary in South West.**
- On North West Side, **Kabini reservoir separates Bandipur from Nagarhole Tiger Reserve.**
- Landscape of Bandipur, Nagarahole, Mudumalai & Wayanad complex hosts single largest Asian Elephant population in world and is part of Mysore Elephant Reserve.
- **Flora:** Vegetation changes from scrub type to moist deciduous type from east to west.
- **Fauna:** Asian Elephant, Sloth Bear, Gaur, Four-horned antelopes etc.

3. Comet P12/Pons-Brooks: Astronomers have photographed the **enigmatic Comet P12/Pons-Brooks** from the **Indian Astronomical Observatory in Hanle, Ladakh** using the Himalayan Chandra Telescope.

- A celestial object that has been playfully nicknamed the '**Devil Comet**' or likened to the '**Millennium Falcon**' for its distinctive appearance.
- This **comet, first discovered in the year 1812,** completes an orbit around the Sun in around 71 years.
- **Himalayan Chandra telescope**

- It is a **2-meter optical-infrared telescope.**
- It is at an **altitude of 4500m** and operated by **Indian Institute of Astrophysics, Bengaluru.**

4. Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM JANMAN): Union Cabinet has approved PM JANMAN with total outlay of Rs. 24,104 crore.

- Funds will be made available to implement the Mission in next three years under Development Action Plan for Scheduled Tribes.
- **PM JANMAN aims to protect the tribes on the verge of extinction and nurture them.**
- It will **cover 75 Particularly Vulnerable Tribal Groups (PVTGs)** residing in 18 states and union territories.
- **PM-JANMAN will focus on 11 critical interventions through nine ministries, including Ministry of Tribal Affairs,** which includes connecting roads, safe housing, Water supply, Health facilities, vocational education and skilling, etc

2ND DECEMBER

1. Nagarjuna Sagar Dam: Nagarjuna Sagar is the **largest and highest masonry dam in the world.**

- It took its name from the **great Buddhist scholar Nagarjuna.**
- Nagarjuna Sagar Dam is located on the **Krishna River,** straddling the **borders of Nalgonda and Guntur districts.**
- **Objective:** Multi-purpose irrigation and hydroelectric project, **termed as one of the Modern Temples of India.**
- The **Ethipothala waterfalls as well as the Srisailem Wildlife Reserve** are found within the vicinity of the dam.
- As per the provisions of the Andhra Pradesh Reorganisation Act, 2014, **Nagarjunasagar dam is controlled and supervised by Telangana**
- Andhra Pradesh was given the control over Srisailem project.

2. Booker Prize: Irish novelist Paul Lynch won the Booker Prize in 2023 for his 5th novel '**Prophet Song**'.

- **Founded in 1969,** the Booker Prize is open to English-language novels from any country that have been published in Britain and Ireland.
- It **aimed to stimulate the reading and discussion of**

contemporary fiction.

- Some Indian-origin authors who won the prize include **VS Naipaul (1971), Salman Rushdie (1981),**

Arundhati Roy (1997), among others.

- **Note:** Booker Prize is given for fiction books written in English only whereas International Booker Prize is awarded for books translated into English.

3. Exit polls: Recently, Election Commission of India (ECI) rescheduled the timeline for publication of exit polls for the General Elections to the Legislative Assemblies.

- An exit poll is a **poll of voters taken immediately after they have exited polling stations.**
- Guidelines for conduct and publication of exit poll results are **issued by the ECI under Article 324 and Section 126A of the Representation of People (R.P) Act, 1951.**
- **Section 126A (1) of R.P. Act, 1951** prohibits conducting, publishing, or disseminating exit poll results during a period notified by the Election Commission.

4. Sindhurg Fort: Indian Navy will conduct 'Operational Demonstration' covering naval operations by the ships and aircraft at Sindhurg Fort.

- **About Sindhurg Fort (means 'Sea Fort').**
 - Historical fort that occupies an **islet in Arabian Sea, off the coast of Malvan town, Maharashtra.**
 - Built by **Maratha Ruler Chhatrapati Shivaji.**
 - Its **construction began in 1664** and was completed after 3 years.
 - Its main entrance is concealed in such a way that no one can locate it from outside.
 - Fort houses a **handprint and a footprint of Shivaji Maharaj** etc.

4TH DECEMBER

1. Leadership Group for Industry Transition (LeadIT 2.0): Prime Minister with his Sweden counterpart co-launched the **Phase-II of the LeadIT**

- LeadIT was **launched by India and Sweden** at the **UN Climate Action Summit in 2019.**
- It brings together countries, companies and industry experts to achieve net-zero emissions from heavy industries by 2050.
- **LeadIT 2.0 will focus on**
 - Inclusive and Just Industry Transition
 - Low Carbon Technology Development and Transfer
 - Emerging Economy Technology Transfer
- **India and Sweden also launched the Industry Transition Platform.**
 - It will connect governments, industries, technology providers, researchers and think tanks of the two

countries

2. Anthrobots: Scientists have developed anthrobots.

- These are **tiny robots made of human cells** that are able to repair damaged neural tissue.
- They can be created from **adult human cells without genetic modifications.**
- They can be **fused together to form a superbot.**
- This development represents a significant advancement in regenerative medicine.
- **Regenerative medicine is the process of replacing or regenerating human cells, tissues or organs** to restore or establish normal function.
- Anthrobots are different from xenobots, which are derived from embryonic stem cells of frog

3. Kaziranga National Park (KNP): Recently, one-horned rhinoceros was killed in KNP of Assam.

- It is **part of Eastern Himalayan biodiversity hotspots.**
- It lies between Brahmaputra River (North) and the Karbi Anglong hills (South).
- **In 1985, declared as a World Heritage Site by UNESCO.**
- Inhabited by world's largest population of one-horned rhinoceroses.
- **Vegetation:** It ranges from alluvial inundated grasslands to tropical semi-evergreen forests.
- **Fauna:** Hoolock Gibbon, Tiger, Leopard, Indian Elephant, Sloth Bear, etc

4. Hydrogen for Heritage scheme: India proposed to invite global firms to manufacture Hydrogen trains for implementing the Hydrogen for heritage scheme.

- It was **announced in the Union Budget 2023-24.**
- Under it, **Indian Railways (IR) has envisaged to run 35 Hydrogen trains.** Also, IR will undertake retrofitment of Hydrogen Fuel cell on existing Diesel Electric Multiple Unit (DEMU).
- **Hydrogen fuel cells use the chemical energy of hydrogen to produce electricity.**
- **Benefits:** It will promote green transportation technology that will support zero carbon emission goals.

5TH DECEMBER

1. Biotechnology Research and Innovation Council (BRIC): Recently, the Union Minister of State for Science & Technology addressed the first-ever meeting of the BRIC Society.

- BRIC is an **apex autonomous Society** formed after the **rationalization of 14 autonomous institutions of the Department of Biotechnology.**
- It **aims to achieve centralized and unified governance** to maximize the impact of biotech

research across the country

2. National Financial Reporting Authority (NFRA): National Company Law Appellate Tribunal (NCLAT) has upheld the penalty imposed by **NFRA on auditors of Dewan Housing Finance Corporation Ltd (DHFL).**

- **Genesis:** It is constituted under the Companies Act, 2013.
- **Objective:** To improve quality of all corporate financial reporting in India.
- It **oversees compliance with Accounting and Auditing Standards** by companies that can be described as Public Interest Entities (PIEs).
- This group includes all listed companies, and large unlisted companies.
- **Ministry:** Ministry of Corporate Affairs

3. WHO's Annual Malaria Report 2022: In 2022, there were an estimated 249 million malaria cases globally.

- **India accounted for 66% of malaria cases in the WHO South-East Asia Region.**
- India saw a 30% decline in malaria cases and 34% decline in deaths in 2022 as compared to 2021.
- The report cites achievements such as the **rolling out of WHO-recommended malaria vaccines RTS,S/AS01 and R21/ Matrix-M.**
- **About Malaria**
 - It is caused by plasmodium parasites.
 - It is transmitted through the bites of female Anopheles mosquitoes.

4. AUKUS: AUKUS (Australia, United Kingdom, and United States) group has signed agreement to jointly operate Deep Space Advanced Radar Capability (DARC).

- DARC will enhance collective space domain awareness.
- **About AUKUS:**
 - It is a **trilateral security partnership, launched in 2021.**
 - It is **intended to strengthen the ability of each government to support security and defense interests** (such as providing nuclear submarine to Australia).
 - It will promote deeper information sharing and technology sharing; and foster deeper integration etc.

6TH DECEMBER

1. International Social Security Association (ISSA): Employees' State Insurance Corporation (ESIC) bags "ISSA Vision Zero 2023" Award at **23rd World Congress on Safety and Health at Work in Sydney, Australia.**

- Headquartered at Geneva, Switzerland, it was **founded in 1927 under auspices of International Labour Organization.**
- It is the **world's leading international organization for social security institutions**, government departments and agencies.
- It **aims to promote dynamic social security** as the social dimension in a globalizing world by supporting excellence in social security administration.
- India is a member

2. Accredited Compensatory Afforestation (ACA): Ministry of Coal has proposed **579 hectares of reclaimed land under ACA program.**

- ACA, introduced under **Forest (Conservation) Rules, 2022**, is a system of proactive afforestation to obtain approval for non-forestry use of forest land.
- Under ACA people and government entities can raise vegetation on fallow land and sell it to project developers who need to meet CA targets.
- Before this, Forest Department undertook compensatory afforestation (CA) only after approval of diversion of forest land for non-forestry use.
- **CA is mandatory under Forest (Conservation) Act, 1980 for non-forestry use of forestland**

3. Mitochondrial DNA (mt DNA): Scientists used mt DNA to trace the origins of mummified baboons in Ancient Egypt.

- Mt DNA is a **circular chromosome found in a cellular organelle called Mitochondria**
- Mitochondria are the **site of the cell's energy production and other metabolic functions** (hence also known as the powerhouse of the cell).
- They are **found in the cytoplasm of cells.**
- Offsprings receive mitochondria and, consequently, mitochondrial DNA from their mother.
- Nuclear DNA is found in the cell nucleus and inherited equally from both parents.

4. Africa Green Industrialisation Initiative (AGII): African leaders launched **AGII at 28th Conference of Parties (COP28).**

- AGII **aims to accelerate green growth of industries in Africa** and attract finance and investment opportunities.
- It incorporates elements of **Sustainable Development Goals and Paris Agreement**, discourages use of fossil fuel and its production which causes global warming.
- It marks a concrete step toward realization of Nairobi Declaration, activating private sector-led scaling-up of green industrial clusters.

7TH DECEMBER

1. Privilege Committee: Rajya Sabha passed a motion to end suspension of an Member of Parliament (MP) following a recommendation by privileges committee.

- It is a **parliamentary standing committee present in both Houses of Parliament.**
- Consists of **15 members in Lok Sabha** (10 in case of Rajya Sabha) **nominated by the Speaker** (Chairman in case of Rajya Sabha).
- **Key Function:** Investigate questions involving the breach of privileges of House or members, as referred to it by presiding officer of Houses.

2. Open Source Software (OSS): Meta and IBM formed the AI Alliance, supporting an **open-source approach to AI development.**

- OSS, like **Linux and Mozilla**, are developed via **open collaboration**, and their source code is available for anyone to use, examine, alter and redistribute.
- **OSS differs from closed-source software like Microsoft Word**, which are sold to end users by the creator or copyright holder.
- **Closed-source software cannot be edited, enhanced or redistributed** except as specified by the copyright holder.
- **India has adopted a policy on adoption of OSS and established National Resource Centre for Free & Open-Source Software** to support OSS ecosystem

3. Chandrayaan-3 Propulsion Module: ISRO has successfully returned the Chandrayaan-3's Propulsion Module from lunar orbit to Earth's orbit.

- It is a **milestone in ISRO's goal to bring back manned missions in the future.**
- It marks the **first instance of bringing an object back from lunar orbit.**
- It is also **ISRO's first demonstration of a gravity assist flyby** around another celestial body.
- It is a technique of using a planet's or celestial body's gravity to redirect and accelerate a spacecraft toward Earth.
- Payload **SHAPE** onboard the module will continue to conduct a spectroscopic study of Earth's atmosphere from Earth's orbit.

4. Gram Manchitra: Ministry of Panchayati Raj (MoPR) is promoting **Gram Manchitra to facilitate Spatial Planning by the Gram Panchayat**

- It is a **Geographic Information System (GIS) Application**, launched by MoPR in 2019.
- It has been **developed by National Informatics**

Centre (NIC).

- It **helps to perform spatial planning at Gram Panchayat level** with use of geo-spatial technology.
- It **provides single Geo Spatial platform** to better visualize various developmental works and provide a decision support system for Gram Panchayat Development Plan

8TH DECEMBER

1. NOTA (None of the Above) option in elections: NOTA is one of the options available in the Electronic Voting Machine.

- If a voter does not support any of the candidates contesting in the election, they have the option to select **NOTA.**
- It was **introduced following the 2013 Supreme Court directive in the PUCL versus Union of India case.**
- There is **no provision for re-polling** in a constituency even if **NOTA** gets the most votes.
- SC ruled that the **NOTA option is applicable only for direct elections** and not indirect elections such as the Rajya Sabha polls

2. Miyawaki Plantation Method: South Eastern Coalfields Ltd (SECL) will undertake **plantation using Miyawaki method in coal belt region of Chhattisgarh.**

- Pioneered by **Japanese botanist Akira Miyawaki.**
- Involves **planting native trees, shrubs and groundcover plants within every square meter to create a dense canopy layer of tall trees in small land parcels.**
- Species chosen are plants which can survive harsh weather and water-scarce conditions.
- **Benefits of the method:** Forests grow rapidly; Utility in urban forestry; increase carbon sequestration, reduce air and noise pollution and attract local birds and insects

3. National Automated Fingerprint Identification System (NAFIS): As of 2023, **NAFIS has been established at 1022 locations across the country.**

- NAFIS is a **country-wide searchable database of crime- and criminal-related fingerprints**
- It is managed by the **National Crime Record Bureau** at the Central Fingerprint Bureau.
- It assigns a unique 10-digit National Fingerprint Number (NFN) to each person arrested for a crime.
- **NAFIS provide the much-needed unique identifier for every arrested person in the CCTNS** (Crime and Criminal Tracking Network & Systems) database as both are connected at the backend

4. Diel Vertical Migration (DVM): DVM is synchronised movement of deep-sea marine animals up and down in oceanic water column over a daily cycle.

- Free-floating zooplanktons swim up to food-rich surface waters at night to feed when light is scarce and they are “hidden” from predators.
- They return to the depths before sun rises.
- DVM plays a **pivotal role in sequestering carbon.**
- **Animals remove substantial amounts of carbon from Upper Ocean** as they feed on surface-dwelling plankton.
- When these organisms return to deeper waters, they carry carbon with them.

9TH DECEMBER

1. Mera Gaon Meri Dharohar (MGMD) Project: Launched by the Ministry of Culture (MoC) to document and map the cultural diversity inherent in villages across the country.

- Mapping is done under the **National Mission on Cultural Mapping (NMCM), in coordination with the Indira Gandhi National Centre for the Arts (IGNCA).**
- MGMD seeks to compile comprehensive information detailing the **life, history, and ethos of Indian villages.**
- **NMCM:** Launched to develop a comprehensive database of artists, art forms, and cultural resources gathered from organizations, Ministries, and States

2. Meftal: The Indian Pharmacopoeia Commission (IPC) has issued a drug safety alert regarding **Adverse Drug Reactions (ADR) associated with the painkiller Meftal.**

- Meftal contains **mefenamic acid and is commonly used for menstrual cramps and rheumatoid arthritis.**
- It can trigger adverse reactions like **DRESS syndrome.**
- Drug rash with eosinophilia and systemic symptoms (DRESS) syndrome is a **severe idiosyncratic response to a medication, marked by a protracted onset period.**
- IPC is an Autonomous Institution of the Ministry of Health and Family Welfare to set standards of drugs.

3. Mycoplasma pneumonia: Pneumonia cases in AIIMS Delhi have no link to recent surge in respiratory infections in children in China.

- Mycoplasma pneumoniae bacteria commonly cause mild infections of respiratory system (throat, lungs, windpipe).

- It is **one of smallest self-replicating organism**, has a highly stable genome, lacks cell wall and grows slowly.
- It is a **common bacterial cause of community acquired pneumonia.**
- It spreads by coughing or sneezing

4. Urban flood mitigation project: Prime Minister has approved the **urban flood mitigation project under National Disaster Mitigation Fund (NDMF)**

- It is for **‘Integrated Urban Flood Management (IUFM) activities for Chennai Basin Project’.**
- This mitigation project will help make **Chennai flood-resilient.**
- This is the **first in a series of urban flood mitigation efforts and will help develop a broader framework for urban flood management”.**
- **IUFM is a holistic approach that stresses on the interrelationship between socioeconomic development, environmental sustainability, and flood-risk management.**

11TH DECEMBER

1. Green Rising Initiative: UNICEF's Generation Unlimited, in collaboration with India's Ministry of Environment, Forest, and Climate Change, introduced "Green Rising" initiative at COP28.

- Aim to **empower youth-led climate actions and solutions.**
- It was launched at **Dubai Cares (philanthropic organization) hosted RewirEd Summit.**
- RewirEd Summit at COP28 is first ever global summit on education and climate.
- Earlier in 2018, UN Secretary-General launched Generation Unlimited.
- It is a **global Public-Private-Youth Partnership, to co-create and deliver innovative solutions on global scale**

2. City of Lakes Project and 3i model: At a discussion held by C40, **Delhi's breakthroughs in fighting climate change like City of Lakes project and 3i model were mentioned.**

- C40 is a **global network of nearly a hundred mayors of world's leading cities that are united inaction to confront climate crisis.**
- Delhi's 3i model for Electric Vehicles focuses on **Inclusion, incentivization, and Innovation.**
- **City of lakes aims to rejuvenate water bodies in city.**
- It **creates eco-tourism opportunities and enhances heat resilience,** particularly during extreme weather events.
- It led to an increase of up to 2 meters in

groundwater levels.

3. Agni-1: Training launch 'Agni-1' was carried out successfully from **APJ Abdul Kalam Island, Odisha**.

- Agni-1 is **Short-Range Ballistic Missile and is a very high precision missile system**.
- Range capacity: over 700 Kms.
- It is **nuclear-capable, road-mobile missile**.
- **First deployed in 2007**.
- Agni-1 to 5 missiles are designed & developed by Defence Research & Development Organisation (DRDO).

4. Climate Change Performance Index (CCPI) 2024:

India this year further improved its global CCPI ranking by securing 7th position (last year it was 8th).

- Released by **Germanwatch**.
- CCPI is an **independent monitoring tool for tracking the climate protection performance**.
- **It assesses countries performance in four categories:**
 - GHG emissions (40% of the overall score),
 - Renewable energy (20%),
 - Energy use (20%),
 - Climate policy (20%).
- Top three places i.e 1-3 are vacant in CCPI.
- **Germanwatch also releases The Global Climate Risk Index**

12TH DECEMBER 2023

1. Cloud Facility for the Financial Sector: RBI proposed to establish cloud facility for financial sector data in India.

- Aims to enhance **security, integrity and privacy of financial sector data**.
- Initially to be operated by **Indian Financial Technology & Allied Services (IFTAS), a subsidiary of RBI**.
- Later to be transferred to a separate entity owned by financial sector participants.
- **Significance**
 - Banks and financial entities are maintaining large volume of data.
 - Cloud technology is known to enhance privacy through its centralised security, and guard against cybercrimes.

2. Koya Tribe: In recent time, **Koya Tribe has made an exemplary transition by shedding the use of bison horns to make their traditional Permakore flute**.

- **Geographical distribution:** Hilly and forested regions of Andhra Pradesh, Odisha and Chhattisgarh.
- **Language:** Mother tongue is Gondi (Dravidian

language), also speak Odia and Telugu languages.

- **Livelihood:** Traditionally they are pastoralists and shifting cultivators.
- **Culture:**
 - Practices Kommu Koya dance.
 - **Pendul is commonly practiced form of marriage**.

3. Banni Grassland (Gujarat): Central government has approved setting up a cheetah breeding and conservation centre in Banni Grassland.

- **Geography:** Arid grassland located in Kutch district with an area of over 2500 sq.km.
- **Biodiversity:** Consisting of two ecosystems in juxtaposition, viz., wetlands and grasslands.
- **Flora:** Over 190 species of plants like invasive Prosopis juliflora tree.
- **Fauna:** Mangrove dwelling Kharai camel (swimming camel); domesticated animals like Banni buffalo, Kankrej cow etc.
- **Livestock breeders of Banni are called Maldharis**.

4. Impatiens karuppusamy: This new plant species was recently discovered by the **Botanical Survey of India in Kalakad Mundanthurai Tiger Reserve, Tamil Nadu**.

- Species is named after **Dr. S Karuppusamy (Madhura College, Tamil Nadu)** for his significant contributions to the taxonomy of south Indian angiosperms.
- **Morphology:** The species, resembling Impatiens Bicornis, distinguishes itself with small leaves, six to eight-flowered, short scape, and small flowers.
- **Distribution:** Although widely distributed in tropical Africa, Madagascar, India, Sri Lanka, and China, Impatiens are restricted to certain areas and can become extinct due to climate change.

14TH DECEMBER

1. Women's reservation in legislations: Centre introduced the Jammu and Kashmir Reorganisation(Second Amendment) Bill, 2023 to reserve **33% of seats in the Jammu and Kashmir assembly for women**.

- Centre also introduced the **Government of Union Territories (Amendment) Bill, 2023 to reserve 33% of seats in the Puducherry Assembly for women**.
- **Nari Shakti Vandan Adhiniyam 2023**, passed recently, provides 33% reservation to women in the Lok Sabha and State Assemblies.

2. Pliosaur Fossil: Recently, skull of an ancient sea animal called a **Pliosaur has been extracted from U.K.'s Jurassic Coast**.

- Pliosaurs were **large carnivorous marine reptile** characterized by massive heads, short necks, and streamlined tear-shaped bodies.
 - Pliosaurs have been found as fossils from **Jurassic and Cretaceous periods** (about 200 million to 65 million years ago) of the Mesozoic Era.
- 3. Anthrax:** WHO reported that **five countries in East and Southern Africa have anthrax disease outbreak.**
- **Nature:** Infectious disease caused by spore-forming bacteria called *Bacillus anthracis*.
 - **Affect:** Livestock like cattle, sheep and goats, as well as wild herbivores.
 - Humans can catch the disease from infected animals or through contaminated animal products.
 - **Treatment:** Anthrax vaccines for livestock and humans exist.
 - **Biological Weapon:** In 2001, anthrax-laced letters killed 5 and sickened 17 in United States.

- 4. National Asset Reconstruction Company Limited (NARCL):** Government informed that **10 Public Sector Banks transferred Non-Performing Assets (NPA)** of over Rs 11,617 crore to NARCL between January and November this year.
- NPA refers to **credit for which payment of interest or principal has remained 'past due' for a specific period.**
 - NARCL is registered with the RBI as an **Asset Reconstruction Company under SARFAESI Act, 2002.**
 - It was established to clean up the legacy stressed assets with an exposure of Rs 500 crore and above in Indian Banking system.
 - It intends to acquire these through 15% Cash and 85% in Security Receipts

15TH DECEMBER

- 1. Pangolakha Wildlife Sanctuary:** Recently, a Royal Bengal Tiger was spotted at Pangolakha Wildlife Sanctuary in Sikkim.
- **IUCN Status of Royal Bengal tiger is 'Endangered'.**
 - **About Wildlife sanctuary:**
 - It lies in the **Pangolakha Range of Himalayan Mountains.**
 - This range separates Sikkim from Bhutan.
 - Neora Valley National Park (West Bengal) links it with Toorsa Strict Reserve of Bhutan.
 - **Forest Type:** Subtropical Pine Forest, Subtropical Broadleaf Hill Forest and Alpine Moist Pasture.
 - **Fauna** - Brown dipper, Red panda, Snow leopard etc.
 - **Key river:** Chukha

- 2. AKTOCYTE:** AKTOCYTE (nutraceutical tablets) has shown remarkable results in enhancing the quality of life for cancer patients.
- Nutraceutical refers to a **food products that provides medical or health benefits, including the prevention and treatment of disease.**
 - It **minimizes side effects of radiotherapy.**
 - Radiotherapy is a cancer treatment that uses high doses of radiation to kill cancer cells and shrink tumors.
 - **Developed by:** Department of Atomic Energy along with private pharma company.
 - It is **approved by Food Safety and Standards Authority of India (FSSAI).**

- 3. Currency Devaluation:** Argentina has devalued its currency Argentine Peso to handle the economic crisis.
- Devaluation is the **deliberate attempt by the government or central bank to lower its currency value.**
 - **Advantages:** Promotes exports, reduction in trade deficit etc.
 - **Disadvantages:** Raises the value of external debt, etc.
 - On the other hand, Depreciation refers to decrease in the value of currency with respect to other currencies mainly due to market forces

- 4. Chilika Lake:** A new species of marine amphipod '*Demaorchestia alanensishas*' been found in Chilika Lake (Odisha).
- Amphipods are **member of the invertebrate order Amphipoda (class Crustacea).**
 - It is **Asia's largest brackish water and world's second largest coastal lagoon.**
 - It was **first Indian Wetland of International Importance (WII) under Ramsar Convention.**
 - It was **first site in Asia which was removed from Montreux Record (MR) in 2002.**
 - MR is register of WII where changes in ecological character have occurred or are likely to occur.
 - It is **famous for Nalabana Bird Sanctuary and Irrawaddy dolphin.**

16TH DECEMBER

- 1. Haemophilia:** Haemophilia and Health Collective of North (HHCN) proposed new guidelines for treatment of Persons with Haemophilia (PwH) in India.
- Haemophilia is a **bleeding disorder in which the blood does not clot properly.**
 - It is usually inherited with an **X-linked recessive inheritance pattern.**
 - It is caused by mutation in one of the genes that

provides instructions for making clotting factor proteins needed to form a blood clot.

- **These genes are located on the X chromosome.**
- Acquired haemophilia is a separate non-inherited condition

2. Inverted Duty Structure (IDS): Union Ministry of Commerce and Industry submitted a list of items to Ministry of Finance to address IDS.

- IDS refers to a **tax structure where taxation on imports of inputs is at higher rates than finished products.**
- Free Trade Agreement pacts signed by India with its partner countries is one of the reasons for IDS.
- **Impact of IDS**
 - IDS go against the 'Make in India' initiative as it encourages import of finished products.
 - Adversely impacts the export competitiveness.
 - IDS may also result in reduced tax revenue as domestic production declines

3. De-registration of political parties: Delhi High Court rejected a PIL to de-register political parties registered with names having religious, caste, ethnic, and linguistic connotations.

- Political Parties in India are registered with **Election Commission of India (ECI) under Section 29A of Representation of People Act (RPA), 1951.**
- However, RPA 1951 does not provide any mechanism to deregister political parties.
- **Law Commission (255th and 170th reports) on electoral reforms have recommended granting ECI power to deregister a party in cases of non-compliance.**

4. Asymmetric federalism: In recent judgement, Supreme Court held that **Article 370 was a feature of asymmetric federalism and not sovereignty.**

- Federalism is a system of government in which **power is divided between a central authority and various constituent units of the country.**
- Asymmetric federalism is understood to mean **federalism based on unequal powers and relationships in political, administrative and fiscal arrangements spheres between the units constituting a federation.**
- India is said to be Asymmetric federal as there are special provisions applicable to some States/regions. e.g. north eastern states.

18TH DECEMBER

1. Kyasanur Forest Disease (KFD): Recently, a death has been reported in Karnataka due to KFD virus (KFDV).

- It derives its name from **Kyasanur Forest Range of Karnataka** where it was first spotted.
- It is a **zoonotic disease caused by KFDV.**
- KFDV is transmitted through the bite of ticks.
- It is also **known as Monkey Disease/Monkey Fever** as Bonnet, and black-faced langur monkeys are highly susceptible.
 - They play a significant role in the spread of the virus in the human population

2. Dark Fibre: Securities Appellate Tribunal (SAT) has quashed SEBI's order of imposing a fine on the National Stock Exchange in the dark-fibre case.

- A dark fibre (unlit fibre) is an **unused optical fibre which is not connected to any active equipment or has no traffic or service running on it.**
- They are named dark because **no light pulse is transmitted through these cables.**
- Even after these fibres are used, they are referred as dark fibre, as they are independent of other network cables.
- **Benefits:** Low latency, high security etc.

3. Sovereign Gold Bond (SGB) Scheme: Government announced to bring Series III of Sovereign Gold Bond Scheme (SGBs) (2023-24).

- **Objective:** Reduce the demand for physical gold.
- SGB are **government securities and issued under Government Securities Act, 2006.**
- **Issued by:** RBI on the behalf of Government of India.
- SGBs are restricted for **sale to resident individuals, Hindu Undivided Family (HUFs), Trusts, Universities and Charitable Institutions.**
- **Tenor:** Period of eight years (has premature redemption after 5th year)
- **Minimum investment:** One gram.
- **Maximum limit:** 4 Kg for individual, 4 Kg for HUF and 20 Kg for trusts per fiscal year.

4. Tax Inspectors Without Borders (TIWB): TIWB launched a programme in Saint Lucia and India has been chosen as the Partner Administration. India will provide Tax Experts for this program

- It is a **joint initiative of the Organisation for Economic Cooperation and Development (OECD) and the United Nations Development Programme (UNDP).**
- It facilitates the transfer of tax audit knowledge and skills to developing country tax administrations using a practical, "learning by doing" approach.

19TH DECEMBER

1. Kakrapar-4 nuclear reactor attains criticality: Criticality refers to a condition in nuclear reactor

operations where the number of neutrons produced by fission reactions is sufficient to sustain a self-sustaining chain reaction.

- Kakrapar (located in Gujarat) is the **largest indigenous nuclear power reactor, built by Nuclear Power Corporation of India Limited (NPCIL).**
- NPCIL is a public sector undertaking of Department of Atomic Energy.
- **Kakrapar-4 is the second in the series of sixteen indigenous Pressurised Heavy Water Reactors (PHWR) of 700 MW each being set up in the country.**

2. Kashi Tamil Sangamam 2023: The Prime Minister inaugurated the Kashi Tamil Sangamam 2023 in Varanasi.

- It aims to celebrate, reaffirm and rediscover the age-old links between Tamil Nadu and Kashi.
- It was held for the first time in 2022 to further the spirit of 'Ek Bharat, Shrestha Bharat.'
- Ministry of Education will be the nodal agency for this event with participation from the other ministries such as Ministries of Culture, Tourism, Railways, Textiles, etc.

3. Cassini mission: According to a new study based on data from NASA's Cassini spacecraft, Scientists found hydrogen cyanide in oceans of Saturn's icy moon Enceladus.

- **Hydrogen cyanide is a key molecule in creation of life.**
- **Cassini mission was launched in 1997.**
- It was designed to explore the Saturn system, including its rings and moons, with a special focus on Titan.
- It carried Huygens lander, which landed on Saturn's largest moon, Titan.
- It was a **joint endeavor of NASA, ESA (European Space Agency), and Italian space agency (ASI).**

4. Goldilocks Zone (Habitable zone): New NASA study has discovered 17 ocean planets in habitable zones of distant stars that could have oceans of liquid water beneath their icy shells.

- Goldilocks zone is the **area around a star where it is not too hot and not too cold for liquid water to exist on the surface of surrounding planets.**
- Earth is in the Sun's Goldilocks zone.
- Rocky exoplanets found in habitable zones of their stars, are more likely targets for detecting liquid water on their surfaces.

20TH DECEMBER

1. Katabatic and Anabatic winds: Recent research

reveals that Katabatic winds play a role in cooling Himalayas.

- Katabatic winds are **cool, denser air moving downhill due to gravity.**
- They **affect local climates**, even reducing humidity in the air and blowing away snow.
- Contrary to this anabatic **wind is warm wind that blows up a mountain slope due to a warmer temperature on mountain slope compared to the temperature in air column.**
- It can influence cloud formation and precipitation patterns.

2. Gut bacteria: Recent research indicates that a variety of gut bacteria safeguards the human gut from diseases, but this defense diminishes if a single bacterial species is present in gut.

- **Diverse gut bacteria hinder pathogen growth by consuming nutrients that the pathogen needs.**
- Gut bacteria are an **important component of the microbiota ecosystem** in the human gut.
- They are **known to supply essential nutrients, synthesizing vitamin K, aiding in cellulose digestion**, promoting angiogenesis and enteric nerve function.

3. Lathyrism: Lathyrism is an **incurable neurological disorder**, which clinically manifests as paralysis of lower limbs.

- It is **caused by eating large quantities of legume Lathyrus Sativus (khesari dal or grass pea)** which contains neurotoxins ODAP.
- This legume resembles toor dal, grows easily in fallow fields, and resistant to pests and biotic stress.
- **In 1961, India banned its sale under the Prevention of Food Adulteration Act, 1954.**
- However, cultivation is allowed as it is used for animal feed.

4. Gene Drive Technology: Abdoulaye Diabate from Burkina Faso, recipient of the 2023 Falling Walls Prize for Science and Innovation Management, is developing Gene Drive Technology to eradicate malaria.

- In this technology, **genetically modified male mosquitoes, who cannot produce female offsprings after mating, are released in the environment.**
- This technology **aims to deplete the female mosquito population**, effectively reducing malaria transmission.
- Malaria is generally transmitted through the bite of female Anopheles mosquitoes, as male mosquitoes do not bite.

21ST DECEMBER

1. Alternative Investment Funds (AIFs): RBI tightens norms to **prevent evergreening of loans via investments in AIFs.**

- AIFs means any fund established or incorporated in India which is a privately pooled investment vehicle which collects funds from sophisticated investors, whether Indian or foreign, for investing.
- **Three Categories of AIFs**
 - **Category I:** Investment in start-up, social ventures, small & medium enterprises (SME) etc. E.g. Venture capital funds, SME Funds etc.
 - **Category II:** Investment in equity and debt securities. E.g. Real estate funds, Private equity funds etc.
 - **Category III:** Investment aimed at short-term returns achieved by employing complex trading strategies. E.g. Hedge funds, Private Investment in Public Equity (PIPE) Fund etc.

2. Tropospheric Emissions Monitoring of Pollution (TEMPO) Satellite: NASA's TEMPO satellite monitors air pollution hourly over North America.

- TEMPO is **NASA's first Earth-observation satellite in geostationary orbit.**
- It allows scientists to monitor air pollutants and their emission sources from space more comprehensively than ever before.
- Among the pollutants tracked by TEMPO will be **nitrogen dioxide, formaldehyde, sulfur dioxide and ozone.**
- TEMPO's monitoring range extends from **Canada's oil sands to Yucatán Peninsula and across Atlantic to Pacific Ocean.**
- Data gathered by TEMPO will be shared with National Oceanic and Atmospheric Administration and Environmental Protection Agency to enhance air quality forecasting.

3. Monkeypox (Mpox): WHO warned an epidemic of Mpox in Democratic Republic of Congo could spread internationally.

- Mpox is a **viral zoonotic illness caused by monkeypox virus, a species of genus Orthopoxvirus.**
- It **was first discovered in 1958** when two outbreaks of a poxlike disease occurred in colonies of monkeys kept for research.
- Primarily occurs in **tropical rainforest areas of Central and West Africa.**
- Transmitted to humans through physical contact with someone who is infectious, with contaminated materials, or with infected animals.
- **Common symptoms:** Skin rash or mucosal lesions, fever, headache, muscle aches, and swollen lymph nodes.

4. JN.1 Variant: First case of a person infected with JN.1 variant of Sars-CoV-2 was reported in India.

- Sars-CoV-2 virus was responsible for Covid-19 pandemic.
- **About JN.1 Variant:** It is a sub-variant of Sublineage BA.2.86 (also known as Pirola), is an off-shoot of the widely circulating Omicron variant.
- Variant is a genome (genetic code) that may contain one or more mutations. **World Health Organization (WHO) has classified it as a variant of interest.**
- These are strains that are worrying enough to trigger stepped up investigations of the variant by countries, like laboratory studies

22ND DECEMBER

1. Indira Gandhi Peace Prize, 2023: Indira Gandhi Prize for Peace, Disarmament and Development for 2023 has been jointly awarded to **Daniel Barenboim and Ali Abu Awwad .**

- They **have brought together the youth and peoples of Israel and the Arab World for a non-violent resolution of the Israel-Palestine conflict.**
- It has been conferred every year **since 1986 by Indira Gandhi Memorial Trust.**
- It consists of a monetary award of Rs 25 lakh along with a citation

2. Right to Persons with Disabilities (RPwD) Act of 2016: Social Justice Minister said that persons with blood disorders including **Thalassemia are not eligible for the benefit of reservation under the RPwD Act.**

- It **identifies 21 disabilities e.g. Blindness, low vision, etc.**
- It provides for reservation of **not less than 4% in government jobs for persons with disabilities, as well as a 5% reservation in higher education institutions.**
- Stress has been given to ensure accessibility in public buildings (both Government and private) in a prescribed time frame.

3. Provisional Collection of Taxes Bill 2023: Lok Sabha passed the Bill to give immediate effect to the changes in customs and excise duties announced in the Budget.

- Replaced the **erstwhile Provisional Collection of Taxes Act, 1931.**
- **Provisions under the Bill**
 - **Interim collection of taxes** - obtain the authority from Parliament to provisionally levy and collect the newly imposed or increased duties of customs and excise for 75 days.
 - **Refund of taxes and duties in certain cases** - Refunds will be made on the difference between the

declaration and the enacted provision

4. Fly Ash: Recent National Green Tribunal cases show that **thermal power plants are still not disposing off fly ash properly**. Thermal Power plants have been mandated to ensure 100% utilisation of fly ash under notification issued in 2021.

- A very fine powdery material left after burning coal.
- **Composition**
 - Made up of silicon dioxide, calcium oxide, and it also contains toxic elements.
- **Usages**
 - In manufacturing of Portland cement, bricks etc.
 - Manufacturing of Absorbents (for Removal of Air and Water Pollutants).

23RD DECEMBER

1. Parliament passes 3 Bills: Both the Houses of the Parliament have passed following 3 bills:

- The Post Office Bill, 2023 to **ensure the effective functioning of the Postal Department**
- The **Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Bill, 2023** provides for the appointment, salary, and removal of the CEC and ECs
- The Telecommunications Bill, 2023 to regulate activities related to telecommunication

2. ECI guidelines on Persons with Disabilities (PwDs): The guidelines seek to nudge political parties to move towards respectful discourse for PwDs and ensure their equal participation.

- **Key highlights**
 - Any usage of derogatory references to PwDs may attract provisions of Section 92 of Rights of Persons with Disabilities Act 2016.
 - The Section discusses punishment for atrocities against PwD.
 - **All political parties shall use rights-based terminologies as mentioned in CRPD (Convention on Rights of Persons with Disabilities).**
 - CPRD (India is signatory) aims to promote, ensure full and equal enjoyment of all human rights and fundamental freedoms by all PwDs

3. UNESCO's 2023 Prix Versailles: Kempegowda International Airport Bengaluru (Karnataka) was honored at **UNESCO's 2023 Prix Versailles, and named among the 'World's most beautiful airports'**.

- Granted annually at UNESCO since 2015, **the Prix Versailles consists of architecture awards that showcase the finest contemporary achievements**

worldwide.

- The Official list align with the principles of intelligent sustainability and takes into consideration projects' ecological, social and cultural impacts into consideration.
- It **highlights the primary role of the Laureates in beautifying and improving the living environment.**

4. Chilla-i-Kalan began in Kashmir: Chilla-i-Kalan is a Persian term that means 'major cold' and it refers to the 40-days of harsh winter in Kashmir.

- It begins from **December 21 and ends on January 31.**
- Snow during the period replenishes the streams, rivers, and lakes of Kashmir.
- It is followed by a 20-day-long 'Chillai Khurd or small cold (occurs between January 31 and February 19)' and a 10-day-long 'Chillai Baha or baby cold (February 20 to March 2)'.

25 DECEMBER

1. Asian Development Bank (ADB) Loan to Tripura: The Government of India signed an agreement with the ADB to avail USD 100 million loan to improve urban services and tourism facilities in Tripura.

- **Genesis:** Established in 1966.
- **Members:** 68 members (49 are from within Asia and Pacific). India is a member
- **Shareholders:** Developing and developing countries from Asia as well as from outside Asia.
 - USA and Japan are the largest shareholders followed by China and India.
- **Function:** It assists its members and partners by providing loans, technical assistance, grants, and equity investments to promote social and economic development.

2. Namdapha flying squirrel (Biswamoyopterus biswasi): Missing for 42 years, flying squirrel resurfaces in Arunachal Pradesh.

- It's a **nocturnal, endemic to northeastern India mammal.**
- **Status:** Critically endangered.
- **Range:** Only known with certainty from a single specimen collected in Namdapha National Park, Arunachal Pradesh.
- **Habitat:** Occurs in dry deciduous montane forests occupying moist forest tracts along streams.
- **Threats:** poaching, habitat loss.
- Protected under **schedule II of the Wildlife Protection Act, 1972.**
- Namdapha Tiger Reserve has evergreen Forests, Moist deciduous forests, sub-tropical forests, Temperate Forests and Alpine biomes.

3. Indian Ocean Naval Symposium (IONS) – 2023: 8th edition of IONS Conclave of Chiefs was conducted by Royal Thai Navy at Bangkok, Thailand. Republic of Korea Navy was welcomed as latest 'Observer', raising the collective strength of IONS to 34 (25 Members & 09 Observers).

- Was conceived by **Indian Navy in 2008**.
- It is a voluntary initiative that seeks to increase maritime cooperation among navies of the littoral states of the Indian Ocean Region.
- Last year, **IONS conducted its maiden edition of maritime exercise, IMEX-22**.

4. Salwa Judum: NHRC has directed **Ministry of Home Affairs and 6 States to furnish information on victims of Salwa Judum**.

- The term Salwa Judum translates to "**Purification Hunt**" in local Gondi language.
- It was a militia that had been deployed as part of anti-Maoist operations in Chhattisgarh.
- It was **operational between 2005 and 2011**, before it was banned by Supreme Court in **Nandini Sundar vs State of Chhattisgarh case**.
- Critics accused **Salwa Judum of human rights abuses, including forced displacement, arbitrary arrests etc.**

27TH DECEMBER

1. World's oldest-known Fort Discovered: An international team of archaeologists has uncovered what is believed to be the **world's oldest-known fort in a remote region of Siberia**.

- The fortified settlement, named **Amnya, is located along the Amnya River in western Siberia**.
- Radiocarbon dating of samples collected at the site places the **fort's construction around 8,000 years ago**.
- The ground breaking discovery challenges conventional beliefs about early human societies.
- It is suggesting that **complex defence structures existed among hunter-gatherers much earlier than previously thought**.

2. Pong Dam Wildlife Sanctuary (PDWS): Ministry of Environment, Forest and Climate Change issued draft notification **declaring one-kilometre area around PDWS as an Eco-Sensitive Zone, where commercial activities will not be allowed**.

- Located in **Kangra district, Himachal Pradesh**.
- Pong Dam Lake (Maharana Pratap Sagar) is a **manmade reservoir created in 1975** with construction of Pong Dam on Beas River. It is **also known as Pong reservoir or Pong Dam**.
- In **1983, reservoir was declared as Wildlife Sanctuary**.

- Pong Dam Lake was **designated a Ramsar site in 2002**.
- There is a **Vulture café in Pong** wherein cattle carcass is dumped for Vultures.
- **Fauna:** Leopard, Sambher, Wild Boar, Porcupine etc.

3. Card-on-File Tokenisation (CoFT): RBI has enabled CoFT directly through card issuing banks.

- This will provide **cardholders with additional choice to tokenise their cards for multiple merchant sites through a single process**.
- CoFT Tokenisation refers to **replacement of actual credit and debit card details with an alternate code called the token**.
- This token is unique for a specific combination of card, token requestor, and device.
- Card details when stored with a merchant are known as Card-on-File.
- To avoid any breach or leak of data, **RBI introduced tokenisation**.

4. Dengue: World Health Organization (WHO) has reported more than five million dengue infections and 5,000 deaths from Dengue in 2023.

- India, along with **Indonesia, Myanmar, Sri Lanka and Thailand rank among the world's 30 most highly endemic countries**.
- Dengue virus is transmitted to humans through bite of **infected mosquitoes (Aedes Aegypti)**.
- Found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas.
- **Factors for dengue spread:** Changing distribution of mosquitoes owing to 2023 El Nino phenomena and climate change leading to increasing temperatures and high rainfall.
- There is **no specific treatment for dengue**

28TH DECEMBER

1. Anaemia: Indian Council of Medical Research (ICMR) initiates steps to provide easy to use **non-invasive testing to tackle anaemia in India**

- It is a condition in which the **number of red blood cells or the Hemoglobin concentration within them is lower than normal**.
- Hemoglobin is a protein found in red cells that carries oxygen from the lungs to all other organs.
- It **mainly affects women and children**.
- As per the India's National Family Health Survey 5 (2019-21), **59.1% of adolescent girls and 57% of women (15-49 years) are suffering from it**.
- **Key Initiatives:** Anaemia Mukta Bharat (AMB), 2018

2. Electronic Soil (e-Soil): Researchers develop 'electronic soil', a **low-power bioelectronic growth substrate, tailored for hydroponic cultivation**.

- e-Soil can electrically stimulate the root system and growth environment of plants.
- Hydroponics is **soil-free plant cultivation, utilising water, nutrients, and a substrate for root attachment.**
- This method offers numerous benefits.
- Precise nutrient control ensures **faster growth, higher yields, and superior quality produce.**
- Enables vertical cultivation in large towers to maximise space efficiency.
- **Uses dramatically less water compared with conventionally grown plants.**
- Such plants have significantly fewer pests

3. Formaldehyde (CH₂O): Researchers developed a new non-invasive sensor that can detect formalin adulteration in fishes. Formalin is a solution of 37% formaldehyde.

- It is a **colorless, strong-smelling, and flammable chemical.**
- **Usage:** Manufacture of resin, production of plastic, cosmetics industry, household products, disinfectants, preservatives, etc.
- **World Health Organisation has classified it as carcinogenic to humans.**
- A carcinogen is a substance, organism, or agent capable of causing cancer.

4. OSIRIS-APEX: OSIRIS REx (Origins, Spectral Interpretation, Resource Identification and Security-Regolith Explorer) is embarking on a new mission as OSIRIS-APEX (Apothis Explorer)

- Recently, **OSIRIS REx delivered a sample from asteroid Bennu.**
- **OSIRIS-APEX will study Apophis** when it will be closest to Planet Earth i.e. 20000 miles.
- Apophis is an S-type asteroid made of silicate materials and nickel-iron.
- **The mission aims to observe the physical changes in asteroid Apophis induced by Earth's gravitational pull.**
- **Space Agency: NASA**

29TH DECEMBER

1. SAMARTH Programs: The government has launched six SAMARTH-curated training programs on **iGOT Karmayogi Platform for State Government officials.**

- It includes **SAMARTH Blocks, SAMARTH Zila, SAMARTH Rajya, SAMARTH Rajya Sachiva, SAMARTH Policy and SAMARTH Procurement**
- **Aim:** to elevate the skills and competencies of government officials, ensuring they are well-equipped to meet the evolving needs of governance.
- **iGOT Karmayogi is a comprehensive online**

learning platform for the capacity building of government officials.

- The portal combines six functional hubs for online learning, competency management, career management, discussions, events, and networking

2. Migration and Mobility Agreement: Cabinet approved the Migration and Mobility Agreement between India and Italy.

- **Agreement would:**
 - Enhance **people-to-people contacts, foster mobility of students, skilled workers, business people, and young professionals and**
 - Strengthen cooperation on irregular migration between the two sides.
- **Key provisions include:**
 - Indian students, after completing academic/vocational training in Italy may be granted temporary residence for up to 12 months.
 - For workers, the Italian side has reserved a quota for non-seasonal and seasonal Indian workers for 2023, 2024, and 2025 under the current Flows Decree.

3. Smart India Hackathon (SIH)-2023: The 6th edition of the Smart India Hackathon was recently held.

- It is an initiative of the Government of India to help various government departments, private organizations get solutions for some of their pressing problems through students.
- It is **jointly organized by the Ministry of Education's Innovation Cell, All India Council for Technical Education (AICTE), Persistent Systems, and i4c.**
- **New in SIH 2023:** Open its door for school-going students of class 8th and above

4. Antarctic Circumpolar Current (ACC): Scientists have discovered an ancient underwater mountain range hidden within the world's strongest ocean current, the ACC.

- It was **observed in the area of the Southern Ocean.**
- Southern Ocean comprises southernmost waters below 60 degrees south latitude, it encircles the entire Antarctic continent.
- It is **only current that flows completely around the globe.**
- It encircles the Antarctic continent and flows eastward through the southern portions of the Atlantic, Indian, and Pacific Oceans.

30 DECEMBER

1. Neora Valley National Park: Recently, **Royal Bengal Tiger has been seen in the Neora Valley National Park (West Bengal).**

- This has confirmed the presence of the big cats at an

altitude of 10,509 feet above sea level.

- Lies in the catchment of the Neora River and is part of a **global biodiversity hotspot located in the Eastern Himalayas**.
- **Declared as an Important Bird Area.**
- Links the **Pangolakha Wildlife Sanctuary (Sikkim) and the Toorsa Strict Reserve (Bhutan)**.
- **Forest Type:** Subtropical Mixed Broadleaf Forest, Lower Temperate Evergreen Forest, Upper Temperate Mixed Broadleaf Forest and Rhododendron Forest.
- **Key Fauna:** Red Panda, Himalayan Tahr, Himalayan Black Bear, etc.

2. Near Infrared Light: Researchers have found that Near-infrared light ruptures cancerous cells with high effectiveness.

- Near-infrared has shown **high effectiveness than visible rays because of its higher penetrative power**.
- However, researcher raised concern that its high penetrative power may cause damage to vital tissues.
- **About Near Infrared Rays:** A portion of radiation that is just beyond the visible Electromagnetic (EM) Spectrum is referred to as near-infrared.
- It is **part of the Infrared Light (IR)**.
- **Other Applications:** Used in by satellites to observe vegetation and soil composition.
- EM spectrum also consists of **Radio waves, Microwaves, Visible, Ultraviolet light, X-rays and**

gamma-rays (arranged in low to high energy or frequency).

3. Kilonova Explosion: A team of researchers have developed a method to model the kilonova explosion.

- A kilonova is a **bright blast of electromagnetic radiation that happens when two neutron stars or a neutron star and a stellar-mass black hole collide and merge**.
- A neutron star is formed when a star having a mass more than 1.44 times that of the Sun (as per Chandrasekhar limit) blows off its gaseous envelope in a supernova explosion
- They are among the **densest objects in the cosmos**.

4. TDS on e-commerce: Central Board of Direct Taxes clarified that provisions for tax deducted at source (TDS) by e-commerce operators will be applicable to multiple e-commerce operator model framework, such as ONDC.

- Income-tax Act, 1961 mandates **e-commerce operators to deduct 1% TDS from total sale amount of goods or services facilitated through their digital platform**.
- ONDC is aimed at promoting open networks for all aspects of exchange of goods and services over digital networks.
- It was **incorporated under Section 8 of the Companies Act in 2021**.
- **Quality Council of India and Protean eGov Technologies Limited** are its founding members



PRELIMS BOOSTER-PRESS INFORMATION BUREAU (PIB)

1ST DECEMBER

1. World AIDS Day: It is **observed every year on December 1 to spread awareness about HIV/AIDS**. The day is an opportunity to **end stigmas associated with this disease**, and this day also honours people who lost their precious lives and engage in lives that support HIV/AIDS research and advanced treatment. It was **first observed in 1988**, when the World Health Organisation (WHO) recognised the day. **The theme of World AIDS Day 2023 is– “Let Communities Lead”**

2. HIV/AIDS: Acquired immunodeficiency syndrome (AIDS) is a **chronic, potentially life-threatening condition caused by the human immunodeficiency virus (HIV)**. HIV attacks the body's immune system, making a person more vulnerable to other infections and diseases. If HIV is not treated, it can lead to AIDS. It is a **sexually transmitted infection (STI)**. It can also be spread by contact with infected blood, from illicit injection drug use, or by sharing needles. It can also be spread from mother to child during pregnancy, childbirth, or breastfeeding.

Treatment: There is currently no effective cure. Once people get HIV, they have it for life. However, with proper medical care, HIV can be controlled. People with HIV who get effective HIV treatment (called antiretroviral therapy, or ART) can live long, healthy lives and protect their partners.

3. INS Kadmat: It is an **indigenous stealth anti-submarine warfare corvette**. It is the **second of four anti-submarine warfare corvettes built for the Indian Navy by the Garden Reach Shipbuilders and Engineers of Kolkata under Project 28**. It was commissioned into the Indian Navy in January 2016. **The ship was inducted into the Eastern Naval Command of the Indian Navy**. It has been named after the **Kadmat Island of India's Lakshadweep Islands**.

The **primary role of the INS Kadmat is in anti-submarine warfare**—to protect ships in convoys and ports from enemy submarine attacks. The ship is fitted with state-of-the-art weapons, sensors, and machinery and is also designed to embark on the Sea King anti-submarine helicopter.

The ship also has on-board early warning, navigation, and fire control radars, besides underwater sensors and integrated communication and electronic warfare systems. **It produces low levels of radiated underwater**

noise, which reduces its chances of detection. It is equipped with anti-aircraft guns, torpedoes, and rocket launchers.

4. Exercise Milan: It is a **biennial multilateral naval exercise that began in 1995**. It has since significantly expanded in scope and scale to become the largest exercise held by India. It was **started with the participation of only four countries, viz., Indonesia, Singapore, Sri Lanka and Thailand, in the 1995 edition**, the exercise has since transitioned leaps and bounds in terms of the number of participants and complexity of exercises. **Originally conceived in consonance with India's 'Look East Policy, MILAN expanded in ensuing years with the Government of India's 'Act East Policy' and Security And Growth for All in the Region (SAGAR) initiative** to include participation from other Friendly Foreign Countries (FFCs). The mid-planning conference of Milan-24 was held in October this year. The last edition of Milan, which is held off the coast of Visakhapatnam, saw participation from over 40 countries.

2ND DECEMBER

1. Codex Alimentarius Commission: It is an international food safety and quality standard-setting body. It was **created by the World Health Organisation and Food and Agriculture Organisation of the United Nations in May 1963**.

The objective is to **Protect consumer's health and ensuring fair practices in food trade**. **It consists of 189 member countries**. Membership of the Commission is open to all Member Nations and Associate Members of FAO and WHO which are interested in international food standards. The Commission meets in regular sessions once a year, alternating between Geneva and Rome. **The programme of work of the Commission is funded through the regular budgets of WHO and FAO**, with all work subject to the approval of the two governing bodies of the parent organisations. **The Commission works in the six official languages of the UN**. **Currently, it has standards for sorghum and pearl millet**.

2. Iyothee Thass Pandithar: Recently, the Tamil Nadu government installed a **statue of Dalit rights and anti-caste activist Iyothee Thass Pandithar at Gandhi Mandapam in Chennai**. He was born on 20 May 1845 in Madras presidency. He was a prominent anti-caste activist and a practitioner of Siddha medicine.

Association with tribal people: In the 1870s, Iyothee Thass organised the Todas and other tribes of the Nilgiri Hills into a formidable force for the freedom movement. In 1876, Thass established the Advaidananda Sabha and launched a magazine called Dravida Pandian in collaboration with Rev. John Rathina. He established the "Dravida Mahajana Sabha" in 1891 along with Rettamalai Srinivasan. He established the Sakya Buddhist Society in Madras, with branches all over South India.

The **Sakya Buddhist Society, also known as the Indian Buddhist Association**, was established in 1898. To manage and coordinate the functioning of society, he began a weekly magazine, Tamizhan, in 1907.

3. Project Kuiper: It is Amazon's project to build a network of 3,236 satellites in low Earth orbit to provide high-speed internet access anywhere in the world. Its mission is to bring fast, affordable broadband to unserved and underserved communities around the world.

Project Kuiper has three main parts:

- **Ground infrastructure:** It includes gateway antennas that securely send and receive customer data to and from satellites, along with telemetry, tracking, and control (TT&C) antennas that keep the satellites properly operating. Global networking connects those gateway antennas to the internet, public cloud, or private networks.
- **Satellites:** They operate in low Earth orbit (LEO) and relay data traffic to and from gateway antennas and customers.
- **Customer terminals:** These are the technologies that Project Kuiper customers use to receive broadband service. The terminals combine antennas and processors into a single, compact system to deliver connectivity.

3RD DECEMBER

1. Mount Marapi: Recently, Indonesia's Mount Marapi in West Sumatra province erupted, spewing white-and-grey ash plumes for more than 3,000 metres into the air. Not to be mistaken with Mount Merapi in Java, this **Mount Marapi is located in West Sumatra. Its name means Mountain of Fire.** With over 60 eruptions to its credit since the late 18th century, Marapi claims the title of the most active volcano in Sumatra.

2. Allied Climate Partners: At COP28, Allied Climate Partners joined the International Finance Corporation in a climate financing venture to try to generate \$11 billion in investments in developing countries. **It is a philanthropic investment organisation.** With a mission to increase the number of bankable, climate-related projects and businesses in emerging markets and

developing economies to create significant environmental, economic, and social impact. **Its initial focus regions are Southeast Asia, the Caribbean and Central America, Africa, and India.**

3. International Finance Corporation: It was founded in 1956 with Washington, DC as its headquarters. It is a member of the World Bank Group. Its **Mandate is to Advance economic development and improve the lives of people by encouraging the growth of the private sector in developing countries.** It helps countries develop their private sectors in a variety of ways

Functions: Investing in companies through loans, equity investments, debt securities and guarantees.

- **Mobilising capital** from other lenders and investors through loan participations, parallel loans and other means.
- Advising businesses and governments to encourage private investment and improve the investment climate.
- **The IFC is owned and governed by its member countries.** It is a corporation whose shareholders are member governments that provide paid-in capital and have the right to vote on its matters.

4. White Lung Syndrome: It originates from distinctive white patches on chest X-rays in affected children. **The term includes various respiratory illnesses like acute respiratory distress syndrome, pulmonary alveolar microlithiasis, and silica-related conditions.**

Causes: It is believed to be caused by a **combination of bacterial, viral, and environmental factors.** The patients have symptoms including cough, fever, runny nose, phlegm pileup in sinuses, difficulty breathing and fatigue. **The treatment is mainly focused on addressing the symptoms of pneumonia and ensuring the respiratory health of the patients.** Medicines are given to alleviate symptoms like cough and fever. Overall monitoring must be done and oxygen therapy provided if necessary.

5. Purchasing Managers' Index: It is an indicator of business activity – both in the manufacturing and services sectors. It is a **survey-based measure** that asks the respondents about changes in their perception of some key business variables from the month before.

It is calculated separately for the manufacturing and services sectors and then a composite index is constructed. The index helps in determining whether the market conditions, as seen by purchasing managers, is expanding, contracting or staying the same. **There are two types of PMI — Manufacturing PMI and Services PMI.**

4TH DECEMBER

1. National Crime Records Bureau (NCRB): It was established in 1986 to act as a repository of

information on crime and criminals. It comes under the Ministry of Home Affairs (MHA). It was set up **based on the recommendations of the Tandon Committee, the National Police Commission (1977-1981) and the Task Force of the Home Ministry.** It is responsible for collecting and analysing crime data as well as serving as a repository of such information to aid investigators in tracing crimes and criminals. **Headquarters: New Delhi.** In 2009, the NCRB was entrusted with the responsibility of monitoring, coordination, and implementing the Crime and Criminal Tracking Network and System (CCTNS) project. **In 2017, the NCRB launched the National Digital Police Portal,** which allows police officers to look for a criminal or suspect on the CCTNS database and gives citizens with services such as online complaint filing, etc. **The Bureau has also been entrusted to maintain the National Database of Sexual Offenders (NDSO) and share it with the States/UTs on a regular basis.** NCRB has also been designated as the Central Nodal Agency to manage the technical and operational functions of the 'Online Cyber-Crime Reporting Portal' through which any citizen can lodge a complaint or upload a video clip as evidence of crime related to child pornography, rape/gang rape. **The NCRB has also launched CyTrain, a portal for online training of different stakeholders in cybercrime investigations and prosecution.** The Central Finger Print Bureau under the NCRB is a national repository of all fingerprints in the country. **NCRB also compiles and publishes National Crime Statistics** i.e. Crime in India, Accidental Deaths & Suicides, and also Prison Statistics. NCRB also assists various States in capacity building through its training centres in Delhi and Kolkata.

2. Climate Club: It is led by Germany and Chile, the Club has garnered support from 36 member countries including Kenya, the European Union, Switzerland and others. It **aims to make decarbonisation of industries successful for climate and businesses,** through ambitious policies, alignment of methodologies and standards and improving finance and assistance for emerging and developed economies. **The activities of the club are divided into three key pillars: -**

Pillar 1: Advancing ambitious and transparent climate change mitigation policies.

Pillar 2: Transforming industries

Pillar 3: Boosting international cooperation and partnership

Two co-chairs will be elected for two-year terms for the Club. **Currently, Germany and Chile serve as the co-chairs.** A body of members will determine the scope and approve the work programme, budget and amendments. **Furthermore, a steering group will be formed to support the body of members when the Club reaches 40 members.** A secretariat will be formed to implement the work program. Currently, **Organisation for Economic Co-operation and Development and**

International Energy Agency are the joint interim heads of secretariat.

3. Economic and Social Council (ECOSOC): It is one of the six principal organs of the UN, which was established by the UN Charter (1945). It is **responsible for the direction and coordination of the economic, social, humanitarian, and cultural activities carried out by the UN.** Decisions are taken by a simple majority vote. **The presidency of ECOSOC changes annually. It has 54 members, which are elected for three-year terms by the General Assembly.** Four of the five permanent members of the Security Council have been continuously re-elected. This is because they provide funding for most of ECOSOC's budget, which is the largest of any UN subsidiary body. **ECOSOC is responsible for coordinating the social and economic fields of the organisation, specifically in regards to the 15 specialised agencies, the five regional commissions under its jurisdiction and eight functional commissions. It also serves as a central forum to discuss international social and economic issues** and formulate policy recommendations addressed to the member states and the United States system.

5TH DECEMBER

1. Panchayat Development Index: It is a **multi-domain and multi-sectoral index that is intended to be used to assess the overall holistic development, performance & progress of panchayats.** It takes into account various socio-economic indicators and parameters to gauge the well-being and development status of the local communities within the jurisdiction of a panchayat. **The nine themes taken into account are poverty free and enhanced livelihood in village, healthy village, child friendly village, water sufficient village, clean and green village, village with self-sufficient infrastructure, socially just and socially secured villages, village with good governance, and women friendly village.** This Index ranks panchayats on the basis of scores, and categorises them into four grades. **Those with scores under 40 per cent fall in grade D, 40-60 per cent in grade C, 60-75 per cent in grade B, 75 to 90 per cent in category A, while those scoring above 90 per cent will be categorised as A+.**

2. Lakadong turmeric: Recently, Meghalaya's Lakadong turmeric has been awarded the **Geographical Indication (GI) tag.** It is considered to be one of the world's best varieties of turmeric, with a **curcumin content of around 6.8 to 7.5 per cent.** It is darker in colour and is grown organically without the use of fertilisers. **It is found in Lakadong area of Jaintia Hills, has high curcumin content.** Other GI products from Meghalaya: **Garo Dakmanda (traditional dress), Larnai pottery and Garo Chubitchi (alcoholic beverage) were also awarded the GI tag,**

3. Pompe disease: It is a rare inherited disorder that affects one child per million. **Mutations in the GAA gene cause Pompe disease.** The GAA gene provides instructions for producing an enzyme called acid alpha-glucosidase (also known as acid maltase). **This enzyme is active in lysosomes,** which are structures that serve as recycling centres within cells. **The enzyme normally breaks down glycogen into a simpler sugar called glucose, which is the main energy source for most cells.** Mutations in the GAA gene prevent acid alpha-glucosidase from breaking down glycogen effectively, which allows this sugar to build up to toxic levels in lysosomes. Some common side effects and symptoms include muscle weakness, respiratory issues, heart problems and difficulty swallowing. **This disease can be:**
Infantile-onset: symptoms begin in the first few months after birth.

Late-onset or delayed-onset: symptoms appear later in childhood or in adulthood.

It affects males and females equally. **The treatment includes enzyme replacement therapy (ERT).**

4. Cyber Surakshit Bharat Initiative: The National e-Governance Division (NeGD) recently organised **the 40th Chief Information Security Officers (CISOs) Deep-Dive training programme under the Cyber Surakshit Bharat Initiative.** It is an initiative of the Ministry of Electronics and Information Technology (MeitY), Government of India. **It was conceptualised with the mission to spread awareness about cybercrime and build the capacities of Chief Information Security Officers (CISOs) and frontline IT officials across all government departments. It is an initiative to fortify the cyber security system in India with regard to the Government's vision of a Digital India.** It was launched in cooperation with the National e-Governance Division (NeGD) and various industry partners in India. **It can be entitled as the first public-private enterprise of its kind.** The partners involved in the origination of this scheme include chief IT companies like Intel, Microsoft, etc.

7TH DECEMBER

1. Multiple Sclerosis: It is a **long-lasting (chronic) disease of the central nervous system.** In people with MS, the immune system attacks cells in the myelin, the protective sheath that surrounds nerves in the brain and spinal cord. Damage to the myelin sheath interrupts nerve signals from your brain to other parts of your body. **The damage can lead to symptoms affecting your brain, spinal cord, and eyes.** Eventually, the disease can cause permanent damage or deterioration of the nerve fibres. **MS affects women more than men.** The disorder is most commonly diagnosed between ages 20 to 40, but it can be seen at any age.

There are many possible causes of MS, including: **Autoimmune disorders; Infectious agents, such as viruses; Environmental factors; Genetic factors.** It varies widely between patients and depends on the location and severity of nerve fibre damage in the central nervous system. **In severe cases, a person may experience paralysis, vision loss, and mobility problems.** There's no cure for multiple sclerosis. However, there are treatments to help speed the recovery from attacks, modify the course of the disease, and manage symptoms.

2. Solar Orbiter: It is a **Sun-observing satellite with 10 science instruments, all designed to provide unprecedented insight into how the sun works.** It is conceived to perform a close-up study of our Sun and inner heliosphere—the uncharted innermost regions of our Solar System. **It is a joint mission of the European Space Agency (ESA) and NASA.** It is the most complex scientific laboratory ever to have been sent to the Sun. It will take images of the Sun from closer than any spacecraft before and, for the first time, look at its uncharted polar regions. **The mission, launched on February 10, 2020, released its first images in June of that year.** After multiple gravitational assist manoeuvres at Earth and Venus, it started its full science operations in December 2021. **It follows an elliptical orbit around the sun, with the closest point, the perihelion, at about 25 million miles (40 million kilometres) from the sun, which is closer than the orbit of Mercury.**
Instruments: It carries six remote-sensing instruments to observe the Sun and the solar corona and four in-situ instruments to measure the solar wind, energetic particles, and electromagnetic fields. **The mission is scheduled to last until at least 2027.**

3. Garba Dance: It is a ritualistic and devotional dance performed throughout the State of Gujarat. It is celebrated for nine days during the festival of Navratri. **The festival is dedicated to the worship of the feminine energy or Shakti.** The cultural, performative, and visual expressions of this feminine energy are expressed through the Garba dance. The performative and visual celebration of Garba takes place within homes and temple courtyards, public spaces in villages, urban squares, streets, and large open grounds. **Garba thus becomes an all-encompassing participatory community event. In addition to being a religious ritual, Garba fosters social equality by diluting socio-economic, gender, and rigid sect structures.** It continues to be inclusive and participative by diverse and marginalised communities, strengthening community bonds. **This dance form is the 15th cultural item from India to make it to the UNESCO list.**

8TH DECEMBER

1. Oil and Gas Decarbonization Charter: Recently, Conference of Parties (COP28) **President Dr. Sultan Al Habier and the Kingdom of Saudi Arabia announced**

the official launch of the Oil and Gas Decarbonization Charter (OGDC). It is a dedicated initiative for the oil and gas sector.

It aims to induce substantial impact in addressing climate challenges. Currently, 50 companies, collectively responsible for over 40 percent of global oil production, have committed to the OGDC. National Oil Companies have shown historic participation, constituting over 60 percent of the total signatories, marking a noteworthy shift towards decarbonization within this sector. It is integral to the Global Decarbonization Accelerator (GDA).

2. Global Partnership on Artificial Intelligence: It is a multi-stakeholder initiative which aims to bridge the gap between theory and practice on AI by supporting cutting-edge research and applied activities on AI-related priorities. It was launched in June 2020. Membership in GPAI is open to all countries, including emerging and developing countries.

Member countries: At present it has 28 member countries including the European Union. India is one of the founding members of GPAI. Its secretariat is hosted at the Organisation for Economic Co-operation and Development (OECD), Paris. It has a Council and a Steering Committee. It has two Centres of Expertise: One in Montreal and another in Paris. These Centres of Expertise will facilitate GPAI's four working groups and their research and practical projects, across various sectors and disciplines. The working groups will initially focus on four themes: Responsible AI, Data Governance, the Future of Work, Innovation and Commercialization.

3. DRESS Syndrome: It is a type of drug allergy that can occur as a reaction to a large variety of medications. It is sometimes referred to as DIHS (Drug Induced Hypersensitivity Syndrome). This syndrome causes a diverse array of clinical symptoms, anywhere from 2 to 8 weeks after initiating the offending drug. Patients typically present with a rash, fever, and eosinophilia but can have a variety of symptoms including liver, lung, or kidney involvement. Also have a visceral involvement (hepatitis, pneumonitis, myocarditis, pericarditis, nephritis, and colitis) which is the major cause of morbidity and mortality in this syndrome. The most important step to treat DRESS Syndrome is to stop the medication involved in the reaction, and sometimes, no further treatment is needed. It is largely supportive and symptomatic; corticosteroids are often used and sometimes immunosuppressants like cyclosporine.

4. Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA): It was launched in 2013 as a centrally sponsored programme to improve access, equity, and quality in higher education through the planned development of higher education at the state level. It

aims to work with 300-plus state universities and their affiliated colleges.

Objectives: creating new academic institutions, expanding and upgrading the existing ones, developing institutions that are self-reliant in terms of quality education, professionally managed, and characterised by a greater inclination towards research. It aims at providing strategic funding to eligible state higher educational institutions. The central funding is based on norms and is outcome-dependent. Funds flow from the central ministry through the state governments/union territories before reaching the identified institutions.

9TH DECEMBER

1. Adopt a Heritage 2.0 Program: It is a revamped version of the earlier scheme launched in 2017 and clearly defines the amenities sought for different monuments as per the Ancient Monuments and Archaeological Sites and Remains Act (or AMASR Act), 1958. The programme seeks collaboration with the private/public sector companies / trusts / societies / NGOs etc. through their CSR funding who intend to provide, develop, and maintain 'amenities' at centrally protected monuments and sites.

Adopt a Heritage Scheme: It is an initiative of the Ministry of Tourism, in collaboration with the Ministry of Culture and the Archaeological Survey of India. It was launched in September 2017 on the World Tourism Day. Under it, the government invites entities, including public sector companies, private sector firms, as well as individuals, to develop selected monuments and heritage and tourist sites across India. The project aims to encourage these entities to become 'Monument Mitras' and take up the responsibility of developing and upgrading the basic and advanced tourist amenities at these sites. The corporate sector is expected to use corporate social responsibility (CSR) funds for the upkeep of the site. The Monument Mitras, in turn, will get limited visibility on the site premises and on the Incredible India website.

2. River Cities Alliance: It was launched in 2021. It is a first-of-its-kind Alliance in the world, symbolising the successful partnership of the two Ministries i.e., the Ministry of Jal Shakti and the Ministry of Housing and Urban Affairs. It is to provide the member cities with a platform to discuss and exchange information on aspects that are vital for sustainable management of urban rivers, sharing best practices and supporting innovation. The Alliance is open to all river cities of India. Any river city can join the Alliance at any time. The alliance has been launched initially with 30 cities namely Dehradun, Rishikesh, Haridwar, Srinagar, Varanasi, Kanpur, Prayagraj, Farrukhabad, Mirzapur, Mathura, Bijnor, Ayodhya, Patna, Bhagalpur, Begusarai, Munger, Sahibganj, Rajmahal, Howrah,

Jangipur, Hugli-Chinsurah, Berhampore, Maheshtala, Aurangabad, Chennai, Bhubaneswar, Hyderabad, Pune, Udaipur and Vijayawada. It focuses on three broad themes- **Networking, Capacity Building and Technical Support.** The Secretariat of the Alliance is set up at the National Institute for Urban Affairs (NIUA).

3. Green Voyage2050 Project: The overall goal of the Project is to support effective implementation of the Initial IMO GHG Strategy. It provides support to developing countries in their efforts to reduce Greenhouse Gas emissions from ships. The Initial IMO Strategy sets out a clear vision and levels of ambition, one of which is to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008. It is envisaged that the project will strengthen MARPOL Annex VI compliance, facilitate sharing of operational best practices, catalyse the uptake of energy efficient technologies and explore opportunities for low- and zero-carbon fuels.

Components of the project:

Component 1 – Developing global tools to support implementation of the Initial IMO GHG Strategy

Component 2 – Capacity building, policy and NAP development

Component 3 – Strategic partnership development

Component 4 – Technology cooperation, innovation and pilot demonstrations.

The countries participating in the GreenVoyage2050 Project are: Azerbaijan, Belize, China, Cook Islands, Ecuador, Georgia, India, Kenya, Malaysia, Solomon Islands, South Africa, Sri Lanka. These countries are participating as either a New Pilot Country (NPC) or a Pioneer Pilot Country (PPC). The GreenVoyage2050 Project, currently in its first phase, is funded by the Norwegian Ministry of Climate and Environment for an initial period up to December 2023 (NOK 64.5 million).

11TH DECEMBER

1. PM Vishwakarma Scheme: This is a central sector scheme launched by the **Ministry of Micro, Small, and Medium Enterprises**, which offers services like market linkage support, skill training, and incentives for digital transactions to artisans and craftspeople engaged in specified trades. **Time period:** Five years (FY 2023-24 to FY 2027-28). **The aim is to strengthen and nurture the Guru-Shishya parampara**, or family-based practice of traditional skills by artisans and craftspeople working with their hands and tools. It is available for rural and urban artisans and craftsmen across India. It covers 18 traditional crafts such as Boat Maker; Armourer; Blacksmith; Hammer and Tool Kit Maker; etc. Five lakh families will be covered in the

first year and 30 lakh families over five years. **Under this scheme, the artisans and craftspeople will be provided recognition through a PM Vishwakarma certificate and ID card.** They will receive collateral-free credit support of up to ₹1 lakh (first tranche) and ₹2 lakh (second tranche) with a concessional interest rate of 5%. The scheme will further provide craftsmen with methods of skill upgradation involving basic and advanced training, a toolkit incentive of ₹15,000 and incentives for digital transactions, and marketing support. **Under the scheme, there will be two types of skilling programmes -- Basic and Advanced and a stipend of Rs 500 per day will also be provided to beneficiaries while undergoing skills training.**

2. Climate Change Performance Index: In a significant stride towards sustainable practices, **India has ascended to the 7th position in this year's Climate Change Performance Index (CCPI).** It is an instrument to enable transparency in national and international climate politics. It is published by Germanwatch, the New Climate Institute and the Climate Action Network annually. It was first time published in 2005. The CCPI uses a standardized framework to compare the climate performance of 63 countries and the EU, which together account for over 90% of global greenhouse gas emissions. **The climate protection performance is assessed in four categories: GHG Emissions, Renewable Energy, Energy Use and Climate Policy.**

Key highlights:

Denmark retained the top spot with a score of 75.59 per cent. Estonia and the Philippines occupied the second and third ranks respectively, with 72.07 and 70.70. Saudi Arabia was at the bottom — 67th — in the performance list, while the host country United Arab Emirates occupied the 65th position. **India receives a high ranking in the GHG Emissions and Energy Use categories, but a medium in Climate Policy and Renewable Energy, as in the previous year.**

3. YUVAi Initiative: It is a collaborative initiative of **National e-Governance Division (NeGD), Ministry of Electronics & Information Technology (MeitY), Government of India and Intel India.** It is aimed to **foster a deeper understanding of AI, to enable school students from class 8 to 12** across the nation with AI skills and empower them to become human-centric designers and users of AI. Progressing in three phases, the YUVAi programme is being implemented in multiple cohorts to ensure that maximum students stand a chance to become future-ready. In the first Cohort, more than 8,500 students registered, post which, they attended online orientation sessions to learn fundamental concepts of AI. Teachers also enrolled into the program and underwent orientation sessions. Students then submitted innovative AI-

based ideas under one of the eight core themes of the programme. In phase 2, Top 200 AI-based ideas were shortlisted. Shortlisted students attended online deep dive AI training and mentorship. In Phase 3, top 50 students were shortlisted.

12TH DECEMBER

1. Exercise VINBAX-2023: It was instituted in 2018 and the first edition was conducted at Jabalpur, Madhya Pradesh. It is an annual training event conducted alternatively in India and Vietnam. Last edition was conducted at Chandimandir Military Station in August 2022.

This year's Aim of the exercise is to foster collaborative partnership, promote interoperability and share best practices. The exercise will be conducted as a Command Post Exercise cum Field Training Exercise with focus on deployment and employment of an Engineer Company and a Medical Team.

2. Exchange-Traded Funds (ETFs): An ETF is a collection of marketable securities that tracks an index, a commodity, bonds, or a basket of assets. In simple terms, ETFs are funds that track indexes such as CNX Nifty, or BSE Sensex, etc. An ETF can be structured to track anything from the price of an individual commodity to a large and diverse collection of securities. ETFs can even be structured to track specific investment strategies. ETF funds are somewhat similar to mutual funds in terms of their structure, regulation, and management. Additionally, just like mutual funds, they are a pooled investment vehicle that offers diversified investment into various asset classes like stocks, commodities, bonds, currencies, options, or a blend of these. Unlike mutual funds, ETFs can be purchased or sold on a stock exchange in the same way that regular stocks can. The traded price of an ETF changes throughout the day like any other stock, as it is bought and sold on the stock exchange. The trading value of an ETF is based on the net asset value of the underlying stocks that it represents. ETFs have higher daily liquidity and lower fees than mutual fund schemes, making them an attractive alternative for individual investors.

3. Progress of Ongoing COP28 Climate Meeting:

- **Anticipation of Fossil Fuels' Entry at COP28:** There is a strong indication that fossil fuels, a longstanding omission in climate negotiations, are likely to be introduced at COP28. Sultan Al Jaber has extended an invitation to countries to submit their proposals on the phase-out of fossil fuels.
- **Potential Mention of Fossil Fuel Phase-Down:** COP28's final decisions might include a mention of the need to phase down fossil fuels, marking a potentially radical departure as it has remained unmentioned for three decades.

- **No Agreement on Global Stocktake Report:** This report will decide the way forward for climate change, especially on issues of climate equity and phasing out of fossil fuels.

- **Positive Developments on Loss and Damage Fund:** There has been some positive movement on the loss and damage fund which has been operationalised.

4. Article 356: Article 356 of the Constitution of India is based on Section 93 of the Government of India Act, 1935. According to Article 356, President's Rule can be imposed on any state of India on the grounds of the failure of the constitutional machinery. This is of two types: If the President receives a report from the state's Governor or is otherwise convinced or satisfied that the state's situation is such that the state government cannot carry on the governance according to the provisions of the Constitution. **Article 365:** As per this Article, President's Rule can be imposed if any state fails to comply with all directions given by the Union on matters it is empowered to.

13TH DECEMBER

1. Karrar Combat Drones: It is an Unmanned Combat Air Vehicle (UCAV) developed by Iran. It is the first long-endurance, combat-capable Iranian drone. It will be strategically deployed along border areas, providing air defence units with the capability to intercept and neutralize hostile aerial threats at significantly reduced costs compared to traditional manned fighter sorties. The Karrar drone, which was first introduced in 2010, has an operational range of up to 1,000 kilometres. It has a maximum speed granted by its turbojet installation of 560 miles per hour. It reportedly boasts a service ceiling altitude of 47,000 feet. Lacking any retractable or fixed undercarriage, the Karrar is launched via rocket-assist (with a catapult launching rail) and is recovered by way of a parachute-retarded freefall. It has been equipped with the Majid thermal missile with a range of 8 kilometres. The Iranian-made Majid air defence missile features advanced thermal and optical seekers, enhancing its tracking and interception capabilities.

2. Election Commission of India: Election Commission is a permanent and independent body. By Article 324 of the Constitution of India, it is vested with the power of conducting elections to – Parliament, State Legislatures, Office of President and Vice-President of India. The Constitution does not lay down a specific legislative process for the appointment of the Chief Election Commissioner and Election Commissioners. **Article 324(2) says appointment of CEC and other ECs shall be subject to provisions of any law made by the Parliament.** However, no such law has been framed so far. **The President makes the appointment on the advice of the Union Council of Ministers headed by**

the Prime Minister. They have tenure of six years, or up to the age of 65 years, whichever is earlier. They enjoy the same status and receive salary and perks as available to Judges of the Supreme Court of India. The CEC can be removed from office except in same manner and on the same grounds as a judge of the Supreme Court. The Constitution has not debarred the retiring Election Commissioners from any further appointment by the Government

3. Advocates (Amendment) Bill, 2023: The Advocates (Amendment) Bill, 2023, was passed in the Rajya Sabha in August, 2023. Recently, during winter session, the bill was passed from LS. **Aimed at weeding out touts from the legal system, the Bill: repeals the Legal Practitioners Act, 1879, amends the Advocates Act, 1961.** This was done in order to reduce the number of superfluous enactments in the statute book and repeal all obsolete laws. This is in line with the government's policy of repealing all obsolete laws or pre-independence Acts that have lost their utility.

Key Features of the bill:

- **Touts:** The Bill provides that every High Court, district judge, sessions judge, district magistrate, and revenue officer may frame and publish lists of touts. The Court or judge may exclude from the premises of the Court any person whose name is included in the list of touts.
- **Preparation of lists:** The authorities empowered to frame and publish the list of touts may order subordinate courts to hold an inquiry into the conduct of persons alleged or suspected to be touts. Once such a person is proven to be a tout, his name may be included by the authority in the list of touts. No person will be included in such lists without getting an opportunity of showing cause against his inclusion.
- **Penalty:** Any person who acts as a tout while his name is included in the list of touts will be punished with imprisonment up to three months, a fine up to Rs 500, or both.

14TH DECEMBER

1. Vyommitra: Vyommitra is a combination of two Sanskrit words **Vyoma (Space) and Mitra (Friend)**. It is a **female robot designed and developed by the ISRO** to fly aboard unmanned test missions ahead of the Gaganyaan human spaceflight mission. **It is referred to as a half-humanoid robot** as she doesn't have legs. However, she can bend forward and sideways. Besides going on uncrewed Gaganyaan missions, she will accompany astronauts on manned missions too. **The AI-enabled robot, which can withstand vibrations and shock during the flight, has been designed to resemble a human with facial expressions, speech, and sight capabilities.** It is equipped with the capability to monitor module parameters, issue alerts, and execute life

support operations. It can perform tasks such as operating switch panels, and serving as a companion to astronauts, engaging in conversations, recognising them, and responding to their inquiries.

2. European Free Trade Association (EFTA): It is an **intergovernmental organisation established in 1960 by the Stockholm Convention**. The objective is to promote free trade and economic integration between its members within Europe and globally. **EFTA currently has four member countries: Iceland, Liechtenstein, Norway, and Switzerland.** The EFTA members are all open, competitive economies committed to the progressive liberalisation of trade in the multinational arena as well as in free trade agreements. **In contrast to the European Union (EU), EFTA is not a customs union.** This means that the individual EFTA States are free to set their own customs tariffs and arrange other foreign trade measures vis-à-vis the non-EFTA States. The association is responsible for the management of: the free trade between the EFTA countries; EFTA's participation in the European Economic Area (EEA), which includes the European Union and three EFTA countries (Iceland, Liechtenstein, and Norway, but not Switzerland); EFTA's worldwide network of free trade agreements. The EFTA countries have developed one of the largest networks of Free Trade Agreements (FTAs). These FTAs span over 60 countries and territories, including the EU.

3. ENACT Partnership: Enhancing Nature-based Solutions for an Accelerated Climate Transformation (ENACT) was launched by Germany and Egypt along with the International Union for Conservation of Nature. It was launched at the Conference of Parties (COP27), which took place at Sharm el-Sheikh, Egypt in 2022. Other member countries: Canada, European Union, France, Japan, Malawi, Norway, Republic of Korea, Slovenia, Belgium, Pakistan, Spain, the Netherlands, Switzerland and the United States. **It is an ambitious global initiative that seeks to coordinate global efforts to address climate change, land and ecosystem degradation, and biodiversity loss through Nature-based Solutions.**

It aims to:

- Enhance the protection from and resilience to climate impacts of at least 1 billion vulnerable people.
- **Secure up to 2.4 billion hectares of healthy natural and sustainable ecosystems,** and significantly increase global mitigation efforts through protecting and restoring carbon-rich ecosystems.
- **Secretariat:** International Union for Conservation of Nature (IUCN) hosts its secretariat.

16TH DECEMBER

1. INS Tarmugli: It is the **first Follow-on Water Jet Fast Attack Craft (WJFAC), is an improved version of WJFAC, earlier constructed by GRSE.** It is built by M/s Garden Reach Shipbuilders and Engineers Ltd (GRSE). It is conceived, designed and built indigenously. **It would be deployed for coastal patrol and surveillance operations along the East Coast of India.** It is named after a picturesque island in the Andaman group. The ship is capable of operating in shallow waters at high speeds and is equipped with enhanced fire power. **It is built for extended coastal and offshore surveillance and patrolling.**

2. Social Stock Exchange: Recently, the Unnati Foundation became the first entity to list on the social stock exchanges (SSE). It **functions as a separate segment within the existing stock exchange and help social enterprises raise funds from the public through its mechanism.** It would serve as a medium for enterprises to seek finance for their social initiatives, acquire visibility and provide increased transparency about fund mobilisation and utilisation. **Retail investors can only invest in securities offered by for-profit Social Enterprises (SEs) under the main Board.** In all other cases, only institutional investors and non-institutional investors can invest in securities issued by SEs. **Any social enterprise, Non-Profit Organisation (NPOs) or For-Profit Social Enterprises (FPEs), that establishes its primacy of social intent can get registered or listed on the Social Stock Exchange segment.** As per the SEBI's regulation, the enterprises must be serving to: eradicate either hunger, poverty, malnutrition and inequality; promoting education, employability, equality, empowerment of women and LGBTQIA+ communities; working towards environmental sustainability; protection of national heritage and art or bridging the digital divide, among other things.

3. PACE Mission: The mission will employ **advanced polarimeters to study the interplay of light, aerosols, and clouds, contributing to a deeper comprehension of their impact on air quality and climate.** The PACE mission will not only analyse aerosols but also delve into studying the colour of the ocean. The primary science instrument for PACE is the Ocean Colour Instrument (OCI) which is designed to measure the ocean's colour across a spectrum from ultraviolet to shortwave infrared. **It will feature two polarimeters – the Spectropolarimeter for Planetary Exploration (SPEXone) and the Hyper Angular Research Polarimeter (HARP2).** These two working together will offer complementary spectral and angular sampling, polarimetric accuracy, and spatial coverage. **This combination aims to provide improved atmospheric correction and a comprehensive range of aerosol and cloud science data.**

4. International Energy Agency (IEA): The International Energy Agency (IEA) recently said the "explosive growth" in Indian oil product consumption may be coming to an end. **IEA is an international intergovernmental organisation based in Paris that was established in 1974.** Its stated mandate is to maintain the stability of the international oil supply. **IEA's mandate has expanded over time to include tracking and analysing global key energy trends, promoting sound energy policy, and fostering multinational energy technology cooperation.** It was created in response to the 1973-1974 oil crisis, when an oil embargo by major producers pushed prices to historic levels and exposed the vulnerability of industrialised countries to dependency on oil imports. **The IEA operates within the broader framework of the OECD. It consists of 31 member countries and eleven association countries.**

17TH DECEMBER

1. Rail Kaushal Vikas Yojana: It was **launched by Indian Railways in September 2021 with the noble objective of providing technical skill training to youth across various industry-relevant trades.** Launched to address the needs of candidates within the age bracket of 18 to 35, the program was designed to equip them with the necessary skills for jobs across various sectors. **Key Features:**

- **Targeted Skill Development:** The program is designed to address the specific skill gaps prevalent in the job market.
- **Training Locations:** Recognizing the diversity and vast geographical spread of potential participants, the scheme ensures accessibility by establishing training centers at various locations across the country.
- **Age-Appropriate Training:** With a specific emphasis on the age group of 18 to 35, the program targets individuals at a crucial stage in their professional development.
- **Collaboration with Industry Experts:** To ensure the relevance and effectiveness of the training modules, the scheme involves collaboration with industry experts and professionals.
- **Certification and Recognition:** Successful completion of the program results in certifications that are recognized by the Railways.

2. Nyholm prize: It is awarded **to inspirational, innovative and dedicated individuals or teams making a substantial and sustained impact within education.** It celebrates individuals working in primary, secondary, further education, and higher education, encompassing teachers, technicians, and more. **It recognises a major national or international research or innovation contribution to the field of chemical science education.** **This prize was established to commemorate the life and work of Sir Ronald Nyholm, president of the Royal Society of Chemistry from 1968 to 1970.** It is awarded annually. **The prize alternates between being open to**

nominees both in the UK and Ireland and internationally, and open only to nominations from the

UK and Ireland. For 2023, the prize was open to nominees based anywhere in the world. The winner(s) receives £5000, a medal and a certificate. The winner(s) will complete a series of lectures or workshops in the UK. **The winner(s) will be chosen by the Education Prize Committee.**

3. New COVID-19 variant JN.1 case: Kerala reports new COVID-19 variant case recently. The sub-variant is not entirely new and has been detected in small numbers in many countries for several months now. **The sub-variant JN.1 is a close relative of the 2.86 variant, commonly referred to as Pirola. Pirola was on the watchlist of scientists as a variant of interest because of more than 39 mutations it carried on the spike protein as compared to its predecessor.** It carries just one additional mutation in the spike protein as compared to its relative. Mutations on the spike protein of Sars-CoV-2 are important because they are the ones that attach to receptors on human cells and allow the virus to enter it.

18TH DECEMBER

1. Mount Vinson: Recently, Kerala government employee Shaikh Hassan Khan has climbed Mount Vinson. **It is the highest mountain in Antarctica.** Mount Vinson rises 4,892 metres (16,050 feet) above sea level. **It is part of the Sentinel Range of the Ellsworth Mountains,** near the Ronne Ice Shelf. There are five other tall mountains in the same area as Mount Vinson—the next five highest summits on the continent of Antarctica—which are collectively referred to as Vinson Massif. It is located about 1,200 kilometres from the South Pole, one of the coldest places on Earth.

2. Guru Teg Bahadur: Recently, the Prime Minister of India paid tributes to Sri Guru Teg Bahadur on his martyrdom day. **Guru Teg Bahadur's name earlier was Teyag Mal. He was the ninth of ten Gurus of the Sikh religion.** His father and the sixth Guru of Sikhs, Guru Hargobind Sahib changed the name to Teg Bahadur. He got his name from his fighting and sword skills on the battlefield. **He built the city of Anandpur Sahib (in Rupnagar/Ropar district, on the edge of Shivalik Hills, near the Sutlej River, in Punjab).** Here the last two Sikh Gurus lived and where **Guru Gobind Singh founded the Khalsa Panth in 1699.** He contributed more than 100 poetic hymns to Granth Sahib which cover various topics, such as the nature of God, human attachments, body, mind, dignity, service etc. **He was instrumental in the conciliation between Raja Bishan Singh and Raja Paranpal, thus avoiding a war.** He was first arrested by the Mughals on the orders of Aurangzeb in 1665. He was publicly beheaded in 1675 on the orders of Mughal

emperor Aurangzeb in Delhi.

3. Noma disease: Recently, the World Health Organization (WHO) announced the inclusion of noma in its official list of neglected tropical diseases (NTDs). **It is a rapidly progressing severe gangrenous disease of the mouth and the face. The disease, also called cancrum oris or gangrenous stomatitis, is mostly found in sub-Saharan Africa.** It mostly affects children aged 2–6 years suffering from malnutrition, affected by infectious diseases, living in extreme poverty with poor oral health or with weakened immune systems. **It can also occur among immunocompromised adults due to HIV, leukaemia and other diseases. It starts as a soft tissue lesion (a sore) of the gums.** It then develops into an acute necrotizing gingivitis that progresses rapidly, destroying the soft tissues and further progressing to involve the hard tissues and skin of the face. It is generally considered an opportunistic and non-contagious disease. Indeed, cases are seen in African countries outside this area as well as in other parts of the world, including Asia and Asia-Pacific, the Americas, the Middle East and Europe. Evidence indicates that the causative agents of noma are non-specific polymicrobial organisms. There is no documented evidence to support direct transmission from person to person. Early detection is essential, as therapy is most effective at the early stages of disease when it appears as aggressively swollen gums.

4. LEADS Report: As many as 11 States and two UTs have been named as 'Achievers' in the LEADS [Logistics Ease Across Different States] 2023 report. **LEADS was conceived on the lines of the Logistics Performance Index of World Bank in 2018 by the Department for Promotion of Industry and Internal Trade (DPIIT), MoC&I.** While the LPI relies entirely on perception-based surveys, LEADS incorporates both perception as well as objectivity thereby enhancing the robustness and comprehensiveness of this exercise. The LEADS highlights shift in States' performance across the key pillars - Logistics Infrastructure, Logistics Services and Operating and Regulatory Environment. It highlights an enhanced overall stakeholder perception and impact of various reforms, across States and UTs.

19TH DECEMBER

1. TEMPO satellite: Tropospheric Emissions Monitoring of Pollution (TEMPO) monitors major air pollutants across North America. Its monitoring range extends from Canada's oil sands to the Yucatán Peninsula and across the Atlantic to the Pacific Ocean. **It is part of a virtual constellation with South Korea's Geostationary Environment Monitoring Spectrometer (GEMS) and the European Space Agency's upcoming satellite,** aiming for comprehensive air pollution monitoring over the Northern Hemisphere. It will make important scientific observations, including that of ozone, nitrogen oxide,

sulphur dioxide and formaldehyde levels. **It is capable of measuring air quality over North America hourly during the daytime with a resolution of several square miles.** It monitors the effects of everything from rush-hour traffic to pollution from forest fires and volcanoes. The present pollution-monitoring satellites are in low Earth orbit (LEO), but this new monitoring instrument is hosted in geostationary orbit. It was designed for a 20-month operation.

2. Yogmaya Temple: Yogmaya Temple is a historically important monument believed to be standing at the site of an ancient temple that is said to have come up during the period of the Mahabharata. **It is also known as the Jogmaya Temple, is an ancient Hindu shrine situated in the heart of Mehrauli (Delhi),** a few hundred metres away from the famous Qutub Minar. It was built by a noble in the court of Mughal Emperor Akbar II by the name of Lala Sidhu Mal between 1806 and 1837. **The area was known as Yoginipura in ancient Jain texts and Prithviraj Chauhan himself was said to have patronised a Yogini temple here shortly before his city's destruction.** It was a focal point of Akbar II's rule. **The temple has a replica of the Goddess Yogmaya, also called the "Pure Goddess.** The most famous festival celebrated only in this temple is the 'Phoolwalon ki Sair.'

3. National Geoscience Data Repository Portal: The Union Ministry of Mines is to launch the National Geoscience Data Repository (NGDR) Portal in a ceremony in New Delhi. **It is a comprehensive online platform for accessing, sharing, and analysing geospatial information across India.** The NGDR initiative was spearheaded by the Geological Survey of India (GSI) and Bhaskaracharya Institute of Space Applications and Geoinformatics (BISAG-N). It represents a significant leap forward in democratising critical geoscience data, empowering stakeholders across industries and academia with unprecedented access to invaluable resources.

4. The Internet and Mobile Association of India (IAMAI): Established in 2004, the IAMAI is a not-for-profit industry body registered under the Societies Registration Act, 1860. **It is the country's only organisation representing the digital services industry, with over 500 Indian and multinational corporations as its members,** which include established companies in diverse sectors of the digital ecosystem as well as start-ups. **The mandate is to expand and enhance the online and mobile value-added services sectors.** It is dedicated to presenting the unified voice of the businesses it represents to the government, investors, consumers, and other stakeholders. The association addresses the issues, concerns, and challenges of the Internet and Mobile economy and takes a leading role in its development. **IAMAI represents varied sectors such as digital advertising, digital entertainment, traveltech,**

online gaming, digital payments, fintech, digital commerce, edtech, healthtech, agritech, big data, ML, AI & IoT, AR/VR, logistics-tech, and so on.

20 DECEMBER

1. National Culture Fund: It was set up by the Government of India as a Trust under the Charitable Endowment Act, 1890 through a Gazette Notification in 1996. **It was established as a funding mechanism distinct from the existing sources and patterns of funding for the arts and culture in India.** It will enable institutions and individuals to support arts and culture directly as partners with its government. **It is managed and administered by a Council and an Executive Committee to actualize those policies. The Council is chaired by the Union Minister of Culture and has a maximum strength of 24 including both the Chairman and Member Secretary.** It has members representing the corporate and public sector, private foundations and non-profit organisations. **The Executive Committee is chaired by the Secretary, Ministry of Culture.** The donations to the national Culture Fund will be eligible for tax benefit under the Income Tax Act.

2. Late Blight disease: It is caused by the fungus *Phytophthora infestans*. It is **the most important disease of potato that can result in crop failures in a short period if appropriate control measures are not adopted.** It is common in humid regions with temperatures. **The first symptoms of late blight appear as small, light to dark green, circular to irregular-shaped water-soaked spots.** During cool, moist weather, these lesions expand rapidly into large, dark brown or black lesions, often appearing greasy. A pale green to yellow border often surrounds the lesions. The infected tubers and the infected soil may serve as a source of primary infection. The diseased tubers are mainly responsible for persistence of the disease from crop to crop. **The air borne infection is caused by sporangia.** This disease can be controlled by the prompt destruction of infected crop residue from the field to prevent the spread of the disease to nearby fields.

3. Akash Missile (SAM) Defence System: It is a Short-Range Surface-to-Air Missile (SRSAM) Defence System to protect vulnerable areas and points from air attacks. **It was indigenously designed and developed by the DRDO.** It can simultaneously engage multiple targets and destroy manoeuvring targets, including unmanned aerial vehicles, fighter aircraft, cruise missiles, and missiles launched from helicopters. **It has built-in Electronic Counter-Counter Measures (ECCM) features.** The entire weapon system has been configured to be launched from static or mobile platforms such as battle tanks and wheeled trucks, providing flexible deployment. It is road and rail transportable, with quick mobilisation and deployment capabilities. **It can engage aerial targets up to a range of approximately 25 km.**

4. Chit Funds: Chit funds are a financial instrument that is used in both borrowing and saving aspects. Chitfund is also termed Kuri and Chitty. **Chit funds are a kind of financial arrangement wherein a few individuals gather and pool a fixed sum of money at regular intervals.** This is done with an understanding or agreement that a single member of the group will receive the total sum of money collected during each interval. This process continues until every member has received their share of the pooled money. **This type of financial instrument is generally conducted by a chit-fund company that is responsible for the smooth carrying out of this process.** Under a chit fund scheme, a number of individuals make contributions towards the chit value at regular intervals for a period equal to the total number of subscribers or members (investors). A person, chosen through an auction or a lucky draw, receives the money collected. Through an auction allotment system, an individual who agrees to receive the lowest amount (with the lowest bid) gets the money. **It is known as a reverse auction system.**

21ST DECEMBER

1. Sahitya Akademi Award: Recently, Tamil author Rajasekaran (Devibharathi), Telugu writer T. Patanjali Sastry and Malayalam litterateur E.V. Ramakrishnan were among those named for the Sahitya Akademi Awards for the year 2023. It is awarded for the most outstanding books of literary merit published in any of the major Indian languages recognised by the Akademi. **Akademi gives 24 awards annually to literary works in the languages it has recognized and an equal number of awards to literary translations from and into the languages of India.** Besides the 22 languages enumerated in the Constitution of India, the Sahitya Akademi has recognised English and Rajasthani as languages in which its programme may be implemented. The award, in the form of a casket containing an engraved copper-plaque, a shawl and 1,00,000 rupees will be presented.

2. RAMP Programme: The Raising & Accelerating MSME Performance (RAMP) programme is assisted by the World Bank. **It aims to improve the performance of micro, small, and medium enterprises (MSMEs) in India. It was launched in 2022.**

Objectives:

- Improving access to market and credit for MSMEs
- Strengthening institutions and governance at the central and state levels
- Improving centre-state linkages and partnerships
- Addressing issues of delayed payments

The National MSME Council has been set up by the Ministry to work as an administrative and functional body of the RAMP Programme.

3. Major Dhyan Chand Khel Ratna Award: Named after

the hockey wizard **Major Dhyan Chand (1905–79), an Indian legendary field hockey player, the "Major Dhyan**

Chand Khel Ratna Award" (erstwhile Rajiv Gandhi Khel Ratan Award) is the highest sporting honour in India. Instituted in 1991–1992, the award is conferred annually by the Ministry of Youth Affairs and Sports. **The spectacular and most outstanding performance in the field of sports and games at the international level, i.e. Olympic/Asian/Commonwealth/World Games/Championships/World Cup and equivalently recognized international tournaments,** by a sportsperson over a period of four years immediately preceding the year during which the award is to be given. During the years when Olympic Games, Commonwealth Games and Asian Games are held, the achievements of the sportspersons in these Games and other abovementioned tournaments up to the conclusion of the Olympic Games/Commonwealth/Asian Games, as the case may be, will also be considered. Sportspersons who have been penalised or against whom an enquiry is pending or ongoing for the use of drugs/substances banned by the World Anti-Doping Agency (WADA) will not be eligible for the award.

No award will be made for a second time to the same person. There will be only one award every year to be given to an individual sportsperson. This condition will be relaxed only in exceptional circumstances. **The award may be given posthumously if such an occasion arises.** The Government of India may cancel or annul the award for any recipient for specific reasons, including doping. The award will consist of the following: A cash amount of ₹25,00,000, which is exempt from income tax and wealth tax. A Certificate of honour to each sportsperson. One medal to each sportsperson.

22ND DECEMBER

1. PM-AJAY Scheme: Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM- AJAY) is a 100% Centrally Sponsored Scheme. It is a **merged scheme of three Centrally Sponsored Schemes, namely Pradhan Mantri Adarsh Gram Yojana (PMAGY), Special Central Assistance to Scheduled Castes Sub Plan (SCA to SCSP), and Babu Jagjivan Ram Chhatrawas Yojana (BJRCY).** The main objective of the scheme is to **increase the income of the target population by way of various income generating schemes, skill development and infrastructure development.** It is to reduce the poverty among the target population and bring them above the poverty lines. **The Scheduled Castes persons living below the poverty lines are eligible for getting benefits under this scheme.** In case of Infrastructure Development, the villages having 50% or more SC population are eligible for grants under the scheme.

2. Central Industrial Security Force: It was established after the recommendation of the Justice Mukherjee

Commission. It was set up by an Act of Parliament on **March 10, 1969**. It is one of seven Central Armed Police Forces (CAPF) under the Ministry of Home Affairs — the other six being the Border Security Force, the Indo-Tibetan Border Police, the Sashastra Seema Bal, the Assam Rifles, the National Security Guard, and the Central Reserve Police Force. It is headed by an Indian Police Service officer with the rank of Director-General. Initially, its remit was restricted to protecting government-owned industries, but this was expanded to include joint-ventures and private undertakings in 2009. It also provides consultancy services to the private sector. **The force is deployed in over 350 locations across the country, in diversified areas such as atomic energy and space installations, sea-ports, steel plants, coal fields, hydro-electric and thermal power plants, defence production units, fertiliser and chemical industries, RBI's note-printing mints, heritage monuments such as the Taj Mahal. It has the largest percentage of women in its force, in comparison to all other CAPFs.** Presently, CISF is also providing security to the protected persons classified as Z Plus, Z, X, Y.

3. Winter Solstice: The winter solstice marks the shortest day of the year. **The Earth is tilted 23.4 degrees on its axis, so if the Earth's pole is pointing towards or away from the Sun during the day, the arc the Sun travels through will rise and fall during the year.** Winter Solstice happens when one of the Earth's poles is far away from the Sun. **It falls on December 21 or 22 in the Northern Hemisphere and June 20 or 21 in the Southern Hemisphere.** The word solstice is derived from the Latin word solstitium, where 'sol' means Sun and 'stitium' means to stop. During the winter solstice, the days are the shortest. The duration of daylight will vary across countries. The winter solstice is significant in many cultures since it marks the symbolic death and rebirth of the Sun.

4. Paat Mitro: It is a mobile application developed by the Jute Corporation of India Limited (JCI). **The purpose is to provide important information about Minimum Support Prices (MSP) and agronomy to jute farmers.** It is available in six languages. All the functionalities are made available to the users free of cost. **In addition to the latest agronomic practices and MSP, Jute Gradation Parameters, Farmer-centric schemes like 'Jute-ICARE', weather forecasts, JCI's Purchase Centres' locations, and Procurement Policies are also made available in the app.** Farmers will also be able to track the status of their payments for the raw jute sold to JCI under MSP Operation. **Latest technology features like Chatbot are included for their queries.**

25TH DECEMBER

1. Indian Ocean Naval Symposium: Recently, the 8th edition of Indian Ocean Naval Symposium (IONS)

Conclave of Chiefs (CoC) was conducted by Royal Thai Navy at Bangkok, Thailand. The 'Indian Ocean Naval Symposium' (IONS) is a voluntary initiative that seeks to increase maritime cooperation among navies of the littoral states of the Indian Ocean Region by providing an open and inclusive forum for discussion of regionally relevant maritime issues. **It was conceived by the Indian Navy in 2008 as a forum which seeks to enhance maritime cooperation among Navies of the littoral states of the Indian Ocean Region.** The inaugural edition of IONS was held in Feb. 2008 at New Delhi, with the Indian Navy as the Chair for two years (2008 - 2010). It endeavours to generate a flow of information between naval professionals that would lead to common understanding and possibly cooperative solutions on the way ahead.

2. Palna Scheme: The erstwhile National Creche Scheme has been reorganised and renamed as **Palna Scheme under the sub scheme 'Samarthya' of 'Mission Shakti'.** **Objectives:** To provide day-care facilities for children (6 months to 6 years) of working mothers in the community.

- To improve **nutrition and health status of children.**
- To promote **physical, cognitive, social and emotional development (Holistic Development)** of children.
- To educate and empower parents /caregivers for better childcare.

The scheme will provide an integrated package of the following services: Daycare Facilities including Sleeping Facilities, Early Stimulation for children below 3 years and Pre-school Education for 3 to 6 years old children, Supplementary Nutrition (to be locally sourced), Growth Monitoring, Health Check-up and Immunization. The scheme focuses on children of 6 months to 6 years, of working women in rural and urban areas who are employed for a minimum period of 15 days in a month, or six months in a year.

3. NASAMS (National Advanced Surface-to-Air Missile System): It is a medium-range ground-based air defence system. **The NASAMS provides short- to medium-range air defence against aircraft, helicopters, cruise missiles, and drones.** This air defence system is stationary. It is best suited to defend important stationary assets, such as key military assets, infrastructure, or cities. **It was designed and developed jointly by Raytheon (United States) and Kongsberg Defence & Aerospace (Norway).** **NASAMS is operated by 13 countries and has been integrated into the U.S. National Capital Region's air defence system since 2005.** In addition to the U.S., Norway, Finland, Spain, Netherlands, Oman, Lithuania, Indonesia, Australia, Qatar, Hungary, Ukraine, and one undisclosed country depend on NASAMS for homeland defence and the protection of critical assets. **It is the world's first networked short- and medium-range air defence system that could integrate with other**

equipment and air defence systems. It features an X-Band, 360-degree phased array air defence radar with a 75-kilometre range to identify targets.

The NASAMS is armed with three launchers, each carrying up to six missiles. **The system can engage 72 targets simultaneously in active and passive modes. The NASAMS is fitted with a fire distribution centre (FDC) command-and-control unit to perform battle management command, control, communications, computers, and intelligence functions.**

26TH DECEMBER

1. Veer Bal Diwas: It is commemorated to honour the martyrdom of **Baba Fateh Singh and Zorawar Singh, the Sahibzade of 10th Guru Govind Singh Ji on 26th December every year.** Guru Gobind Singh, the leader of the Sikhs in Punjab during the Mughal reign, had four sons. **They were referred to as the four Sahibzade Khalsa. In 1699, Gobind Singh established the Khalsa.** This elite warrior band had devout Sikhs with the aim to protect the innocent from religious persecution. While two of Guru Gobind Singh's sons were killed fighting the Mughals, two other sons were bricked alive on the orders of Aurangzeb's governor of Sirhind. **The two younger sons, Sahibzada Zorawar Singh ji and Sahibzada Fateh Singh ji, attained martyrdom after being sealed alive in a wall.**

2. Guru Gobind Singh: He was the 10th Sikh guru. He became the Sikh guru at the age of nine, following the demise of his father, Guru Tegh Bahadur, the ninth Sikh Guru. He is known for his significant contributions to the Sikh religion, including the introduction of the turban to cover hair. **He is renowned for founding the principles of Khalsa or the Five 'K's i.e. kesh (uncut hair), kanga (wooden comb), kara (iron or steel bracelet), kirpan (dagger) and kachera (short breeches).** He fought against the Mughals later in the battle of Muktsar in 1705.

3. OSIRIS-APEX: It is a mission to study the physical changes to asteroid Apophis that will result from its rare close encounter with Earth in April 2029. That year, Apophis' orbit will bring it within 20,000 miles (32,000 kilometres) of Earth's surface — closer to Earth than our highest-altitude satellites. **The mission aims to observe the physical changes induced by Earth's gravitational pull during Apophis' flyby.** These changes could include alterations in the asteroid's orbit, rotation speed, and surface features such as quakes or landslides. **Additionally, the OSIRIS-APEX spacecraft will dip toward the surface of Apophis.** In an unprecedented extension of its celestial duties, the spacecraft that delivered asteroid samples from Bennu, OSIRIS-REx, has embarked on a new mission, and NASA has renamed it as OSIRIS-APEX.

4. MedTech Mitra portal: It is an online portal that aims to assist medtech innovators in clinical evaluation, regulatory facilitation, and uptake of new products. **The portal will be coordinated collaboratively by the Indian Council of Medical Research (ICMR) and the Central Drugs Standard Control Organisation (CDSCO),** under the guidance of NITI Aayog's Atal Innovation Mission. **The MedTech Mitra platform, along with the recent medical devices policy and the production-linked incentive scheme, will together provide a boost to the medical devices sector and encourage domestic manufacturing of these devices.** The new initiatives would facilitate indigenous development of affordable, quality MedTech devices and diagnostics, leading to a considerable reduction in the import dependence of this sector. It will ensure ease of innovation and doing R&D for emerging start-ups. **It would provide end-to-end guidance to startups, making their journey from idea to product smooth.** The platform will also help them bridge gaps and help in animal as well as clinical trials. It would also foster partnerships between engineers, scientists and clinicians, which was lacking in the sector.

27TH DECEMBER

1. Colombo Security Conclave (CSC): It is a regional security grouping comprising India, Sri Lanka, the Maldives and Mauritius. The CSC, initially known as the **Trilateral for Maritime Security Cooperation,** evolved out of trilateral meetings between NSAs and Deputy NSAs from India, Maldives, and Sri Lanka, starting in 2011. **It came to a standstill after 2014 due to rising tensions between India and the Maldives.** After its revival and re-branding as the CSC in 2020, Mauritius was added as a member of the grouping. **Current members of CSC include India, Maldives, Mauritius, and Sri Lanka, while Bangladesh and Seychelles are the two observer nations.** Cooperation under the conclave focuses on five pillars – maritime safety and security, countering terrorism and radicalisation, combating trafficking and transnational organised crime, cyber-security and protection of critical infrastructure, and humanitarian assistance and disaster relief. **A permanent secretariat, based in Colombo, was established in 2021** to coordinate all activities and implement decisions made at the NSA level.

2. Central Water Commission (CWC): It is a premier technical organisation in India in the field of water resources. **It is presently functioning as an attached office of the Ministry of Jal Shakti, Department of Water Resources, River Development, and Ganga Rejuvenation,** Government of India. The Commission is entrusted with the general responsibilities of initiating, coordinating, and furthering, in consultation with the State Governments concerned, schemes for control, conservation, and utilisation of water resources

throughout the country for the purposes of Flood Control, Irrigation, Navigation, Drinking Water Supply, and Water Power Development. It also undertakes the investigation, construction, and execution of any such schemes as required. It is headed by a Chairman, with the status of Ex-Officio Secretary to the Government of India. **The work of the Commission is divided among three wings namely, the Designs and Research (D&R) Wing, the River Management (RM) Wing and the Water Planning and Projects (WP&P) Wing.** Each wing is placed under the charge of a full-time member with the status of Ex-Officio Additional Secretary to the Government of India. **Headquarters: New Delhi**

3. Chronic Wasting Disease (CWD): CWD, also known as **Zombie deer disease**, is a **neurological disorder affecting deer and other cervids (members of the deer family) caused by the abnormal growth of a misfolded protein called a prion.** This prion causes healthy brain proteins to become abnormal, leading to a range of symptoms. **CWD is contagious; it can be transmitted freely within and among cervid populations.** CWD is transmitted directly through animal-to-animal contact and indirectly through contact with objects or environments contaminated with infectious material (including saliva, urine, faeces, and carcasses of CWD-infected animals). It may take over a year before an infected animal develops symptoms, which can include drastic weight loss (wasting), stumbling, listlessness, and other neurologic symptoms. **CWD is particularly concerning because it has the potential to affect both animals and humans, with the possibility of transmission through the consumption of infected meat.** CWD can affect animals of all ages, and some infected animals may die without ever developing the disease. CWD is fatal to animals, and there are no treatments or vaccines.

28TH DECEMBER

1. Smart Lander for Investigating Moon (SLIM) Mission: Recently, Japan's Smart Lander for Investigating Moon (SLIM) spacecraft entered into orbit around the moon after months-long journey. **It is a spacecraft built and launched by the Japan Aerospace Exploration Agency (JAXA) on September 7, 2023, from the Tanegashima spaceport.** It weighed only 590 kg. **It was launched together with XRISM**, a next-generation X-ray space telescope, onboard an H-2A rocket. It entered into an elliptical orbit around the moon over three minutes or so. Its apogee (farthest point) in this orbit is 4,000 km and perigee (closest point) is 600 km above the lunar surface. Just before it lands, **SLIM will deploy two small rovers called Lunar Excursion Vehicle (LEV) 1 and 2.** LEV-1, LEV-2, and SLIM will together study the lunar surface near the landing point, collect temperature and radiation readings, and attempt to study the moon's mantle.

2. XRISM Mission: The X-Ray Imaging and Spectroscopy Mission (XRISM) is a joint mission of the Japan Aerospace Exploration Agency (JAXA) and the National Aeronautics and Space Administration (NASA), involving contributions from the European Space Agency (ESA). **The mission aims to observe X-rays coming from deep space and to identify their wavelengths with unprecedented precision.** It will use state-of-the-art spectroscopy to measure changes in the brightness of celestial objects at different wavelengths. **It detects X-rays with energies ranging from 400 to 12,000 electron volts.** (For comparison, the energy of visible light is 2 to 3 electron volts.) This range will provide astrophysicists with new information about some of the universe's hottest regions, largest structures, and objects with the strongest gravity.

3. Huntington's disease: It is a rare, inherited disease that causes the progressive breakdown (degeneration) of nerve cells in the brain. It has a wide impact on a person's functional abilities and usually results in movement, thinking (cognitive) and psychiatric disorders. **There are two types of Huntington's disease:**

- **Adult onset:** This is the most common form. Symptoms usually begin after age 30.
 - **Early onset (juvenile Huntington's disease):** Early onset affects children and teenagers. It's very rare. When Huntington's develops early, symptoms are somewhat different and the disease may progress faster.
- A genetic change (mutation) of the HTT gene causes Huntington's disease. **The HTT gene makes a protein called huntingtin. This protein helps your nerve cells (neurons) function.** The normal HTT gene contains a stretch of DNA that specifies the number of times the amino acid glutamine is repeated in the HTT. This number varies from 11 to 31. In the mutant versions of the HTT gene, this stretch is expanded to encode 35 or more repeats. As the number of repetitions increase, the severity of Huntington's disease increases and its debilitation begins at an earlier age. **Huntington's disease usually causes movement, cognitive and psychiatric disorders with a wide spectrum of signs and symptoms.** The patient suffers mood swings, has difficulty in reasoning, shows abnormal and uncontrollable jerky movements, and experiences difficulty in speaking, swallowing, and walking. Medications are available to help manage the symptoms of Huntington's disease. But treatments can't prevent the physical, mental and behavioural decline associated with the condition.

29TH DECEMBER

1. European Bank for Reconstruction and Development (EBRD): It is an international financial institution with the mandate to promote transition towards a sustainable, open-market economy and to foster innovation. **The**

EBRD was created in April 1991 to help Eastern European and ex-Soviet countries transition into democracies by developing free-market economies after the fall of communism. Headquarters: London. It provides project financing mainly for private enterprises, usually together with other commercial lending partners, in countries that are committed to, and apply, democratic principles. **It also works with public partners to support privatization, restructuring, and improvement of municipal services.** It does this by financing investments, providing business services, and getting involved in high-level policy dialogue in these countries to support the private sector development. It prioritizes support for countries in Central and West Asia, and North Africa. It focuses on advancing developmental goals in finance and policy reform. **The organization also promotes environmentally sustainable development and gender equality and promises to be fully transparent. The EBRD is owned by 72 countries, the European Union and the European Investment Bank.** Each shareholder is represented individually on the Board of Governors of the EBRD, which has overall authority over the Bank and is responsible for approving its overall strategic direction. **India became the EBRD's 69th shareholder when it joined the Bank in July 2018.**

2. James Webb Space Telescope (JWST): JWST was built in collaboration between NASA, the European Space Agency (ESA), and Canadian Space Agency. **It was launched in December 2021. It is the largest and most powerful space telescope to date.** It orbits around a point in space called the L2 Lagrange point (a gravitationally stable location in space). It is approximately 1.5 million km beyond Earth's orbit and is one of the five points in the orbital plane of the Earth-Sun system. **It will focus on four main areas: the first light in the universe, the assembly of galaxies in the early universe, the birth of stars and protoplanetary systems, and planets (including the origins of life).** Its instruments are designed to work primarily in the infrared range of the electromagnetic spectrum, with some capability in the visible range. **It comprises the Optical Telescope Element (OTE), the Integrated Science Instrument Module (ISIM), the sunshield, and the spacecraft bus.** The OTE is the eye of the Observatory. It consists of the mirrors and the backplane. The OTE gathers the light coming from space and provides it to the science instruments located in the ISIM. **The backplane is like the "spine" of Webb.** It supports the mirrors. The ISIM contains Webb's cameras and instruments. It integrates four major instruments and numerous subsystems into one payload. The sunshield separates the observatory into a warm sun-facing side (spacecraft bus) and a cold anti-sun side.

3. Pir Panjal Valley: It is a mountain range in the northern Indian Himalayas. **It starts in Ramban and extends westward in the south of Jammu and Kashmir**

to the last extremity of Muzaffarabad District. It is rising sharply to an average elevation of more than 13,000 feet. It separates the Jammu Hills to the south from the Vale of Kashmir, beyond which lie the Great Himalayas. It separates itself from the Himalayas near the bank of the Sutlej river and forms a divide between the rivers Beas and Ravi on one side and the Chenab on the other. **Six historical passes, Hajipir Pass, Gulabgarh Pass, Ratanpir Pass, Pir Panjal Pass, Banihal Pass, and Bairam Gala Pass are in this mountain range. Deo Tibba and Indrasan are two important peaks at the eastern end of the mountain range.**

30TH DECEMBER

1. Mumbai Trans Harbour Link (MTHL) Project: MTHL is a 21.8-kilometer, Road Bridge connecting the Indian city of Mumbai with Navi Mumbai, its satellite city. **It is the longest sea bridge in India.** The total length of MTHL Bridge is 21.8 km, of the length on the sea is 16.50 km and the land portion is 5.5 km. **The foundation stone for the MTHL project was laid in December 2016.** 85% of the MTHL project's construction is being financed by the Japan International Cooperation Agency (JICA). The Mumbai Metropolitan Region Development Authority (MMRDA) manages the MTHL construction. **The MTHL Bridge gives faster connectivity with the proposed Navi Mumbai International Airport, JNPT Port, Mumbai-Pune Expressway, and Mumbai-Goa Highway.**

2. Indian Olympic Association (IOA): The IOA is the governing body for the Olympic Movement and the Commonwealth Games in India. As an affiliated member of the International Olympic Committee (IOC), Commonwealth Games Federation (CGF), Olympic Council of Asia (OCA), and Association of National Olympic Committees (ANOC), the IOA administers various aspects of sports governance and athletes' welfare in the country. **IOA oversees the representation of athletes or teams participating in the Olympic Games, Commonwealth Games, Asian Games, and other international multi-sport competitions of the IOC, CGF, OCA, and ANOC.** Beyond participation in the Games, the IOA has also established various initiatives with different stakeholders for the development of sports education and Olympic studies. **IOA is recognised by the Ministry of Youth Affairs and Sports. It is registered as a Non-Profit Organisation under the Societies Registration Act of 1860.**

3. Parkinson's Disease: It is a progressive neurological disorder that affects the nervous system and the parts of the body controlled by the nerves. **It is a condition in which a patient has limited or no control over his movements and body balance.** The risk of developing Parkinson's disease naturally increases with age, and the average age at which it starts is 60 years old. **Many studies have suggested that men are more likely to be**

affected by Parkinson's than women. It is caused by the **degeneration of nerve cells in the part of the brain called the substantia nigra, which controls movement.** These nerve cells die or become impaired, losing the ability to produce an important chemical called dopamine. Dopamine operates with other neurotransmitters to help coordinate the millions of nerve and muscle cells involved in the movement.

4. Litchi cultivation: Litchi is a delicious juicy fruit of excellent quality. Botanically it belongs to Sapindaceae family. The translucent, flavoured aril or edible flesh of the litchi is popular as a table fruit in India. **Litchi is a sub-tropical fruit and thrives best under moist sub-tropical**

climate. Deep, well drained loamy soil, rich in organic matter and having pH in the range of 5.0 to 7.0 is ideal for the crop. **The temperature should not go beyond 40.5 degrees Celsius in summer and below freezing point in winter. Prolonged rain may be harmful especially at the time of flowering, when it interferes with pollination.** The young trees require protection against frost and hot winds for several years till they are firmly established, even though some variation in temperature is necessary for proper fruiting of trees. **Frost during winter and dry heat in summer are limiting factors for its successful cultivation. India is the second largest producer of litchi in the World after China.**



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PLACES IN NEWS

1. Lithuania (Capital: Vilnius):

- India and Lithuania held a meeting to strengthen maritime bilateral relations.
- **Political features**
- **Location:** Located in northeastern Europe, the southernmost and largest of the three Baltic states (other two Estonia, and Latvia).
- **Boundaries:** Latvia to the north, Belarus to the east and south, Poland and the detached Russian oblast of Kaliningrad to the southwest, and the Baltic Sea to the west.
- **Geographical features:**
 - **Important Rivers:** Nemunas River
 - **Largest lake:** Lake Drūkšiai
 - **Highest Point:** Aukštojas Hill
 - **Language:** Lithuanian is considered the oldest surviving Indo-European language in the world



2. Venezuela (Capital: Caracas):

- India set to resume import of oil from Venezuela after 3 years as US sanctions on Caracas ease.
- **Political features**
- **Location:** Located at the northern end of South America.
- Not a landlocked country and opens into Caribbean Sea and the Atlantic Ocean to the north.
- **Political boundaries:** Bounded by Guyana, Brazil, and Colombia.
- **Geographical features:**
 - **Major Mountain:** Andes Mountains
 - **Rivers:** Rio Negro, Orinoco River
 - **Major lake:** Lake Maracaibo (largest lake in South America)
 - **Highest Point:** Bolívar Peak



3. Nepal (Capital: Kathmandu):

- Recently, Nepal has become the first South Asian nation to formally register same-sex marriage.
- **Political Features**
- Located along the southern slopes of the Himalayan mountain ranges.
- It is a **landlocked country located between India to the east, south, and west and the Tibet Autonomous Region of China to the north.**
- **Geographical Features**
- The country can be divided into five major physiographic regions: the Terai, Churia hills or Siwaliks, middle hills or mid-mountains, high mountains, and high Himalayas, stretching in parallel belts in succession from south to north.
- **Major rivers** – Kosi, Nārāyani (Gandak), Karnālī, etc.
- **Highest Point:** Mount Everest.



4. Philippines (Capital: Manila):

- A Strong earthquake of magnitude 7.6 sparked a tsunami warning in the Philippines.
- **Political Features:**
- It is an **archipelago in South-eastern Asia between the South China Sea and the Pacific Ocean.**
- It is divided into three island groups: **Luzon (largest island of country), Visayas, and Mindanao.**
- It is bounded by Philippine Sea, Celebes Sea, Sulu Sea and South China Sea.
- **Geographical Features:**
- Islands are composed primarily of volcanic rock and coral.
- **Highest point:** Mount Apo (active volcano)
- **Largest Lake:** Laguna de Bay
- **Major Rivers:** Cagayan and Rio Grande de Mindanao

5. Seychelles (Capital: Victoria):

- Seychelles declares state of emergency after explosion amid flooding.
- **Political features**
- Island republic in western Indian Ocean, comprising about 115 islands.
- Major islands of Seychelles are located east of Kenya and northeast of Madagascar.
- **Geographical features**
- **Highest point:** Morne Seychellois
- Consists of both coral and rocky islands with narrow coasts.
- **Climate:** Wet Tropical.
- Drainage system consists of only small streams and lake



6. Guyana (Capital: Georgetown):

- Venezuela, Guyana saw tensions over a border dispute around the Esequibo river, and an offshore area.
- **Political features**
- North eastern corner of South America.
- Not landlocked.

- Bordered by Atlantic Ocean (north), Suriname (east), Brazil (south), and Venezuela (west).
- **Geographical features**
- **Mountains:** Acarai Mountains, Pakaraima Mountains, Kanuku Mountains.
- **Highest point:** Mount Roraima (2,772 metres).
- **Main rivers:** Courantyne, Berbice, Demerara, and Essequibo (all empty into Atlantic)



7. Slovenia (Capital: Ljubljana):

- 23rd Meeting (COP23) of Barcelona Convention took place in Slovenia.
- Convention provides for protection of the Mediterranean Sea against pollution.
- **Political Features:**
- Located in central Europe.
- It borders Italy (West), Austria (North), Croatia (South) and Hungary (North East).
- It also borders with the Adriatic Sea.
- **Geographical Features:**
- **Physiographic regions:** European Alps, the karstic Dinaric Alps, the Pannonian and Danubian lowlands and hills, and the Mediterranean coast.
- **Highest Point:** Mount Triglav
- **Major Rivers:** Sava, Drava, Mura, etc.



8. Poland (Capital: Warsaw):

- Donald Tusk becomes Poland's new Prime Minister.
- **Political features**
- It lies in **Central Europe**.
- It is bordered Baltic Sea (North), Russia and Lithuania (northeast), Belarus and Ukraine (East), Slovakia and Czech Republic (South), Germany (West).
- It is a **member of European Union**.
- **Geographical features**
- **Major Mountains:** Carpathians, Sudeten and Tatra mountains
- **Major Rivers:** Vistula, Neisse, Oder, and Motlawa.



9. Iran (Capital: Tehran):

- Iran has decided to unilaterally cancel visa requirements for Indian visitors.
- **Political Features:**
- It lies in the South-western Asia.
- It is bordered by Armenia and Azerbaijan (North), Turkmenistan (North East), Afghanistan and Pakistan (East), and Iraq and Turkey (west).
- It also borders with Caspian Sea (North), and Persian Gulf and Gulf of Oman (South).
- **Geographical features:**
- **Major Mountains:** Elburz and Zagros
- **Major Rivers:** Karun, Karkeha and Zayandeh
- **Major Deserts:** Dasht-e Kavir and Dasht-e Lut
- **Highest Point:** Mount Damavand



10. Iceland (Capital: Reykjavik):

- After weeks of intense earthquake activity, a volcano has erupted on Reykjanes peninsula in Iceland.
- **Political features**
- Island country located in North Atlantic Ocean.
- A **member of North Atlantic Treaty Organization (NATO)** since its foundation in 1949.
- Its coastline meets Greenland Sea (north), Norwegian Sea (east), Atlantic Ocean (south and west), and Denmark Strait (northwest) which separates it from Greenland.
- **Geographical features**
- **Highest point:** Hvannadals Peak.
- **Longest River:** The Þjórsá River.
- Located on Mid-Atlantic Ridge which results in volcanoes reaching deep into unstable interior of Earth.



11. Papua new Guinea (Capital: Port Moresby):

- Recently \$1 million relief assistance announced by India for the volcanic eruption at Mount Ulawun affected people of Papua New Guinea.
- **Political features**
- It is an island country in the southwestern Pacific Ocean.
- Situated between the Coral Sea and the South Pacific Ocean.

- It has Indonesia in the west, Australia in the South, Solomon Islands in the East.
- **Geographical Features**
- **Highest point:** Mount Wilhelm in the Bismarck Range
- **Major Rivers:** Sepik, Ramu, Fly.



- **Political features**
- Country of Southeast Asia.
- **Composed of two non-contiguous regions:**
- Peninsular Malaysia (West Malaysia) is on Malay Peninsula.
- East Malaysia (Malaysia Timur) is on island of Borneo.
- Bordering countries: Thailand, Singapore, Indonesia, and Brunei.
- Bordering water bodies: Strait of Malacca, South China Sea.
- **Geographical features**
- Lying just north of Equator.
- **Major Rivers:** Pahang, Rajang, Kinabatangan.
- **Highest Point:** Gunung Kinabalu (4100m).



12. Malaysia (Capital: Kuala Lumpur):

- Cabinet approved MoU for Cooperation between Prasar Bharati and Radio Televisyen Malaysia.



EDUFACTS

1ST DECEMBER

1. Climate change is causing a marine phenomenon known as **tropicalisation**, where **tropical species expand their range while temperate species retract**. Temperate species are receding as it gets too warm, they face increased competition for habitat, and new predators arrive on the scene.
2. Postal ballots serve as a **voting option for service voters**, absentee voters (such as those above 80 years, individuals with benchmark disabilities, or those affected by Covid-19), voters on election duty, and electors under preventive detention.
3. One of the ways that plants communicate is by releasing and sensing airborne chemicals called Green leaf volatiles (GLVs). **GLVs, emitted by plants when injured, create the pleasant smell of fresh cut grass for humans**. However, to neighboring plants, this scent functions as a warning signal, indicating potential danger.

2ND DECEMBER

1. Through an amendment to the **Finance Act 2017**, the Union government has **exempted political parties from disclosing donations received through electoral bonds**. This means the voters will not know which individual, company, or organization has funded which party, and to what extent.
2. According to data from the Ministry of Law and Justice till May 2023, **Delhi's Fast Track Special Courts (FTSCs) have a disposal rate of only 19%**, which is one of the lowest in the country.
3. There is a significant drop of over **8.5% in enrollment of Muslim students** (age group 18-23) in higher education in 2020-21.

4TH DECEMBER

1. Fast Radio Bursts (FRBs) are **powerful and brief bursts of radio frequency emissions originating from deep space**. These mysterious and intense signals last only milliseconds but release an amount of energy comparable to hundreds of millions of suns.
2. Sri Lanka's debt to China is 52% of its bilateral debt, 19.5% to Japan, and 12% to India.
3. Recently, **The Government of India and Government of Manipur signed a Peace Agreement with United National Liberation Front (UNLF)**, which is oldest valley-based insurgent group of Manipur. This marks the **first instance where a Manipuri armed group from the valley has chosen to abandon violence**, returning

to mainstream society while committing to respect the Constitution of India and abide by the country's laws.

5TH DECEMBER

1. The BSF was raised in **1965**, after the India-Pakistan war. It is **one of the seven Central Armed Police Forces** of the Union of India under the administrative control of the Ministry of Home Affairs (MHA)
2. The IMO (International Maritime Organisation) is a specialized agency of the United Nations (UN) that is responsible for **regulating shipping and preventing marine pollution from ships**. **IMO celebrates World Maritime Day every last Thursday of September**, to highlight the importance of shipping and maritime activities.
3. It is estimated that globally 39 million persons are living with HIV (Human Immunodeficiency Virus). In India the figure is 2.4 million.

6TH DECEMBER 2023

1. IK Gujral can be remembered for two significant contributions to Indian foreign policy: He propounded the '**Gujral doctrine**' when he was the Union minister of External Affairs from 1996 to 1997. And, despite international pressure, **Gujral firmly refused to sign the Comprehensive Test Ban Treaty (CTBT) in October 1996**.
2. For a nuanced analysis of quarterly economic trends, **GVA numbers are often considered more reliable**, while GDP (expenditure data) is preferred for assessing annual trends
3. **GIAN is a flagship initiative by the Ministry of Education (MoE)** which aims to bring in distinguished scholars worldwide to teach at Indian universities. Of the delivered courses, 39% took place in IIT campuses, with the second-largest share occurring in National Institute of Technology (NIT) campuses.

7TH DECEMBER

1. The **decade 2011-2020** emerged as the warmest on record for both land and ocean.
2. As per the Union Budget announcement for Financial Year 2022-23, **the 12 DTH Channels have been expanded to 200 PM e-VIDYA DTH TV Channels** to enable all States to provide supplementary education in various Indian languages for classes 1-12.
3. India has the biggest burden of deaths due to

Snake Bites in the world, with most of the cases in rural India

8TH DECEMBER

1. The initial four general elections in India synchronized Lok Sabha and State Assembly elections. Presently, Lok Sabha elections align with Assembly polls in **Andhra Pradesh, Odisha, Arunachal Pradesh, and Sikkim**.
2. In India, **cities contribute 66% to the national GDP**, a number expected to rise to 80% by 2050.
3. The power to frame policy and legislation relating to minor minerals is entirely delegated to the State Governments while policy and legislation relating to the major minerals are dealt by the Ministry of Mines under the Union Government.

9TH DECEMBER

1. Approximately **36.5% of India's soil is deficient in zinc**. About 12.8% of the country's soil is deficient in iron.
2. National Medical Commission (NMC) was established in 2020 by **the National Medical Commission Act, 2019, replacing the Medical Council of India (MCI)**.
3. CHEOPS is **ESA's first space mission dedicated to studying bright, nearby stars** that are already known to host exoplanets, in order to make high-precision observations of the planet's size as it passes in front of its host star.

11TH DECEMBER

1. India heavily relies on imports for critical minerals like **lithium and nickel**, with 100% import reliance for lithium and nickel, and 93% for copper.
2. In **RMD Chamarbaugawala v. Union of India**, the Supreme Court relied on the 'skill test' to decide whether an activity is gambling or not.
3. **Lake Turkana**, the world's largest desert lake, is part of the **Omo-Turkana basin**, which stretches into four countries: Ethiopia, Kenya, South Sudan and Uganda.

12TH DECEMBER

1. Heliophysics is the study of the **effects of the Sun on the Solar System**
2. India's initial national AI strategy, **#AIFORALL**, aimed at inclusivity, debuted in 2018
3. **Geographic Information System** is a technology that captures, manages, analyses, and presents geographical or spatial data. **Geotagging is the process of adding**

geographical identification to various media such as photos, videos, websites, or other documents.

13TH DECEMBER

1. The River Cities Alliance (RCA) is a joint initiative of the **Ministry of Jal Shakti (MoJS) & the Ministry of Housing and Urban Affairs (MoHUA)**, with a vision to connect river cities and focus on sustainable river centric development.
2. **Archaeological Survey of India (ASI) was founded in 1861 by Alexander Cunningham**—the first Director-General of ASI. Alexander Cunningham is also known as the “Father of Indian Archaeology”.
3. India documented 530 cases and four deaths from **Visceral leishmaniasis (Kala-Azar) in 2023**, a decline from previous years.

14TH DECEMBER

1. Lakshadweep has a whopping **100% reservations for Scheduled Tribes**
2. In the nascent days of the internet, **browsing was a text-based venture until Tim Berners-Lee introduced the World Wide Web in 1990**, alongside the inaugural web browser, 'WorldWideWeb'.
3. Anarcho-capitalism is a **political philosophy and political-economic theory that advocates the voluntary exchange of goods and services in a society broadly regulated by the market rather than by the state**. Anarcho-capitalists assert that private companies in a free market can efficiently provide policing and legal services.

15TH DECEMBER

1. According to a 2019 Greenpeace study, **India is the largest emitter of SO2 in the world**
2. India is the second largest producer of onion after China
3. The International Union for Conservation of Nature (IUCN) Red List has recently reclassified the **status of the Saiga Antelope (Saiga tatarica) from Critically Endangered to Near Threatened**.

16TH DECEMBER

1. According to the National Crime Records Bureau (NCRB), **India identified over 6,500 human trafficking victims in 2022**, with 60% of them being women and girls

2. The all-India average blending of ethanol with petrol has risen from 1.6% in 2013-14 to 11.8% in 2022-23.
3. **Directorate General of Trade Remedies (DGTR) under Ministry of Commerce & Industry, is the single national authority for administering all trade remedial measures** including anti-dumping, countervailing duties and safeguard measures.

18TH DECEMBER

1. As per the survey carried out by the National Sample Survey Organization in the year 2011-12, the total employment in both organized and unorganized sectors in the country was of the order of 47 crore. Out of this, about 39 crore are in the unorganized sector.
2. There's been a 18% increase in Opium cultivation in Myanmar, reaching 47,100 hectares. This surge has made **Myanmar the world's largest source of opium**, particularly due to disruptions following the Military Takeover in 2021.
3. **India was one of the first in Asia to recognize the effectiveness of the Export Processing Zone model in promoting exports**, with Asia's first EPZ set up in Kandla, Gujarat in 1965.

19TH DECEMBER

1. In India, the possession of e-cigarettes and similar devices is a violation of the Prohibition of Electronic Cigarette Act (PECA) 2019.
2. Recently, the **Advocates Amendment Bill, 2023**, was passed in the Lok Sabha and Rajya Sabha. Its purpose was to weed out 'touts' from the legal system.
3. Established in 1975 through the Lagos Treaty, the **ECOWAS (CEDEAO in French) is a regional intergovernmental organization promoting economic integration** and cooperation among West African nations. It is headquartered in Abuja, Nigeria.

20TH DECEMBER

1. The Logistics Performance Index (LPI), developed by the **World Bank Group**, is an interactive benchmarking tool created **to help countries identify the challenges and opportunities they face in their performance on trade logistics** and what they can do to improve their performance. **India ranked 38th out of 139 countries in LPI 2023.**

2. Recently, a seven-judge Constitution Bench of the Supreme Court (SC) held that arbitration agreements embedded in unstamped or insufficiently-stamped substantive commercial contracts or instruments are not invalid, unenforceable or even non-existent.
3. The United Nations Convention against Corruption (UNCAC) is the **only legally binding multilateral international anti-corruption treaty.**

21ST DECEMBER

1. **China, India, and Indonesia, the three largest coal producers globally**, are expected to break output records in 2023, pushing global production to a new high in 2023. **These three countries now account for more than 70% of the world's coal production**
2. The **Volkswagen scandal**, in which the German car company was found to have been cheating in emission testing of its supposedly green diesel vehicles, was a case of **greenwashing**.
3. The idea of the **Social stock exchanges (SSEs) as a platform for listing social enterprise, voluntary and welfare organizations** so that they can raise capital was mooted in the Union Budget 2019-20. **It works under the market regulator Security and Exchange Board of India (SEBI).**

22ND DECEMBER

1. NTDs (Neglected Tropical Diseases) affect more than a billion people globally. They are **preventable and treatable**. There are 20 NTDs that impact over 1.7 billion people worldwide.
2. Disproportionate assets is a term used in India to **describe an individual's net economic assets that significantly exceed the assets they should possess**. This is after accounting for the assets they previously held and all legal sources of income.
3. An AIF (Alternative Investment Fund) refers to a **fund established or formed in India, serving as a privately pooled investment mechanism**. As of December, 2023, **1,220 AIFs were registered with the Securities and Exchange Board of India (SEBI).**

23RD DECEMBER

1. Rudra is an **indigenous server platform built by the C-DAC** which has two expansion slots for graphic cards. **Param Utkarsh is a high-performance computing system setup at C-DAC** that offers AI over machine learning and deep

learning frameworks, computing and storage as a cloud service.

2. On average, **22 CAG reports were tabled in Parliament each year between 2019 and 2023**, compared to the 40 reports tabled between 2014 and 2018
3. **Mithila Makhana or Makhan (botanical name: Euryale ferox Salisb.)** is a special variety of aquatic foxnut cultivated in Mithila region of Bihar and Nepal. It is also **recognised with the GI (geographical indication) tag.**

25TH DECEMBER

1. Recently introduced, the **Post Office Bill, 2023 aims to repeal the Indian Post Office Act, 1898**, which has been in existence for 125 years. The **Act regulates India Post**, a departmental undertaking of the central government.
2. Nearly 267 million adults (15 years and above) in India (29% of all adults) are users of tobacco, according to the Global Adult Tobacco Survey India, 2016-17
3. The R21/Matrix-M vaccine became the **second malaria vaccine to achieve WHO prequalification**, the first one was the RTS, S/AS01 vaccine.

26TH DECEMBER

1. **Iceland is home to 33 active volcanoes**, the highest in Europe. This unique landscape has **given Iceland the epithet, 'Land of Fire and Ice'.**
2. The Rare Earth (RE) resources in India are reported to be the **fifth largest in the world**
3. The **longest river in Bhutan is the Manas River.** The Manas River is a transboundary river in the Himalayan foothills between southern Bhutan and India.

27TH DECEMBER

1. The Sone River, a perennial river in central India, is the **Ganges' 2nd-largest southern tributary.**
2. The Ministry of Heavy Industries is implementing the **FAME India Phase-II scheme for five years**, starting April 1, 2019, with a total budget of Rs. 10,000 crore.
3. India has a 60%-73% demand-supply gap in key roles such as **ML engineer, data scientist,**

DevOps engineer, and data architect.

28TH DECEMBER

1. Girl child marriages declined from 49% in 1993 to 22% in 2021
2. While rudimentary sanitation was introduced by ancient civilisations around 4000 BC, the **modern sanitation system was built in London** around the 1800s
3. The **Strait of Hormuz is situated between Qeshm Island** and the Iranian coast in the north and the Musandam Peninsula of the Arabian Peninsula in the south.

29TH DECEMBER

1. Roughly **68% of the universe is dark energy and dark matter makes up about 27%.** The rest of everything on Earth, everything ever observed with all of our instruments, all normal matter adds up to less than 5% of the universe
2. **Cyber risks are cited as the biggest threat faced by Indian organizations**, with 38% of respondents feeling highly or extremely exposed to it.
3. Biofertilizer can be defined as **biological products containing living microorganisms that, when applied to seed, plant surfaces, or soil, promote growth** by several mechanisms such as increasing the supply of nutrients, increasing root biomass or root area and increasing nutrient uptake capacity of the plant.

30TH DECEMBER

1. In 2021, **non-profit Pesticide Action Network (PAN) International released a list of highly hazardous pesticides**, of which over 100 pesticides are currently approved for use in India
2. India has close to 50-100 million people affected by rare diseases or disorders.
3. The **Indian Meteorological Department (IMD)** recently got a new logo ahead of the commencement of its 150th year of providing weather and climate services to the country. **IMD was established in 1875.**

Practice MCQs on Current Affairs Subject- December 2023

1. Consider the following statements, with reference to Pressmud:

1. Pressmud is the residue of the filtration of sugarcane juice.
2. It is often known as filter cake or press cake.
3. It eliminates pre-treatment costs as it lacks the organic polymer lignin.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: Pressmud is a residual by-product in the sugar industry often known as filter cake or press cake. The by-product can help Indian sugar mills generate extra revenue by utilising it as a feedstock for biogas production through anaerobic digestion and subsequent purification to create compressed biogas (CBG).

Advantages:

1. It eliminates the complexities associated with the feedstock supply chain, unlike agricultural residue.
2. It is sourced from one or two producers or sugar mills, as opposed to agricultural residue, which involves multiple producers / farmers within a narrow window of 45 days per year.
3. It is an organic material which can minimize anaerobic digesters, leading to lower gas output.
4. It eliminates pre-treatment costs as it lacks the organic polymer lignin, unlike agriresidue.
5. It has higher conversion efficiency than the agriculture residue.
6. It can help generate 460,000 tonnes of compressed biogas CBG valued at Rs 2,484 crore.

Disadvantages:

1. High demand leading to surge in the prices.
2. The lack of long-term agreements with sugar mills and the involvement of mediators in procurement further compound the challenges.
3. Lack of CBG plants to store feedstock for the entire year, since sugar mills operate for a specific period.
4. Storing pressmud proves challenging as it undergoes gradual decomposition, resulting in the breakdown of organic compounds which complicates long-term storage and raises production costs. Hence, all statements are correct.

2. 3HP, recently seen in the news, is related to which of the following?

- (a) A newly found music butterfly species in the Manas National Park of Assam.
- (b) An online database that maps old coal-fired units and new proposals since 2010.
- (c) Indigenously developed India's 1st safe vero-cell rabies vaccine.
- (d) A short-course Tuberculosis Preventive Treatment (TPT) regimen, endorsed by the WHO.

Answer: (D)

Explanation: Recently the Tamil Nadu and Kerala have begun using 3HP for TB preventive treatment even though the states are yet to receive the drugs from the Central TB Division. **3HP is a short-course Tuberculosis Preventive Treatment (TPT) regimen which is endorsed by the WHO.** It combines high dose Isoniazid (H) and high dose rifapentine (P) once weekly for 3 months. **3HP is associated with significantly lower hepatotoxicity and higher rates of treatment completion than isoniazid preventive treatment.** While 3HP is expensive in the short-term, the shorter duration of treatment and higher rates of treatment completion make it more cost-effective in the long-term. **Children of age 2 and above can take 3HP.** All household contacts of a person who has been recently diagnosed with pulmonary TB are tested for TB disease and those who do not have TB disease but have been infected with the bacteria are offered treatment to prevent the progression from latent infection to TB disease. **It is offered for all household contacts of a person who have following criteria:** Persons recently diagnosed with pulmonary TB are tested for TB disease. People who do not have TB disease but have been infected with the bacteria. It is offered treatment to prevent the progression from latent infection to TB disease. Since treatment with 3HP involves only 12 doses, compliance is better, adverse effects of the drugs are less and treatment completion is better compared with others. The 3HP regimen has been associated with a higher completion rate in all subgroups where adults with HIV, adults without HIV, and children and adolescents. **TPT using the 3HP drug is cheaper than isoniazid monotherapy for six months. Hence, statement (d) is correct.**

3. Consider the following statements, with reference to Green leaf volatiles:

1. They are part of a plant's defense mechanism against herbivores and pathogens.
2. GLVs can attract or repel insects.
3. They are primarily composed of six-carbon aldehydes, alcohols, and esters.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two

- (c) All three
(d) None

Answer: (C)

Explanation: GLVs are **part of a plant's defense mechanism against herbivores and pathogens**. When a plant is damaged, enzymes break down fatty acids in cell membranes, releasing GLVs that signal nearby plants to prepare for potential threats. GLVs can attract or repel insects. For instance, they might lure predators of herbivores or serve as warning signals to neighboring plants.

Aldehydes: These include compounds such as **hexenal and hexanal**, which contribute to the characteristic fresh, grassy scent.

Alcohols: Compounds like hexenol and hexanol are often associated with floral aromas and contribute to the overall volatile profile.

Esters: These compounds, such as hexyl acetate, can have fruity or sweet aromas and are crucial for plant signaling and defense mechanisms. Hence, all statements are correct.

4. Consider the following statements:

Statement 1 – The concept of "frame-dragging" or the Lense-Thirring effect is associated with the distortion of spacetime due to a rotating massive object.

Statement 2 – Frame-dragging occurs because the rotation of a massive object causes a dragging effect on the surrounding spacetime, affecting nearby objects' orbits.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement II is the correct explanation for Statement-I
(b) Both Statement-I and Statement-II are correct and Statement II is not the correct explanation for Statement-I
(c) Statement-I is correct but statement II is incorrect
(d) Statement -I is incorrect but Statement -II is correct

Answer: (A)

Explanation: Frame-dragging, also known as the **Lense-Thirring effect**, is a consequence of Einstein's general theory of relativity. According to this concept, a **rotating massive object drags and twists the fabric of spacetime around it**. This dragging effect influences the motion of nearby objects, causing their orbits to precess or change due to the distortion of spacetime caused by the rotating mass.

5. Consider the following statements, with reference to Parthenon Sculptures:

1. They are a collection of different types of marble architectural decoration.
2. They are from the temple of Athena on the Acropolis in Athens, Greece.

Which of the above statements is/are correct?

- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (C)

Explanation: Recently a diplomatic row sparked between Greece and the UK on Monday after British Prime Minister cancelled a meeting with his Greek counterpart over the status of the Parthenon Sculptures. **The Parthenon Sculptures are a collection of different types of marble architectural decoration from the temple of Athena (the Parthenon) on the Acropolis in Athens.** It is made between 447BC and 432BC which is more than 2,000 years old. Most of them originally adorned the walls and grounds of the Parthenon temple on the rocky Acropolis hill in Athens.

The Parthenon Sculptures consist of:

1. A frieze which shows the **procession of the Panathenaic festival** (the commemoration of the birthday of the goddess Athena);
2. A series of metopes (sculpted relief panels) depicting the battle between Centaurs and Lapiths at the marriage-feast of Peirithoos; and
3. Figures of the gods and legendary heroes from the temple's pediments.

The British Museum houses 15 metopes, 17 pedimental figures and 247ft (75m) of the original frieze. **More than 50% of the original sculptures is housed at British Museum, London and half in Athens** They were removed from the Parthenon in the early 19th century by Thomas Bruce, the 7th Earl of Elgin and then-British ambassador to the Ottoman Empire. The marbles were taken to Britain and purchased by the British Museum in 1816. Athens has been demanding the return of the sculptures since it became independent in the early 1830s. **The campaign gained momentum in the 1980s after Greek Oscar-nominated actress Melina Mercouri launched a movement for their return when she was culture minister between 1981 and 1989.** The British Museum, the caretaker of the sculptures, claims that they were acquired by Elgin under a legal contract with the Ottoman Empire and has rejected the demands of their return. **Hence, both statements are correct.**

6. Consider the following statements, with reference to Golden Gate Declaration:

1. It is a declaration by the G20 Economic Leadership forum.
2. The declaration aims to create a Resilient and Sustainable AI for G20 nations.
3. Putrajaya Vision 2040 is part of the declaration that aims for an open, dynamic, resilient and peaceful Asia-Pacific community by 2040.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (D)

Explanation: The 30th edition of Asia-Pacific Economic Cooperation (APEC) Economic Leaders' Meeting concluded in San Francisco with the adoption of the Golden Gate Declaration. The declaration underscores the commitment to creating a resilient and sustainable future for all member economies. **The declaration aims to create a Resilient and Sustainable future for all. The summit concluded with the leaders declaring a commitment "to deliver a free, open, fair, non-discriminatory, transparent, inclusive, and predictable trade and investment environment.** APEC is committed to necessary reform of the WTO to improve all of its functions, including conducting discussions with a view to having a fully and well-functioning dispute settlement system accessible to all members by 2024. During the forum meeting most APEC members strongly condemn aggression against Ukraine. The effective policies require, above all, responsiveness to all our people and economies. **APEC mission and their practical work remain guided by their commitment, as laid out in the Putrajaya Vision 2040 and the Aotearoa Plan of Action.** Putrajaya Vision 2040 and Aotearoa Plan of Action is an open, dynamic, resilient, and peaceful Asia-Pacific community by 2040, for the prosperity of all our people and future generations. Hence, all statements are not correct.

7. Consider the following statements, with reference to Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN):

The scheme aims to provide pucca houses, piped water supply and roads for PVGT.
2. It focuses on 11 critical interventions through 9 ministries, including the Ministry of Tribal Affairs.
3. The Ministry of Tribal Affairs will set up Ayush Wellness Centre and Ayush facilities will be extended to PVTG habitations through mobile medical units.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: The PM-JANMAN will focus on 11 critical interventions through nine ministries, including the Ministry of Tribal Affairs. It aids to ensure last-mile welfare scheme delivery. **75 communities located in 18 states and the Union Territory of Andaman and Nicobar Islands have been categorised as Particularly**

Vulnerable Tribal Groups (PVTGs). The scheme aims to provide pucca houses, piped water supply and roads for PVGT. The basic facilities include Road and telecom connectivity, electricity, safe housing, clean drinking water and sanitation, improved access to education, health and nutrition and sustainable livelihood opportunities. **The Ministry of Ayush will set up Ayush Wellness Centre as per existing norms and Ayush facilities will be extended to PVTG habitations through mobile medical units.** The Ministry of Skill Development and Entrepreneurship will facilitate skill and vocational training in PVTG habitations, multi-purpose centres and hostels as per suitable skills of these communities. Hence, statement 3 is not correct.

8. Consider the following pairs:

Tribal community	Origin state
1. Soliga	Karnataka
2. Betta Kurumba	Andhra Pradesh
3. Paniyan	Madhya Pradesh

How many of the pairs given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Recently, **Lantana jumbos (statute) was placed at the legislative assembly of Karnataka and Craftsmen from Soliga, Betta Kurumba and Paniyan tribal communities** are known for carving elephants and other animals using lantana logs. **Soligas –** are the major indigenous tribes of BR Hills situated in **Chamarajanagar district of Karnataka.** Soligas have led a semi-nomadic life and were engaged in shifting cultivation. **Betta Kurumba –** are one of several ethnic groups who live in the **Nilgiri-Wynaad region of region of southern India.** Their home range straddles the states of Karnataka, Kerala, and Tamil Nadu. **Paniyan –** Wayanad of Kerala holds the largest population the Paniya tribe, also known as Paniyar/Paniyan. They are found in Wayanad, Kannur, Kozhikode and Malappuram districts of Kerala and adjoining districts of Coorg in Karnataka and the Nilgiris in Tamil Nadu. **The term Paniya essentially means 'someone who does work' or 'labourer'. Hence, only pair 1 is correctly matched.**

9. Consider the following statements regarding Hammer Candlesticks in Trading:

1. It happens when a security trades much higher than its initial price but rises within a short amount of time to close near the opening price.

2. It could be utilized as an early intraday indication to indicate a shift in a bullish/bearish trend.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: When looking at price movement, it is one of the most popular candlestick patterns traders employ to measure the probability of outcomes. In candlestick charting, a hammer is a price pattern that happens when a security trades much lower than its opening but rises during the period to close near the opening price. Hence, statement 1 is not correct. The hammer candlestick occurs when sellers enter the market during a price decline. By the time the market closes, buyers absorb selling pressure and push the market price near the opening price. The close can be above or below the opening price, although the close should be near the open for the real body of the candlestick to remain small. Analysts view it as a potential bullish trend reversal indicator, mainly appearing at the end of a downtrend. It could be used as a leading intraday indicator to signal a change in bullish/bearish momentum. Hence, statement 2 is correct.

10. Consider the following statements, with reference to the 14th National Electricity Plan (NEP14) for India:

- 1. The plan is prepared by the Central Electricity Authority (CEA).
- 2. The plan aims to triple the India's renewable energy capacity by 2050.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: According to a recent report by a think tank, India will need additional investment of \$101 billion to align with International Energy Agency's (IEA) Net Zero target, compared to the 14th National Electricity Plan. National Electricity Plan is prepared by the Central Electricity Authority (CEA) in accordance with the National Electricity Policy and notify such plan once in 5 years. Hence, statement 1 is correct.

The country requires an investment of \$293 billion between 2023 and 2030 to meet the NEP14 solar and wind capacity targets, including storage and transmission. The plan aims to triple the India's renewable energy capacity by 2030. Hence, statement

2 is not correct.

Key highlights of NEP14 –

- It sets out solar capacity targets of 185.6 GW by FY 2026-27, reaching 364.6 GW by FY 2031-32.
- To achieve these targets, India needs to increase its current annual solar capacity addition by about 36% each year leading up to 2026-27.
- It estimates India's total annual electricity generation to grow by 1,174 Terawatt hours (TWh) in FY 2022-32 period, reaching a total of 2,666 Terawatt hours (TWh) in FY 2032.
- Solar generation is expected to rise from 73 TWh in FY 2022 to 666 TWh in FY 2032. Wind power will increase from 69 TWh to 258 TWh in the same time period.
- Annual solar and wind generation are expected to rise which combined constitute 66% of India's power generation growth in this 10-year period.
- If India achieves its solar targets set out in NEP14, solar's share in the nation's power mix is expected to increase five-fold from 5% in FY 2022 to 25% in FY 2032.

11. Consider the following statements regarding Exit Polls:

- 1. It is conducted after the completion of the voting process.
- 2. Only State run media is permitted to conduct Exit Polls.
- 3. The Election Commission has no powers with respect to Exit Polls.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Recently the exit polls were conducted in the 5 states such as Telangana, Madhya Pradesh, Rajasthan, Mizoram, and Chhattisgarh for the state assembly elections. An opinion poll is a pre-election survey to gather voters' views on a range of election-related issues. An exit poll is a post-election survey that is conducted immediately after people have voted and assesses the support for political parties and their candidates. It is conducted by various survey agencies. The first exit poll in India was conducted in 1957 during the second Lok Sabha elections by the Indian Institute of Public Opinion. Exit poll results are very useful to the media to fill a bit of airtime before the announcement of the results. A well-run exit poll can be extremely accurate. In February 2010, restrictions were imposed only on exit polls through the introduction of Section 126(A) in the RPA. Election Commission has powers to regulate Exit Polls. Hence, statement 2 and 3 are not correct.

12. Consider the following statements, with reference to Piezoelectricity:

1. It is the process of using crystals to convert mechanical energy into electrical energy or vice versa.
2. Bone and tendons have the capacity to support Piezoelectricity.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Piezoelectricity was discovered in 1880 by Pierre and Paul-Jacques Curie. Piezoelectricity is a phenomenon in which certain materials can generate an electric charge in response to mechanical stress. **The certain materials include quartz, ceramics such as lead zirconate titanate (PZT) and even certain biological substances like bone and the tendons.** Usually, the charges on atoms in the molecules that make them up are symmetric on two sides of an axis. But in certain materials when some stress is applied, the molecule becomes distorted and the asymmetry of charges gives rise to a small electric current. Some materials also display an inverse piezoelectric effect, where the application of an electric current induces a mechanical deformation. **A piezoelectric crystal is placed between two metal plates.** At this point, the material is in perfect balance and does not conduct an electric current. Mechanical pressure is then applied to the material by the metal plates, which forces the electric charges within the crystal out of balance. Excess negative and positive charges appear on opposite sides of the crystal face. The metal plate collects these charges, which can be used to produce a voltage and send an electrical current through a circuit. Both direct and inverse piezoelectric materials are widely used in pressure sensors, accelerometers, and acoustic devices, where their ability to convert mechanical signals into electrical signals is crucial. The piezoelectric effect is also what made quartz watches so common and over time, affordable. **Hence, both statements are correct.**

13. Orbital Resonance, sometimes seen in the news, is related to which of the following statements?

- (a) A phenomenon that occurs when an object or system is subjected to an external force or vibration that matches its natural frequency.
- (b) It is any system of two or more satellites orbiting the same primary and whose orbital mean motions are in a ratio of small whole numbers.
- (c) A way of describing the bonding in certain molecules and polyatomic ions.
- (d) It is the time it takes for an object to return to the same point in its orbit.

Answer: (B)

Explanation: Orbital Resonance is any system of two or more satellites (including planets) orbiting the same primary and whose orbital mean motions are in a ratio of small whole numbers.

Astronomers have discovered an exceptionally rare phenomenon in a nearby star system where 6 planets that orbit their central star in sync with a rhythm. **The six planets orbit a star called HD110067, which is about 100 light-years away from the Earth in the northern constellation of Coma Berenices.** In this particular case, the planet closest to the star makes three orbits for every two of the next planet. This is called a 3/2 resonance and is repeated among the four closest planets. Multi-planet systems may be common in our galaxy, but ones in a tight gravitational formation known as "resonance" are rarely observed. Among the two outermost ones, a 4/3 resonance pattern was identified, meaning that one takes four orbits for every three of the outermost one. **Hence, statement (b) is correct.**

14. Consider the following passage:

It is a medieval fort located on the Arabian Sea off the coast of Maharashtra in western India. Chhatrapati Shivaji Maharaj of the Maratha Empire erected the fort. It covers 48 acres and has reinforced walls that are 29 feet high and 12 feet thick, stretching over two miles. A slab within the fort bears the Maratha King's handprint and footprint.

The above-mentioned passage refers to which one of the following forts?

- (a) Pratapgarh Fort
- (b) Sindhudurg Fort
- (c) Rajgarh Fort
- (d) Barabati Fort

Answer: (B)

Explanation: The Indian Navy is arranging a huge 'Operational Demonstration' on Navy Day at Sindhudurg Fort in Maharashtra to demonstrate its operational capabilities. It is a medieval fort located on the Arabian Sea off the coast of Maharashtra in western India. **The stronghold is located on Kurte Island, along the shore of Malvan town in Sindhudurg District in Maharashtra's Konkan area, 450 miles south of Mumbai.** The Maratha Empire's Chhatrapati Shivaji Maharaj built the fort. The construction of the fort began in 1664 and took three years to complete. It is spread over 48 acres with fortified walls that are 29 feet high and 12 feet thick and stretch for two miles. **One can enter the fort through the Dilli Darwaja, the main gate.** Because of its architectural design, the gate is visible only from close quarters and seems to be part of the walls. It is surrounded by several smaller forts, such as Padmagad, Rajkot, and Sarjekot Forts. A handprint and footprint of the Maratha King are embedded on a slab

within the fort. A **small temple dedicated to the Chhatrapati also finds a place within the bounds of the fort. Hence, option (b) is correct.**

15. Consider the following statements regarding 'Gajraj Suraksha' technology:

1. It is introduced by the Ministry of Environment, Forest and Climate Change of India with the support of the Wildlife Trust of India.
2. It uses an AI-based algorithm and a network of sensitive optical fiber cables to detect elephants getting close to railway tracks.
3. It aims to address the issue of elephant fatalities resulting from train accidents.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Indian Railways has introduced a cutting-edge technology named 'Gajraj' to prevent elephant accidents on railway tracks. **Hence, statement 1 is not correct.**

It uses an AI-based algorithm and a network of sensitive optical fibre cables to detect elephants getting close to railway tracks. Hence, statement 2 is correct.

It aims to address the issue of elephant fatalities resulting from train accidents. Hence, statement 3 is correct.

Gajraj Suraksha senses pressure waves generated by the movement of elephants along the tracks. As elephants move, the optical fibres detect vibrations caused by their footsteps. **These vibrations trigger signals within the optical fibre network, enabling the system to identify the presence of elephants up to 200 metres ahead of their arrival on the track.** The OFC-based Intrusion Detection System works by sending alarms to station masters whenever movement is detected along the tracks. The network is designed in such a way that it can track the movement of the elephant with great accuracy and report it to nearby station masters. This allows them to promptly inform locomotive drivers in the affected areas. This quick communication ensures that trains can be slowed down or stopped, preventing potential collisions with elephants. **Indian Railway is planning to introduce this system in West Bengal, Odisha, Jharkhand, Assam, Kerala, certain parts of Chhattisgarh, and Tamil Nadu.**

16. Consider the following statements, with reference to LHS 3154 Star:

1. LHS 3154 is an ultra-cool dwarf star that's about 50 light years away from Earth.
2. It is about a thousand times less luminous than our

sun and nine times less massive.
3. The planet, LHS 3154b, is 13 times more massive than Earth and about the mass of Neptune.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: LHS 3154 is an **ultra-cool dwarf star that's about 50 light years away from Earth.** It is about a thousand times less luminous than our sun and nine times less massive. **The planet, LHS 3154b, is 13 times more massive than Earth and about the mass of Neptune. It is classified as an M dwarf,** which is the least massive spectral type of star. In early 2020, astronomers observed a periodic shift in LHS 3154's spectrum every 3.7 days. This indicated that the star was being wobbled by the gravitational pull of a planet in a close orbit. LHS 3154 has a planet called LHS 3154 b that orbits it. **Hence, all statements are correct.**

17. Consider the following statements, with reference to Akkadi Saalu:

1. Akkadi Saalu is an intercropping system that has been in traditional practice in Karnataka.
2. It is a biodiversity based ecological farming practice with zero chemical fertilisers, zero chemical pesticides and minimal use of ground water.
3. It involves intercropping with a combination of legumes, pulses, oilseeds, trees, shrubs and livestock that improves the health of the soil.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: The recently released report by the FAO suggests that use of traditional farming practices including Akkadi Saalu could reduce the escalating human and environmental costs of producing food. **Akkadi Saalu is an intercropping system that has been in traditional practice in Karnataka.** It is diversity based ecological farming practice that integrates multi-cropping with livestock, native seeds, soil enrichment, organic fertilizers and bio-markers as indicators of crop health. It helps to preserve life in the soil by reducing the use of pesticides. **It is a traditional, biodiversity based ecological farming practice with zero chemical fertilisers, zero chemical pesticides and minimal use of ground water. It involves intercropping with a combination of legumes, pulses, oilseeds, trees, shrubs and livestock that improves the health of the soil.** It is

built on proven ecological principles integrated into locally adopted farming systems and innovations like BioChar. Akkadi Saalu helps farmers make the best use of land which depends on rains. **Hence, statement 1 is not correct.**

18. With reference to Endothelial Cells, consider the following statements:

1. Endothelial cells are thin, wafer-like cells that line the inside of all blood vessels in the body.
2. They form a double cell-thick layer called the endothelium.
3. They are the secondary cell type that comes into contact with blood.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Recently, the scientists have discovered a molecular mechanism that reins in the overgrowth of blood vessels by regulating endothelial cell size and the mTORC1 signaling pathway. **Endothelial cells are thin, wafer-like cells that line the inside of all blood vessels in the body.** They form a single cell-thick layer called the endothelium. They are the primary cell type that comes into contact with blood. They also organize the growth and development of connective tissue cells that form the surrounding layers of the blood-vessel wall. **Hence, only statement 1 is correct.**

19. Consider the following statements regarding Cholelithiasis:

1. It is a disorder characterised by gallbladder stones.
2. It is most usually caused by a chemical imbalance inside the gallbladder's contents.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: A new study offers light on the complicated relationship between serum lipids, lipid-modifying targets, and cholelithiasis. **Cholelithiasis is the medical term for gallstones.** It is a prevalent hepatobiliary disorder that primarily affects Western people. It is a **significant risk factor for cholangiocarcinoma**, a kind of bile duct cancer. **Gallstones are hardened digestive fluid deposits that occur in the gallbladder.** The gallbladder is a tiny, pear-shaped organ located under the liver that stores bile produced by the liver. **Bile is a digestive fluid composed of cholesterol, bile salts, and**

bilirubin that enters the small intestine via the cystic and common bile ducts to aid in fat digestion.

Cholelithiasis is most usually caused by a chemical imbalance inside the gallbladder's contents, in which the bile includes too much cholesterol or bilirubin. Abdominal pain in the upper right or central abdomen is the most typical sign of cholelithiasis. Treatment options include medicines and surgical procedures. **Hence, both statements are correct.**

20. It is situated in Southeast Asia and is bordered on the north and north-east by China, on the east and south-east by Laos and Thailand, on the south by the Andaman Sea and the Bay of Bengal and on the west by Bangladesh and India.

Above paragraph described about which of the following country?

- (a) Cambodia
- (b) North Korea
- (c) Brunei
- (d) Myanmar

Answer: (D)

Explanation: Myanmar, formerly known as Burma, is a Southeast Asian nation bordered by India, Bangladesh, China, Laos and Thailand. It is a country of great ethnic diversity, with over 135 distinct ethnic groups. **The majority of the population is Buddhist, but there are also significant Christian, Muslim and Hindu minorities.** Recently, in the eastern city of Loikaw in Myanmar, pro-democracy fighters navigated through the streets in a worn-out pickup truck.

21. With reference to Climate Club, consider the following statements:

1. The Climate Club is an intergovernmental forum that aims to mitigate climate change by reducing carbon emissions.
2. It was first proposed by Brazil during a G7 summit meeting in 2022.
3. Climate Club is a group of 36 nations in which India is included.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Recently, the Climate Club has been launched during COP28 summit and co-led by Germany and Chile. The Climate Club is an intergovernmental forum that aims to mitigate climate change by reducing carbon emissions. **The concept of a climate club was developed by Yale economist William Nordhaus in 2015. It was first proposed by Germany during a G7 summit meeting in 2022.** The G7 is a group of developed

nations (the US, the UK, Canada, France, Germany, Italy and Japan) that gets together every year to discuss global challenges. So far, **Climate Club is a group of 36 nations in which India is not included. Hence, only statement 1 is correct.**

22. Consider the following passage:

It is an active stratovolcano located on the border between the province of Central Java and the Special Region of Yogyakarta, Indonesia. The volcano is also known as the "Mountain of Fire" in the Javanese language. It is the most active volcano in Indonesia and has erupted regularly since 1548.

The above passage is related to which of the following volcano mount?

- (a) Mount Agung
- (b) Mount Rinjani
- (c) Mount Merapi
- (d) Mount Semeru

Answer: (C)

Explanation: Recently, **Mount Marapi volcano in Indonesia has erupted furiously, leading to a tragic aftermath. Mount Merapi is a stratovolcano in Indonesia.** It is located on the border of the Central Java and Yogyakarta provinces. **The volcano is also known as the "Mountain of Fire" in the Javanese language.** It is the most active volcano in Indonesia and has erupted regularly since 1548. **Indonesia is located on the Pacific Ring of Fire, which is a path along the Pacific Ocean with frequent earthquakes and active volcanoes.** The Ring of Fire is a horseshoe-shaped region around the Pacific Ocean that is known for its high seismic and volcanic activity. **It is also called the Circum-Pacific Belt or Circum-Pacific Seismic Belt.** The Ring of Fire is caused by the subduction of oceanic and continental plates. This subduction is a very slow process, moving just one or two inches per year. **Some important places located in the Ring of Fire including Bolivia, Chile, Ecuador, Peru, Costa Rica, Guatemala, Mexico, United States, Canada and Russia. Hence, option (c) is correct.**

23. With reference to White Hydrogen, consider the following statements:

1. It is a potential clean energy source naturally produced in the Earth's crust.
2. White hydrogen causes no CO₂ emissions when used as a fuel.
3. White hydrogen is cheaper than the cheapest hydrogen from fossil fuels and cheapest green hydrogen.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: Recently, scientists found a huge stash of white hydrogen near the French-German border. White hydrogen is a naturally occurring gas found in the Earth's crust. **It is also known as "natural," "gold," or "geologic" hydrogen. It is considered a potential clean energy source.** It only produces water when it is burned. **White hydrogen is 33% cheaper than the cheapest hydrogen from fossil fuels and 2 times cheaper than the cheapest green hydrogen.** The deposit could contain between 6 million and 250 million metric tons of hydrogen. Scientists Jacques Pironon and Philippe De Donato initiated a mission in northeastern France to assess methane levels in the subsoils of the Lorraine mining basin. The discovery and potential utilization of white hydrogen have a significant role in addressing the climate crisis. **Hence, all statements are correct.**

24. With reference to Cyclone Michaung, consider the following statements:

1. It is an extra-tropical cyclone that is tracking northwest in the western Bay of Bengal.
2. 'Michaung' is named after a suggestion provided by Bangladesh which means strength and resilience.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (D)

Explanation: **Cyclone Michaung is a tropical cyclone** that is tracking northwest in the western Bay of Bengal. 'Michaung' is named after a suggestion provided by Myanmar. It means strength and resilience. **The National Crisis Management Committee (NMC) recently convened to assess the readiness of State governments and Central Ministries for the approaching cyclone 'Michaung' in the Bay of Bengal.** The India Meteorological Department (IMD) reported the storm's current location and projected path, indicating potential landfall on coastal Andhra Pradesh. The NMC is a committee set up to coordinate and implement relief measures and operations in the wake of a natural calamity. The NMC coordinates and oversees the response to major crises, emergencies, and disasters that may affect India. **NMC is headed by the Cabinet Secretary. Hence, both statements are not correct.**

25. Consider the following statements regarding White Lung Syndrome:

1. White Lung Syndrome is identified through distinctive white patches observed on chest X-rays among affected children.
2. The syndrome is believed to arise from a combination

of bacterial and viral factors excluding environmental factors.

3. This term encompasses various respiratory illnesses such as acute respiratory distress syndrome (ARDS), pulmonary alveolar microlithiasis (PAM) and silica-related conditions.

Which of the above statements is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 3 only
- (d) 1, 2 and 3

Answer: (B)

Explanation: Recently, a respiratory illness named the **White Lung Syndrome emerged in northern China and Ohio, USA, sparking concerns akin to those of a potential post-COVID-19 pandemic threat.** White Lung Syndrome is identified through distinctive white patches observed on chest X-rays among affected children. This term encompasses various respiratory illnesses such as acute respiratory distress syndrome (ARDS), pulmonary alveolar microlithiasis (PAM) and silica-related conditions. **The syndrome is believed to arise from a combination of bacterial, viral and environmental factors.** Patients typically exhibit symptoms like cough, fever, runny nose, sinus congestion, difficulty breathing and fatigue. Treatment primarily targets managing pneumonia symptoms and ensuring optimal respiratory health. **Hence, statement 2 is not correct.**

26. With reference to National Organ and Tissue Transplant Organisation (NOTTO), consider the following statements:

1. It is a national level organization set up under Directorate General of Health Services, Ministry of Health and Family Welfare.
2. The National Organ and Tissue Transplant Organization (NOTTO) is a center for coordination and networking for the procurement and distribution of organs and tissues.
3. It is primarily focused on importing organs and tissues from other countries to meet domestic demand.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Recently, the **National Organ and Tissue Transplantation Organisation (NOTTO) have initiated an inquiry into allegations of a cash-for-kidney scam against Indraprastha Apollo Hospital.** The National Organ and Tissue Transplant Organization (NOTTO) is a center for coordination and networking for the procurement and distribution of organs and tissues. It

was launched in 2014. **It is under Directorate General of Health Services, Ministry of Health and Family Welfare, located in New Delhi.** It also registers organ and tissue donations and transplantations in India. **It's main objective is to fill the gap between demand and supply, and to ensure the quality of various tissues.** It handles the dissemination of information to all concerned organizations, hospitals and individuals. **It consists of two divisions: the National Human Organ and Tissue Removal and Storage Network and the National Biomaterial Centre.** NOTTO is not primarily focused on importing organs and tissues from other countries to meet domestic demand. **In fact, NOTTO has a number of initiatives in place to promote organ donation and transplantation within India.** For example, NOTTO has a national registry of potential organ donors, and it provides training and support to transplant centers across the country. **Hence, statement 3 is not correct.**

27. Consider the following statements regarding Global Goal on Adaption:

Statement-I: The Global Goal on Adaptation (GGA) is a collective commitment under the Paris Agreement to reduce vulnerability to climate change, strengthen resilience, and enhance adaptive capacity.

Statement-II: It was proposed by the G20 group members in 2013 and established in 2015.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Answer: (C)

Explanation: Recently at COP28 summit, developing countries opposed the draft of the Global Goal on Adaptation (GGA) due to perceived inadequacies. **The Global Goal on Adaptation (GGA) is a collective commitment under the Paris Agreement to reduce vulnerability to climate change, strengthen resilience, and enhance adaptive capacity. It was proposed by the African Group of Negotiators in 2013 and established in 2015.** Its objective is to enhance adaptive capacity, strengthen resilience and diminish vulnerability to the effects of climate change. **Hence, Statement-I is correct but Statement-II is incorrect.**

28. Consider the following passage:

It is one of the largest indigenous festivals organized by the State Tourism and Art & Culture Departments with support from the Union Government. It has been organized since 2000. The festival is also known as the

"Festival of Festivals". This festival is celebrated annually in the first week of December in Nagaland.

The above passage is related to which of the following festival?

- (a) Hornbill Festival
- (b) Losar Festival
- (c) Moatsu Mong Festival
- (d) Ambubachi Festival

Answer: (A)

Explanation: Recently, **24th edition of the Hornbill Festival commenced at Naga Heritage Village 'Kisama' in Nagaland.** The Hornbill Festival is a **10-day (December 1 to 10) celebration that takes place annually in the first week of December.** It has been organised since 2000. **The festival is also known as the "Festival of Festivals".** Germany, Columbia and USA are Country Partners and Assam is Partner state for this year's edition. **It is one of the largest indigenous festivals organized by the State Tourism and Art & Culture Departments** with support from the Union Government. The festival is named after the Indian hornbill, a bird that is often seen in Nagaland's forests and is significant in Naga folklore. **Hence, option (a) is correct.**

29. With reference to Cyber Surakshit Bharat Initiative, consider the following statements:

1. It was conceptualised with the mission to spread awareness about cybercrime and build the capacities of Chief Information Security Officers (CISOs) and frontline IT officials across all government departments.
2. It is an initiative of the Ministry of Electronics and Information Technology (MeitY), Government of India.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: It is an **initiative of the Ministry of Electronics and Information Technology (MeitY), Government of India.** It was conceptualised with the mission to spread awareness about cybercrime and build the capacities of Chief Information Security Officers (CISOs) and frontline IT officials across all government departments. **It is an initiative to fortify the cyber security system in India with regard to the Government's vision of a Digital India.** It was launched in cooperation with the National e-Governance Division (NeGD) and various industry partners in India. It can be entitled as the first public-private enterprise of its kind. The partners involved in the origination of this scheme include chief IT companies like Intel, Microsoft, etc. **The National e-Governance Division (NeGD) recently**

organised the 40th Chief Information Security Officers (CISOs) Deep-Dive training programme under the Cyber Surakshit Bharat Initiative. Hence, both statements are correct.

30. Consider the following statements regarding Aarogya Maitri Aid Cube, recently seen in news:

1. The World's first portable hospital, 'Aarogya Maitri Aid Cube' was unveiled in New Delhi.
2. It is designed indigenously under Project BHISHM (Bharat Health Initiative for Sahyog Hita and Maitri).
3. It is modular trauma management and aid system designed for rapid deployment in mass casualty incidents whether in times of peace and war.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: The World's first portable hospital, 'Aarogya Maitri Aid Cube' was unveiled in Gurugram. It is designed indigenously under Project BHISHM (Bharat Health Initiative for Sahyog Hita and Maitri), the modular trauma management and aid system is made up of 72 detachable mini-cubes, each being a specialized station for emergency response and humanitarian efforts. It contains medical equipment and supplies such as a mini-ICU, an operation theatre, cooking station, food, water, a power generator, blood test equipment, an X-ray machine, and more. The cubes are capable of handling patients with severe injuries up to 25 major burns, long limb fractures, chest injuries, spinal injuries and approximately 10 head injuries. It can treat as many as 200 patients. These cubes are light and portable, and can be rapidly deployed anywhere, from airdrops to ground transportation. **It consists of 72 cubes that can be combined to form a specialized cage capable of accommodating 36 mini-cubes.** The mini-cubes are packed with everything essential for the survival of 100 individuals for duration of 48 hours. **Hence, statement 1 is not correct.**

31. With reference to International Civil Aviation Day, consider the following statements

1. International Civil Aviation Day is celebrated on December 7th every year.
2. The theme for International Civil Aviation Day 2023 is "Advancing Innovation for Global Aviation Development".

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: International Civil Aviation Day is celebrated on December 7th every year. The International Civil Aviation Organization (ICAO) is a specialized agency of the United Nations. The day also recognises the special contribution of the International Civil Aviation Organisation (ICAO) in maintaining the efficiency, safety and cooperation of international aviation. It was established in 1994 as part of the International Civil Aviation Organization's (ICAO) 50th anniversary. The United Nations General Assembly officially recognized the day in 1996. The United Nations and other international organizations celebrate this day to recognize the importance of aviation to the world's social and economic development. The theme for International Civil Aviation Day 2023 is "Advancing Innovation for Global Aviation Development". Hence, both statements are correct.

32. Consider the following statements regarding Environment Impact Assessment:

Statement I - Environmental Impact Assessment (EIA) is a tool used to evaluate the positive and negative environmental, economic and social impacts of a project.

Statement II - It is used to predict the environmental impacts of a project in the pre-planning stage so that decisions can be taken to reduce the adverse impacts.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (B) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (C) Statement-I is correct but Statement-II is incorrect
- (D) Statement-I is incorrect but Statement-II is correct

Answer: (A)

Explanation: Recently, the Union government told to the Parliament that the Char Dham project in Uttarakhand, under which the Silkyara tunnel is being developed, did not require an Environment Impact Assessment (EIA). **Environmental Impact Assessment (EIA) is a tool used to evaluate the positive and negative environmental, economic and social impacts of a project.** It is used to predict the environmental impacts of a project in the pre-planning stage so that decisions can be taken to reduce the adverse impacts. **The concept of EIA emerged in the 1960s and 1970s as a response to growing concerns about the environmental impacts of large-scale development projects.** On 27 January 1994, the Union Ministry of Environment and Forests, Government of India issued the first EIA notification. Hence, both Statement-I and

Statement-II are correct and Statement-II is the correct explanation for Statement-I.

33. Lakadong Turmeric, recently seen in news, has been awarded Geographical Indication (GI) tag. It belongs to which of the following state?

- (a) Sikkim
- (b) Meghalaya
- (c) Andhra Pradesh
- (d) Mizoram

Answer: (B)

Explanation: Recently, Lakadong Turmeric of Meghalaya has been awarded with the Geographical Indication (GI) tag. Lakadong turmeric is a variety of turmeric that originated in Jaintia Hills, Meghalaya. Lakadong turmeric is considered to be one of the world's best varieties of turmeric with a curcumin content of around 6.8 to 7.5 per cent. Curcumin is the compound that gives turmeric its bright yellow color and has anti-inflammatory and antioxidant properties. **Garo Dakmanda (traditional dress), Larnai pottery and Garo Chubitchi (alcoholic beverage) have also been awarded with the Geographical Indication (GI) tag. Hence, option (b) is correct.**

34. With reference to Global Partnership on AI (GPAI), consider the following statements:

- 1. It is a multi-stakeholder initiative which aims to bridge the gap between theory and practice on AI by supporting cutting-edge research and applied activities on AI-related priorities.
- 2. At present, it has 29 members and India is also a member of this initiative.
- 3. The partnership is engaged in providing financial support and carrying out research and development activities in the field of artificial intelligence.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: The Ministry of Electronics and Information Technology (MeitY), Government of India is pleased to announce that it will assume the **role of Lead Council Chair for the Global Partnership on Artificial Intelligence (GPAI) and will host the prestigious GPAI Summit in New Delhi from December 12 to 14, 2023.** The GPAI Summit brings together engaged minds and expertise from science, industry, civil society, governments, international organisations and academia to foster international cooperation on the future of artificial intelligence and its impact on society. This summit will focus on various critical aspects of AI, including responsible AI, data governance, future of

work and innovation and commercialization. GPAI is a multi-stakeholder initiative bringing together leading experts from science, industry, civil society, international organizations, and government that share values to bridge the gap between theory and practice on AI by supporting cutting-edge research and applied activities on AI-related priorities. **GPAI is a congregation of 28 Member Countries and the European Union. India had joined the group as a founding member in 2020.** GPAI is not directly involved in funding or conducting AI research and development. It's primarily focused on developing principles and guidelines for responsible AI development, rather than conducting research itself. **Hence, statement 3 is not correct.**

35. Consider the following:

1. Garba
2. Sankirtana
3. Bihu dance
4. Mudiyettu
5. Nawrouz and Yoga

Which of the above are included in the UNESCO's Intangible Heritage List?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

Answer: (C)

Explanation: "Garba of Gujarat" has been inscribed in the Representative List of Intangible Cultural Heritage (ICH) of Humanity by UNESCO. **Garba of Gujarat becomes the 15th element** from India to join the Intangible Cultural Heritage (ICH) list. **India's additions in Intangible Heritage List:**

- **2023:** Garba of Gujarat
- **2021:** Durga Puja in Kolkata
- **2017:** Kumbh Mela
- **2016:** Nawrouz and Yoga
- **2014:** Traditional brass and copper craft of utensil making among the Thatheras of Jandiala Guru, Punjab
- **2013:** Sankirtana, ritual singing, drumming and dancing of Manipur
- **2012:** Buddhist chanting of Ladakh: recitation of sacred Buddhist texts in the trans-Himalayan Ladakh region, Jammu and Kashmir
- **2010:**
 - √ Chhau dance
 - √ Kalbelia folk songs and dances of Rajasthan
 - √ Mudiyettu, ritual theatre and dance drama of Kerala
- **2009:** Ramman, religious festival and ritual theatre of the Garhwal Himalayas
- **2008:**
 - √ Kutiyattam, Sanskrit theatre
 - √ Tradition of Vedic chanting

√ Ramlila, the traditional performance of the Ramayana
Hence, option (c) is correct.

36. Consider the following statements regarding the Citizenship in India:

1. A person of full age and capacity, being a citizen of India, has the authority to make a declaration renouncing their Indian citizenship.
2. Indian citizenship automatically ceases when a citizen voluntarily acquires the citizenship of another country.
3. Termination of Indian citizenship occurs if the resident has been detained for two years in any nation within five years of enrollment or naturalization

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: The Citizenship Act of 1955 outlines three methods for losing citizenship, irrespective of whether it was acquired under the Citizenship Act or earlier laws. **These methods include Termination, Renunciation, and Deprivation. Through Renunciation, any overseas Indian citizen of full age (18 and above) can formally declare the renouncement of their Indian citizenship, leading to the cessation of their status as an Indian resident.** In case such a declaration is made during a conflict involving India, the registration process may be delayed by the Federation. Hence statement 1 is correct. **Through Termination, if an Indian resident consciously and voluntarily acquires the citizenship of another nation, their Indian citizenship automatically ceases.** It's important to note that this condition does not apply in the context of a war in which India is involved. **Hence statement 2 is correct.** The Federation has established mandatory grounds for the termination of Indian citizenship. These grounds include acquiring citizenship through conspiracy, demonstrating disloyalty to the Indian Constitution, engaging in illegal collaboration or association with the enemy during a war, facing two-year detention in any foreign nation within five years of enrollment or naturalization, and maintaining continuous ordinary residence outside of India for seven consecutive years. In such instances, **the Federation is empowered to effect the termination of Indian citizenship. Hence statement 3 is correct.**

37. Consider the following statements about the Global Partnership on Artificial Intelligence:

1. India is not a founding member of the Global Partnership on Artificial Intelligence (GPAI).
2. The Theme of the GPAI Summit 2023 is "Advancing Responsible AI in Private-Sector Applications"
3. This collaborative AI initiative involving various

stakeholders seeks to address the gap between AI theory and practice.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Launched in June 2020 with fifteen members, the Global Partnership in Artificial Intelligence is the realization of an idea conceived within the G7. This multi-stakeholder initiative aims to bridge the gap between AI theory and practice by supporting cutting-edge research and applied activities on AI-related priorities. By uniting experts from science, industry, civil society, governments, international bodies, and academia, the initiative fosters international cooperation in artificial technology. **The founding members include Australia, Canada, France, Germany, India, Italy, Japan, Mexico, New Zealand, the Republic of Korea, Singapore, Slovenia, the UK, the US, and the EU. Hence statement 1 is incorrect and Statement 3 is correct.** The Research Symposium, themed "Advancing Responsible AI in Public-Sector Applications," aims to unite global AI experts, academia, and practitioners. It's an opportunity to present actionable research fostering responsible AI, aligning with the broader goals of GPAI. **Hence statement 2 is incorrect**

38. Hatti Community is found in which States?

- (a) Himachal Pradesh
- (b) Himachal Pradesh and Uttarakhand
- (c) Sikkim
- (d) Arunachal Pradesh

Answer: (B)

Explanation: A Hatti community organization in Himachal Pradesh has recently announced a protest march scheduled for December 16. This close-knit community resides near the Trans-Giri area of Himachal Pradesh and Jaunsar Bawar in Uttarakhand, with the Tons River, a tributary of the Yamuna, serving as the border between the two states. Named after their traditional occupation of selling homegrown vegetables, crops, and meat, the **Hattis are divided into two categories: Bhat and Khash, holding higher status, and Badhois, with lower status.** This community in Himachal Pradesh's Sirmour district was officially added to the Scheduled Tribes (ST) list in 2022 after a prolonged demand for ST status since 1967. **Hence Correct Answer is B.**

39. Consider the following statements about the PM-DevINE.

- (a) A scheme that aims to address development gaps in the North Eastern Region.
- (b) A scheme that aims to provide affordable air travel for the North East region.
- (c) A scheme that aims to address road connectivity in the North Eastern Region.
- (d) A scheme that aims to address insurgency in the North Eastern Region.

Answer: (A)

Explanation: The Prime Minister's Development Initiative for North East Region (PM-DevINE) is a scheme designed to tackle development gaps in the North Eastern Region (NER). **The NER comprises eight states: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura.** This initiative, unveiled in the Union Budget 2022-23, functions as a Central Sector Scheme, receiving full funding (100%) from the central government to ensure comprehensive development in the region. **Hence Correct Answer is A.**

40. The doctrine of the basic structure of the Indian Constitution was established under which judgment.

- (a) Golaknath Case (1967)
- (b) Minerva Mills Case (1980)
- (c) Kesavananda Bharati case (1973)
- (d) AK Gopalan Case (1950)

Answer: (C)

Explanation: In the **Minerva Mills case, the Supreme Court provided key clarifications on the interpretation of the basic structure doctrine.** The court ruled that the power of the parliament to amend the constitution was limited by the constitution. Hence the parliament cannot exercise this limited power to grant itself unlimited power. **The ruling struck down clauses 4 and 5 of the Constitution (Forty-second Amendment) Act, 1976 enacted during the Emergency imposed by Prime Minister Indira Gandhi.** In the **Golaknath Case, the Supreme Court ruling emphasized that Parliament does not possess the authority to amend the Constitution unilaterally.** Instead, the power to amend lies with the constituent assembly, as stipulated in Article 368. The **pivotal 1950 AK Gopalan Case** established a significant precedent by ruling that **Parliament could no longer make amendments to the constitution, a power it previously held.** This decision, influenced by **articles 13, 19, 21, and 22 under the Prevention Act, restricted Parliament's authority to amend the constitution.** The **Kesavananda Bharati case of 1973** marked a landmark in the Supreme Court of India, establishing the doctrine of the basic structure of the Indian Constitution. **Hence Correct Answer is C.**

41. With reference to GNoME, consider the following statements:

1. It is an Artificial Intelligence (AI) tool developed by Google's DeepMind laboratory.
2. It is designed for predicting the structures of new materials.
3. GNoME has significantly improved the accuracy of predicting material stability from 50% to approximately 80%.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: GNoME stands for Graph Networks for Materials Exploration. It is a Deep Learning AI tool developed by researchers at Google DeepMind. It is designed for predicting the structures of new materials. It is a state-of-the-art Graph Neural Network (GNN) model. The input data for GNoME takes the form of a graph, representing connections between atoms. It employs "active learning," a technique that allows the model to scale up from a small specialized dataset. This technique involves introducing new targets, enabling machine learning to label new data with human assistance. GNoME's predictions have implications for various sectors, including renewable energy, battery research, semiconductor design and computing efficiency. GNoME has significantly improved the accuracy of predicting material stability from 50% to approximately 80%. It has increased the number of known stable materials. This could lead to the development of new technologies such as more efficient batteries and superconductors. It uses filters to narrow down the list of potential materials. This saves time and money by avoiding the need to synthesize and test materials that are unlikely to be stable. Hence, all statements are correct.

42. Consider the following statements regarding Dodo:

1. The dodo (*Raphus Cucullatus*) is an extinct flightless bird that was native to Maldives, an island in the Indian Ocean.
2. It is considered the ultimate symbol of human-induced extinction.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: Recently, the Geneticists and conservationists have joined forces to re-introduce the Dodo, extinct since the late 17th century, to its once native habitat in the island of Mauritius. The dodo

(*Raphus Cucullatus*) is an extinct flightless bird that was native to Mauritius, an island in the Indian Ocean. It was part of the genus *brisson* and the Columbidae family. Dutch sailors who first arrived in Mauritius in 1598 hunted dodos for meat. It is considered the ultimate symbol of human-induced extinction. The dodo was about three feet tall and weighed 22–40 pounds. It was larger than a turkey and about the size of a swan. It had blue-gray plumage, brown feathers and a white tail plume. Hence, statement 1 is not correct.

43. Consider the following passage:

This river was formed by glaciers that melted 12,000 years ago. It originates from Lake Itasca in northern Minnesota, emerging as a small stream and ends in the Gulf of Mexico. It is the second longest river in North America. The major tributaries of this river are Arkansas, Illinois, Missouri, Ohio and Red river. It is the world's fourth longest river system after Nile, Amazon and Yangtze.

Which of the following river is discussed in the above passage?

- (a) Mississippi River
- (b) Missouri River
- (c) Colorado River
- (d) Columbia River

Answer: (A)

Explanation: Recently, the National Mission for Clean Ganga (NMCG) made a significant stride by signing a Memorandum of Common Purpose (MoCP) with the Mississippi River Cities and Towns Initiative (MRCTI). The Mississippi River was formed by glaciers that melted 12,000 years ago. It originates from Lake Itasca in northern Minnesota, emerging as a small stream and ends in the Gulf of Mexico. It is the second longest river in North America. The Major tributaries of the Mississippi River are the Upper Mississippi, Arkansas, Illinois, Missouri, Ohio and Red rivers. It is the world's fourth longest river system after Nile, Amazon and Yangtze. Hence, option (a) is correct.

44. Consider the following statements regarding Climate Change Performance Index 2024:

1. The Climate Change Performance Index (CCPI) published biannually since 2005 is an independent monitoring tool that tracks the climate protection performance of 63 countries and the EU.
2. The CCPI assesses each country's performance in three categories namely; GHG Emissions (40% of the overall ranking), Renewable Energy (20%) and Climate Policy (20%).
3. India secured the tenth rank in the 2024 Climate Change Performance Index (CCPI).

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (D)

Explanation: The Climate Change Performance Index (CCPI) published annually since 2005 is an independent monitoring tool that tracks the climate protection performance of 63 countries and the EU. It aims to enhance transparency in international climate politics and enables comparison of climate protection efforts and progress made by individual countries. **In the CCPI 2024, Denmark reaches the best ranking. Again, no country performs well enough in all categories to achieve an overall “very high” rating in the index.** Therefore, the first three ranks in the overall ranking remain empty. Denmark reaches the best ranking, followed by Estonia in 5th place and the Philippines in 6th place in this year's CCPI. **The CCPI assesses each country's performance in four categories: GHG Emissions (40% of the overall ranking), Renewable Energy (20%), Energy Use (20%) and Climate Policy (20%).** India has been ranked seventh in climate performance during 2022, shows the report Climate Change Performance Index (CCPI) 2024. **Hence, all statements are not correct.**

45. With reference to Advocates Amendments Bill, consider the following statements:

1. Its primary objective is to eradicate 'touts' from the legal system by repealing the antiquated Legal Practitioners Act, 1879, and amending the Advocates Act, 1961.
2. The new Bill inserts Section 45A into the 1961 Act, empowering High Courts and district judges to frame and publish lists of touts.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: The Advocates Amendment Bill, 2023, was passed in the Lok Sabha during the first day of the Parliament's Winter Session. **The Advocates Amendment Bill, 2023, successfully passed in the Lok Sabha during the Parliament's Winter Session. Its primary objective is to eradicate 'touts' from the legal system by repealing the antiquated Legal Practitioners Act, 1879, and amending the Advocates Act, 1961.** The new Bill inserts Section 45A into the 1961 Act, empowering High Courts and district judges to frame and publish lists of touts. Individuals' names won't be included without providing them an opportunity to contest the allegations. Alleged touts can be reported to

subordinate courts for inquiry, with subsequent actions taken based on the findings. Conviction as a tout results in inclusion in a published list in every court, accompanied by potential imprisonment. **A 'Tout' is a person, who induces/instigates, on the basis of falsity, any party of a court's case/complaint/matter to engage any particular lawyer for conduction of said case/complaint/matter in the court. Hence, both statements are correct.**

46. Consider the following statements about Global Renewables and Energy Efficiency Pledge:

1. At COP28, a pledge to triple the global green energy capacity was signed by 118 countries.
2. It requires countries to double the global average annual rate of energy efficiency improvements.
3. India is a participant of this pledge.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation:

- **At COP28, a commitment was made by 118 countries to triple the world's green energy capacity, targeting 11,000 GW by 2030.**
- **The commitment necessitates doubling the global average annual rate of energy efficiency improvements from 2% to over 4% annually until 2030.**
- **The primary goal is to mitigate emissions and constrain the global average temperature increase to below 2 degrees Celsius, aligning with the 2015 Paris Agreement.**
- **Pledge Specifics:**
 - The commitment lacks legal binding and is not officially on the COP28 agenda.
 - COP28 will also delve into the matter of tripling renewable energy, with considerable anticipation for the outcomes.
 - The commitment reflects a unified resolve among global leaders to actively combat worldwide emissions.
- **India and China opted not to participate, expressing reservations about the call to phase down coal and halt investments in new coal-fired power plants.**

47. Pinna nobilis, recent seen in news is a:

- (a) Archaeological fossil of Jurassic times
- (b) Avian species found in Alaska
- (c) Marina mollusk of Mediterranean Sea
- (d) A Himalayan herb

Answer: (C)

Explanation:

- **Pinna nobilis, also known as the noble pen shell or fan mussel, is a sizable marine bivalve mollusk indigenous to the Mediterranean Sea.**

- In the Adriatic aquarium of Pula, these **mollusks are housed in meticulously filtered water, safeguarding them from potential parasitic threats.**
- The shell of the noble pen shell can reach lengths of 1.2 meters, comprising two articulated parts.
- Habitually found in seagrass meadows and diverse underwater terrains, it thrives **at depths of up to 60 meters.**
- Significantly, the **species plays a crucial ecological role by filtering and retaining substantial amounts of organic matter from suspended detritus,** contributing to water clarity.
- Designated as an endangered and protected species since 1992, *Pinna nobilis* confronts threats from human activities and grapples with the risk of widespread mass extinctions across different regions of the Mediterranean Sea.

48. Consider the following countries:

1. Armenia
2. Azerbaijan,
3. Tajikistan
4. Turkey
5. Pakistan
6. Jordan

How many of the above mentioned countries are neighbours of Iran?

- (a) Only three
- (b) Only four
- (c) Only five
- (d) All six

Answer: (B)

Explanation: Geographical Position: Iran, officially recognized as the Islamic Republic of Iran and historically referred to as Persia, is situated in South-West Asia.

Territorial Limits: Iran is surrounded by Armenia, Azerbaijan, and the Caspian Sea to the North, Turkmenistan to the Northwest, Turkey and Iraq to the West, the Persian Gulf and the Gulf of Oman to the South, and Afghanistan and Pakistan to the East.

49. Consider these articles of the Universal Declaration of Human Rights.

1. **Article 1-** All human beings are born free and equal and should be treated the same way.
2. **Article 4-** No one has the right to treat you as a slave
3. **Article 7** - Right to equality before the law
4. **Article 19** - Freedom of Expression

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) All Four

Answer: (D)

Explanation: The Universal Declaration of Human Rights (UDHR) was influenced by **the Code Napoléon and adopted a structure that included a preamble and general principles.**

The definitive format took shape in the second draft, guided by the efforts of French jurist René Cassin, who refined the original draft crafted by Canadian legal scholar John Peters Humphrey.

50. Consider the following statement.

A Zoological Park in Darjeeling, West Bengal, is India's largest high-altitude zoo, located at 7,000 feet. In 1983, it began a rare species captive breeding project, expanding to a Snow Leopard conservation program in 1986 and a Red Panda project in 1990. The park demonstrates a steadfast commitment to conservation through strategic breeding efforts.

The above description describes which of the following Zoological parks?

- (a) Indira Gandhi Zoological Park
- (b) Nandankanan Zoological Park
- (c) Rajiv Gandhi Zoological Park
- (d) Padmaja Naidu Himalayan Zoological Park

Answer: (D)

Explanation: Indira Gandhi Zoological Park is located amidst **Kambalakonda Reserve Forest in Visakhapatnam, Andhra Pradesh, India.** It is the **third-largest zoo in the country.** You can observe different animals and bird species here.

Nandankanan Zoological Park stands as a prominent zoo and botanical garden situated in Bhubaneswar, Odisha, India. Its establishment dates back to 1960, with public access granted in 1979. Notably, in 2009, it achieved the distinction of being the first zoo in India to join the World Association of Zoos and Aquariums (WAZA). The zoo enjoys a good reputation internationally for successfully breeding black panthers, gharials, and white tigers in captivity.

The Rajiv Gandhi Zoological Park, commonly known as the Rajiv Gandhi Zoo or Katraj Zoo, is located in Katraj, Pune district, Maharashtra State, India. An ex-situ breeding center is also planned by the zoo. **The Padmaja Naidu Himalayan Zoological Park (PNHZA) in Darjeeling, West Bengal, named after Padmaja Naidu, daughter of Sarojini Naidu,** was established on August 14, 1958. A joint venture of the Indian government (Department of Science and Technology) and the West Bengal government (Department of Education), it is India's largest high-altitude zoo at 7,000 feet elevation. In 1983, it initiated a captive breeding project for rare species, with the first ex-situ conservation breeding program for Snow Leopards in 1986. The Red Panda project commenced in 1990.

51. Consider the following statements regarding the Chief Minister:

1. The Governor can send back the proposal of Chief Minister to appoint a person a minister.
2. Governor has discretion in choosing a successor a chief minister who has just passed away.
3. Chief minister is the vice-chairman of interstate councils.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation:

The Chief Minister suggests ministers appointed by the governor and holds the authority to dissolve the council by resignation. **As per Article 167, the Chief Minister acts as the liaison between the Governor and the state council of ministers.** Importantly, there is no provision to send back proposals for ministerial appointments, highlighting the Chief Minister's pivotal role in state governance. **Hence statement 1 is incorrect.** If the Chief Minister passes away without naming a successor, the Governor can choose someone using their own judgment. But if the ruling party suggests a candidate, the Governor has to appoint that person. This shows how leadership changes work in government, involving a mix of the Governor's discretion and the party's choices. **Hence statement 2 is correct.** The **Chief Minister serves in a rotational capacity as the vice-chairman of the pertinent zonal council, holding the position for one year at a time.** Additionally, the Chief Minister assumes membership in both the Prime Minister's Inter-State Council and the NITI Aayog Governing Council. **Hence statement 3 is incorrect.**

52. Consider the following applications of Carbon Capture:

1. Production of artificial fuels
2. Mineral carbonation
3. Indoor agriculture
4. Preservation of perishables

How many of the above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (D)

Explanation: One promising avenue for captured carbon is mineralization, where it undergoes a reaction with specific minerals to create stable carbonates. **These carbonates can then be securely stored underground or utilized in the production of construction materials.** This process, known as mineral carbonation, presents a reliable and enduring means of carbon storage.

Another application involves combining captured CO₂ with hydrogen, often generated through electrolysis using renewable energy. This combination results in the production of artificial fuels like artificial natural gas, synthetic diesel, or even synthetic jet fuel. **This method contributes to the development of sustainable alternatives in the fuel industry.** Additionally, **captured carbon dioxide can find purpose in enhancing plant growth within greenhouses and indoor agriculture facilities.** By supplying carbon dioxide to these environments, it becomes a valuable resource for optimizing plant conditions. Furthermore, captured carbon dioxide serves a practical role in the production of dry ice—a solid form of carbon dioxide at extremely low temperatures. This versatile substance is widely used for shipping and transporting perishable goods, fulfilling medical and scientific needs, and creating special effects in the entertainment industry.

53. Which of the following statements is not correct?

- (a) It is an international initiative aimed at promoting the responsible and human-centered development and utilization of Artificial Intelligence.
- (b) In 2020, India joined GPAI as a founding member.
- (c) The Secretariat of GPAI is hosted at the OECD.
- (d) All G20 members are also members of GPAI.

Answer: (D)

Explanation: GPAI, the Global Partnership on Artificial Intelligence, is a **collaborative initiative involving various stakeholders.** Its primary goal is to narrow the divide between AI theory and practical implementation by endorsing advanced research and applied endeavors focused on AI-related priorities. **Hence option (a) is correct.** Anchored in a collective dedication to the OECD Recommendation on Artificial Intelligence, which also hosts the secretariat, GPAI unites diverse perspectives and expertise from the realms of science, industry, civil society, governments, international organizations, and academia to promote global cooperation. **Hence option (b) is correct.** **India had joined GPAI in 2020 as a founding member and took over the presidency from France in 2022.** **Hence option (c) is correct.** **Members:** Argentina, Australia, Belgium, Brazil, Canada, Czech Republic, Denmark, France, Germany, India, Ireland, Israel, Italy, Japan, Republic of Korea, Mexico, Netherlands, New Zealand, Poland, Senegal, Serbia, Singapore, Slovenia, Spain, Sweden, Türkiye, United Kingdom, United States, and the European Union. **Hence option (d) is not correct.**

Hence the answer is (d).

54. Demaorchestia alanensis, recently seen in news, is a/an:

- (a) Rare species of orchid
- (b) Newly discovered planet
- (c) Type of marine crustacean
- (d) Endangered bird species

Answer: (C)

Explanation:

- Researchers at **Berhampur University in Odisha** have discovered a new species of marine amphipod in Chilika Lake on the east coast of India.
- The shrimp-like crustacean belongs to the **genus Demaorchestia and has been named Demaorchestia alanensis** in honor of Professor Alan Myers of University College Cork, Ireland, a global expert in marine amphipod studies. **Hence option (c) is correct.**
- Professor Myers has made significant contributions to the field, prompting the naming of the newly discovered species after him.
- **Demaorchestia alanensis is characterized by its white color and measures less than 15 millimeters in length, featuring 13 pairs of legs.** Three pairs are adapted for swimming, eight for walking on land, and the remaining two pairs are used for capturing prey and feeding.
- The species can be distinguished from others in the genus by the presence of two to three strong, hair-like structures on the anterior margin of the propodus of the gnathopod.
- **Demaorchestia alanensis belongs to the subfamily Platorchestiinae** and is commonly found along the Indian coast.

55. Consider the following seas:

1. Red Sea
2. Yellow Sea
3. Black Sea
4. White Sea

Arrange the above given seas in order from South to North:

- (a) 1,2,3,4
- (b) 2,1,3,4
- (c) 1,3,2,4,
- (d) 1,4,2,3

Answer: (A)

Explanation:

56. Consider the following statements regarding Asia and the Pacific Regional Overview of Food Security and Nutrition 2023:

1. Undernourishment in the Asia-Pacific region has fallen in 2022.
2. About half of world's undernourished people are living in Asia-Pacific region.
3. Prevalence rates of stunting, wasting, and obesity in children under five are also falling.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation:

The Asia-Pacific region, home to 370.7 million undernourished individuals, accounts for half of the worldwide total. Although undernourishment in this region decreased to 8.4% in 2022 from 8.8% in the preceding year, it remains 55 million higher than the 2019 figure. **Hence statement 1 is correct.** In 2022, approximately 55 million additional individuals in Asia experienced undernourishment compared to pre-COVID-19 levels. **The most severely impacted area is Southern Asia, where around half of the global undernourished and food-insecure population resides within the Asia-Pacific region. Hence statement 2 is correct.** The rates of stunting, wasting, and obesity among children under the age of five are on the rise. Southern Asia stands out with the highest proportion of children under five affected by wasting, surpassing the global average in 2022. **Hence statement 3 is incorrect.**

57. Consider the following statements:

1. IPC establishes rules and guidelines for fair trial, sentencing, and appeals.
2. CrPC defines criminal actions and their corresponding punishments.

Which of the above statements are correct?

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (D)

Explanation: The Indian Penal Code (IPC) comprehensively outlines criminal actions and their corresponding penalties, constituting substantive criminal law that addresses a diverse range of offenses. Applicable nationwide across the entire territory of India, the IPC categorizes offenses into sections, encompassing crimes against persons, property, and more. **It serves as the primary source of substantive criminal law in India, working in tandem with the Criminal Procedure Code (CrPC) to ensure the effective**

enforcement of criminal laws. The IPC covers a wide spectrum of offenses, including those against persons, property, morality, and public tranquility, specifying the applicable offenses and penalties in various situations. **Hence statement 1 is incorrect.** The Criminal Procedure Code (CrPC) delineates the procedures involved in the investigation, trial, and punishment of criminal offenses. It primarily addresses the administration of criminal justice and procedural aspects, constituting procedural law that outlines the steps for enforcing criminal laws. **Applicable across India, with exceptions for Jammu and Kashmir, the CrPC focuses on the procedural intricacies of arrest, bail, investigation, trial, and appeals. It establishes rules and guidelines to ensure a fair trial, just sentencing, and proper appeals process, outlining the legal procedures to be followed during criminal proceedings.** The CrPC is designed to facilitate the fair and efficient administration of criminal justice, working in conjunction with the Indian Penal Code (IPC) to provide the legal framework for criminal procedures. Emphasizing procedural aspects, the CrPC ensures due process and safeguards the rights of individuals, contributing to the lawful and just application of criminal laws throughout legal proceedings, including arrest procedures, bail hearings, trial processes, and appeals. **Hence statement 2 is incorrect.**

58. Which of the statements about the Global River Cities Alliance is not correct?

- (a) At the UN Climate Change Conference in Dubai, the National Mission for Clean Ganga launches the Global River Cities Alliance.
- (b) Global river cities include Den Haag (Netherlands), Adelaide (Australia), Szolnok (Hungary).
- (c) The alliance covers global cities in 11 countries
- (d) The Secretariat of the Alliance is established at Ministry of Jal Shakti.

Answer: (D)

Explanation: The Global River Cities Alliance (GRCA) is inaugurated by the National Mission for Clean Ganga (NMCG) during the United Nations Climate Change Conference in Dubai. **Launched under India's Ministry of Jal Shakti, the initiative includes partner countries such as Egypt, Netherlands, Denmark, Ghana, Australia, Bhutan, Cambodia, Japan, and global river cities like Den Haag 'The Hague' (Netherlands), Adelaide (Australia), Szolnok (Hungary).** Noteworthy international funding organizations, including the World Bank, Asian Development Bank, Asian Infrastructure Investment Bank, and knowledge partner KPMG, are also integral members of GRCA. **Hence statements (a) and (b) are correct.** It seeks to promote widespread adoption of sustainable river management practices worldwide. **Encompassing 275+ river cities across 11 countries, its mission is to drive large-scale initiatives for the sustainable development of river ecosystems.** **Hence statement (c) is correct.**

The Alliance centers its efforts on three main themes: Networking, Capacity Building, and Technical Support. The Secretariat of the Alliance is headquartered at the National Institute for Urban Affairs (NIUA). **Hence statement (d) is incorrect.**

59. Consider the following statements about Green Hydrogen:

- 1. Green hydrogen refers to hydrogen gas generated by electrolyzing water using renewable energy.
- 2. The Green Hydrogen Catapult, an initiative by the India and United States, aims to reduce the cost of green hydrogen.
- 3. It can be used in a fuel cell but can't be used for direct combustion.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: **Green hydrogen is generated by employing renewable power in the electrolysis of water.**

The process of electrolysis, used to split water into hydrogen and oxygen, is energy-intensive. **Hence statement 1 is correct.**

The Green Hydrogen Catapult, a United Nations initiative focused on reducing the cost of green hydrogen, has declared its intention to nearly double its target for green electrolyzers. **The previous goal, set at 25 gigawatts last year, is now increased to 45 gigawatts by 2027. Hence statement 2 is incorrect.**

Green hydrogen serves as a clean and sustainable fuel with versatile applications, including:

1. Internal Combustion: Green hydrogen can be directly employed as a fuel for internal combustion engines. This involves mixing hydrogen with air and igniting the mixture. Internal combustion engines powered by hydrogen function similarly to gasoline-powered engines but produce no emissions. **Hence statement 3 is incorrect.**

2. Blending with Natural Gas: Green hydrogen can be blended with natural gas and utilized as fuel for heat or power generation. When combined with natural gas, hydrogen contributes to the reduction of greenhouse gas emissions.

3. Hydrogen Fuel Cells: Green hydrogen finds application in hydrogen fuel cells for vehicle propulsion. Hydrogen fuel cells are devices that convert hydrogen and oxygen into electricity. The generated electricity can then power the motor of a vehicle, offering an environmentally friendly alternative for transportation.

60. Consider the following peninsulas around the world:

1. Labrador peninsula
2. Kamchatka peninsula
3. Deccan peninsula
4. Iberian peninsula

Arrange the above given seas in order from West to East:

- (a) 2,4,3,1
- (b) 2,1,3,4
- (c) 1,4,3,2
- (d) 1,4,2,3

Answer: (A)

Explanation: Labrador Peninsula: The Labrador Peninsula is situated in eastern Canada and is part of the larger Labrador region, which is predominantly in the province of Newfoundland and Labrador. It is bounded by the Labrador Sea to the east, the Hudson Bay to the west, and the Quebec mainland to the southwest.

Kamchatka Peninsula: The Kamchatka Peninsula is located in the Russian Far East, extending into the Pacific Ocean. It is surrounded by the Sea of Okhotsk to the west, the Bering Sea to the east, and the Pacific Ocean to the southeast. The Kamchatka Peninsula is known for its volcanic activity and diverse ecosystems.

Deccan Peninsula: The Deccan Peninsula is a large landmass in southern India, separated from the rest of the Indian subcontinent by the Satpura and Vindhya mountain ranges. It is surrounded by the Arabian Sea to the west, the Bay of Bengal to the east, and the Indian Ocean to the south. The Deccan Plateau, a significant part of the peninsula, is known for its diverse landscapes.

Iberian Peninsula: The Iberian Peninsula is located in southwestern Europe and is shared by two countries, Spain and Portugal. It is surrounded by the Atlantic Ocean and the Mediterranean Sea. The Pyrenees Mountains form the natural boundary between the Iberian Peninsula and the rest of Europe to the north. The Strait of Gibraltar separates it from North Africa to the south.



61. Consider the following statements:

1. A member Lok Sabha can be suspended only by a motion passed by the Parliament with a simple majority.

2. There is no need of passing a motion for revocation of such suspension.
3. Article 122 of the constitution bars the judicial review of proceedings of Parliament.
4. The suspension of MPs cannot be more than the length of the ongoing session.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation:

An MP will face an automatic suspension of either five days or for the duration of the remaining session, whichever is shorter. The House retains the authority to resolve and end this suspension at any point. Hence statement 1 is incorrect. The Speaker does not possess the authority to lift or revoke the suspension order. The prerogative to revoke the suspension lies with the House itself. If the House wishes to do so, it can pass a motion to revoke the suspension of a Member. Hence statement 2 is incorrect. Article 122 of the Indian Constitution establishes the immunity of parliamentary proceedings from judicial review, emphasizing their exemption from court scrutiny. Nevertheless, there have been instances where courts have intervened in the procedural functioning of legislatures, despite this constitutional provision. Hence statement 3 is correct. Rule 374 authorizes the Presiding Officers to name legislators persistently disrupting the House after repeated warnings. Following this, the House can propose a motion to suspend the MP for the remainder of the session. Hence statement 4 is correct.

62. Consider the following statements about road accidents around the world:

1. There is an overall fall in number of fatalities in road accidents around the world.
2. India has seen a rise in road accidents by about 15%.
3. Western European region accounts for majority of accidents.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: In 2021, approximately 1.19 million road traffic fatalities were reported, reflecting a 5% decrease from the 1.25 million deaths documented in 2010. Despite a significant growth in the global motor vehicle

fleet, substantial expansions of road networks, and an almost one-billion rise in the global population, efforts to improve road safety have resulted in a modest overall decline in fatalities. India experienced a notable upswing in fatalities, with a 15% increase, rising from 1.34 lakh in 2010 to 1.54 lakh in 2021. Over half of the United Nations Member States achieved a reduction in road traffic deaths between 2010 and 2021. **Hence statements 1 and 2 are correct.** Regional discrepancies reveal that 28% of all fatalities occur in the WHO South-East Asia Region, 25% in the Western Pacific Region, 19% in the African Region, 12% in the Region of the Americas, 11% in the Eastern Mediterranean Region, and 5% in the European Region. **The European Region has observed the most substantial reduction in deaths since 2010, reporting a 36% decline. Hence statement 3 is incorrect.**

63. Which of the following statements about Constellation Gemini is not correct?

- (a) Gemini is a zodiac constellation located in the Western celestial hemisphere
- (b) Gemini lies between Taurus to the west and Cancer to the east with Auriga and Lynx to the north
- (c) Gemini is highly visible in the winter skies of the Northern Hemisphere, remaining observable throughout December–January nights.
- (d) Gemini is supposed to stay at its position until 27th Century.

Answer: (A)

Explanation: Gemini, a zodiac constellation situated in the northern celestial hemisphere, holds historical significance as one of the 48 constellations meticulously documented by the 2nd-century AD astronomer Ptolemy. Enduring through time, **Gemini retains its status among the 88 modern constellations** and is intricately linked with the mythological twins Castor and Pollux from Greek mythology. **Hence option (a) is not correct.**

In the vast canvas of the night sky, **Gemini finds its place between Taurus to the west and Cancer to the east.** To the north, it shares proximity with Auriga and Lynx, while Monoceros and Canis Minor lie to the south, and Orion graces the southwest. In classical antiquity, Cancer marked the Sun's position during the northern solstice (June 21). However, the **gradual shift known as axial precession relocated this celestial boundary into Gemini around the 1st century AD.** The Sun's journey during the northern solstice made a transition from Gemini to Taurus in 1990, a position it will maintain until the 27th century AD before progressing into Aries. Gemini, taking center stage, becomes particularly prominent in the winter skies of the Northern Hemisphere, casting its celestial presence throughout the night during the months of December and January.

64. Consider the following statements about Ranthambore National Park:

- 1. Ranthambore National Park houses the Sambhar Salt Lake, the largest inland salt lake in India.
- 2. It is at the junction of the Aravali and Vindhya hill ranges.

Which of the statements is/are correct?

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: India's largest inland salt lake, Sambhar Lake, is situated in Sambhar Lake Town, Jaipur district, Rajasthan, approximately 80 km southwest of Jaipur and 64 km northeast of Ajmer. Hence statement 1 is incorrect.

Ranthambore National Park stands as one of Northern India's largest and most renowned national parks, situated in the southeastern part of Rajasthan's Sawai Madhopur district. **Originally established in 1955 under the name Sawai Madhopur Game Sanctuary, it earned the status of a national park in 1980.** Nestled at the convergence point of the Aravali and Vindhya hill ranges, this park has become a vital habitat for a diverse array of wildlife. **Hence statement 2 is correct.** Its significance is particularly pronounced in the realm of tiger conservation, as Ranthambore is home to a substantial population of Royal Bengal tigers. **Beyond these majestic creatures, the park hosts a variety of other wildlife, including leopards, nilgai, wild boar, sambar, and hyena.** This harmonious blend of flora and fauna adds to the allure of Ranthambore National Park, making it a key destination for nature enthusiasts and wildlife aficionados alike.

65. Barracuda, recently seen in news is a:

- (a) Mass nesting of Olive ridley turtles
- (b) India's fastest solar-electric boat
- (c) A Triassic age dinosaur
- (d) A deep sea coral

Answer: (B)

Explanation: Barracuda, the fastest solar-electric boat in India, is a groundbreaking creation by Navalt Solar and Electric Boats. This impressive vessel measures 14 meters in length and 4.4 meters in width, designed not only for passenger transport but also cargo carriage, accommodating up to 12 passengers. **With a remarkable top speed of 12.5 knots (23 kmph) and a seven-hour range on a single charge, Barracuda is equipped with twin 50 kW electric motors, a marine-grade LFP battery, and a 6 kW solar power system. Hence statement 2 is correct.** Designed to tackle rough seas with waves reaching up to four meters, Barracuda

ensures a smooth, noiseless operation without vibration or air pollution. **Beyond its technical prowess, the solar-electric boat aims to offer an eco-friendly and cost-effective alternative to traditional fossil-fuel boats, contributing to the cause of cleaner oceans.** Recognizing its innovative impact, Barracuda clinched the world's best startup award in the mobility and transportation category at the Berlin Start-up Energy Transition Awards 2023. This accolade further solidifies Barracuda's position as a transformative force in the realm of sustainable maritime transportation.

Arribada: Arribada, or mass nesting, is a distinctive behavior exhibited by olive ridley turtles, characterized by the gathering of thousands of females on the same beach to lay their eggs. During this remarkable event, the turtles engage in the process of laying eggs, a ritual that spans five to seven days. The eggs are deposited in conical nests, each approximately one and a half feet deep, meticulously dug by the turtles using their hind flippers.

66. Consider the following statements about Sovereign Gold Bonds:

1. The main purpose of this scheme is to monetize gold kept idle with the people of India.
2. The SGBs have to be purchased from the RBI like retail investments in Government bonds.
3. The interest earned under this scheme is not taxable under Income Tax Act, 1961.
4. These bonds can be used as collateral for loans.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation:

The Sovereign Gold Bond Scheme serves as an alternative avenue for individuals seeking ownership of gold. **Its primary objective is to decrease the demand for physical gold, thereby regulating gold imports and optimizing resource utilization.** Administered by the Reserve Bank of India (RBI), the scheme ensures transparency and fosters trust in gold ownership, providing individuals with a secure means to invest in gold without concerns about storage or safety. **Hence statement 1 is incorrect. Sovereign Gold Bonds are easily available to the public through post offices and banks, ensuring widespread access and convenient participation in the scheme. Hence statement 2 is incorrect.** The scheme offers a fixed interest rate of 2.5% per annum, paid semi-annually. However, it's important to note that the interest earned on Gold Bonds is taxable under the provisions of the Income Tax Act, 1961. **Hence statement 3 is incorrect.**

Sovereign Gold Bonds offer dual benefits to investors. Firstly, **bondholders can utilize them as collateral for obtaining loans.** Additionally, individuals benefit from a capital gains tax exemption upon redeeming the bonds, whether at maturity or before, as redemption involves the issuer repurchasing the bond. **Hence statement 4 is correct.**

67. Which of the following statements about Neanderthals is correct?

- (a) Neanderthals are named after the Neandertal Valley in France where the first identified specimen was found.
- (b) It is a member of genus Homo.
- (c) They were the first creatures to have an erect posture and walk bipedal.
- (d) Neanderthal DNA is not found in Modern Humans.

Answer: (B)

Explanation: Neanderthals derive their name from the Neandertal Valley, where the initial specimen was discovered. **This valley, originally spelled Neanderthal in English and Neanderthaler in German until the 1901 spelling reform, is a modest, picturesque locale situated along the Düsseldorf River in the German state of North Rhine-Westphalia.** Positioned approximately 12 km (7.5 mi) east of Düsseldorf, the capital city of North Rhine-Westphalia, this valley holds historical significance as the birthplace of the Neanderthal species. **Hence statement 1 is incorrect.** Neanderthals, alternatively spelled as Neandertals, represent an extinct species or subspecies of ancient humans, formally classified as Homo neanderthalensis or H. sapiens neanderthalensis. They inhabited Eurasia until approximately 40,000 years in the past. **Hence statement 2 is correct. Homo erectus was the first creatures to have an erect posture and walk bipedal. Its specimens are among the first recognizable members of the genus Homo. Hence statement 3 is incorrect.** Modern humans who lived about 40,000 years ago have been found to have up to 6-9% Neanderthal DNA. They were adept at crafting tools, controlling fire, sheltering, making clothing, hunting large animals, eating plants and occasionally creating symbolic objects. **Hence statement 4 is incorrect.**

68. Consider the following statements about Maldives:

1. Maldives is an archipelagic state in the South-East Asia.
2. India and Maldives established diplomatic relations in 1996.
3. Great Male connectivity project uses renewable energy to build a bridge and causeway link.

Which of the about statements are correct?

- (a) 1 and 2
- (b) 2 and 3

- (c) 3 only
(d) 1 and 3

Answer: (C)

Explanation: The **Maldives is an archipelagic state in South Asia, located in the Indian Ocean.** Positioned southwest of Sri Lanka and India, it is situated about 750 kilometers (470 miles; 400 nautical miles) from the mainland of the Asian continent. **Hence statement 1 is incorrect.**

Situated in the Indian Ocean, the **Maldives is positioned to the south of India's Lakshadweep Islands.** Diplomatic relations between the two nations were established shortly after Maldives gained independence from British rule in 1966, with India being among the first countries to recognize Maldives' independence. **Over the years, India and Maldives have fostered strong ties in strategic, military, economic, and cultural domains. Hence statement 2 is incorrect.** The **Greater Male Connectivity Project entails the construction of a 6.74 km-long bridge and causeway, connecting Male with the neighboring islands of Villingli, Gulhifalhu, and Thilafushi.** Notably, the project incorporates the use of renewable energy. Financed by a USD 100 million grant and a USD 400 million Line of Credit (LOC) from India, this initiative marks the largest project undertaken by India in the Maldives and stands as the most significant infrastructure endeavor in the Maldives to date. **Hence statement 3 is correct.**

69. Consider the following statements about National Food Security Act, 2013:

1. The legislation includes provisions for extending coverage to 75% of the rural population and 50% of the urban population.
2. Pregnant and nursing mothers are eligible for maternity benefits of a minimum of Rs 6000, but the benefits are limited to two female children only.

Which of the above statements are correct?

- (a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (A)

Explanation: The **National Food Security Act, 2013, enacted on September 10, aims to ensure food and nutritional security throughout the human life cycle, providing access to quality food at affordable prices.** The Act covers up to 75% of the rural and 50% of the urban population under the Targeted Public Distribution System, benefiting about two-thirds of the total population. **Hence statement 1 is correct.** Eligible individuals receive 5 kgs of foodgrains per person per month at subsidized prices. The Act prioritizes nutritional support for women and children, offering maternity benefits of at least Rs. 6,000 and

nutritious meals for children up to 14 years. Pregnant women and lactating mothers will be entitled to meals and maternity benefits of not less than Rs 6000. It is however restricted to two children only. **Hence statement 2 is incorrect.**

70. Consider the following water bodies:

1. Persian Gulf
2. Gulf of Aden
3. Arabian Sea
4. Strait of Hormuz
5. Red Sea

Which of the above water bodies form a boundary to Oman?

- (a) 1,2,3
(b) 1,3,4
(c) 2,4,5
(d) 2,3,4

Answer: (B)

Explanation:

Persian Gulf:

- **Location:** The Persian Gulf is to the northwest of Oman.
- **Touches Oman:** Yes, it touches the northern and northwestern parts of Oman.

Gulf of Aden:

- **Location:** The Gulf of Aden is to the southeast of Oman.
- **Touches Oman:** No, it does not touch Oman.

Arabian Sea:

- **Location:** The Arabian Sea is to the southwest of Oman.
- **Touches Oman:** Yes, it touches the southern and southwestern parts of Oman.

Strait of Hormuz:

- **Location:** The Strait of Hormuz is to the northeast of Oman.
- **Touches Oman:** Yes, it touches the northeastern part of Oman.

Red Sea:

- **Location:** The Red Sea is far to the northwest of Oman.
- **Touches Oman:** No, it does not touch Oman.

71. Consider the following statements about bone marrow transplant:

1. Autologous transplants require stem cells from a family member while allogenic transplants use patients own stem cells.
2. Hematopoietic stem cells, essential for blood cell production, reside in both bone marrow and the bloodstream.
3. It is employed for addressing cancers like leukemia, myeloma, and lymphoma, but not blood and immune system disorders.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation:

A **Bone Marrow Transplant (BMT)**, also known as a **stem cell or hematopoietic stem cell transplant**, is a **medical procedure that involves replacing diseased or damaged bone marrow with healthy cells, either from the patient's own body or a donor**. This procedure is primarily utilized in the treatment of cancers such as leukemia, myeloma, and lymphoma, as well as various blood and immune system disorders. **Hence statement 3 is incorrect.**

Stem cells, which have the unique ability to replicate and differentiate into different cell types required by the body, play a crucial role in this process. **Hematopoietic stem cells, specifically important for blood cell production, are situated in the bone marrow and circulate in the bloodstream.** The significance of hematopoietic stem cells becomes evident in the context of cancer and its treatments, which can harm these cells, affecting the production of red and white blood cells, as well as platelets. **Hence statement 2 is correct.**

Red blood cells carry oxygen, white blood cells are integral to the immune system, and platelets contribute to the clotting process. Thus, maintaining the health and functionality of hematopoietic stem cells is essential for overall blood and immune system function. **There are two primary types of transplants in the context of bone marrow procedures. The first is the autologous transplant**, which entails utilizing the patient's own stem cells. These stem cells are collected before undergoing intensive cancer treatment, and following the treatment, they are reintroduced into the patient to restore the immune system and facilitate blood cell production. **On the other hand, the allogenic transplant involves the use of stem cells from a donor.** Typically, this occurs after the patient has undergone chemotherapy or radiation. The success of an allogenic transplant often hinges on finding a suitable donor match, which can include siblings, family members, or unrelated volunteers. This distinction in transplant types allows for tailored approaches to address individual patient needs and circumstances. **Hence statement 1 is incorrect.**

72. Consider the following statements regarding Logistics Ease Across Different State (LEADS) 2023:

1. The report categorizes Indian states and UTs into four segments.
2. In the North-East Group, Assam, Sikkim, and Tripura are acknowledged as Achievers

Which of the statements is/are correct?

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation:

- States' performance shows a positive shift as indicated by LEADS 2023 across crucial pillars: **Logistics Infrastructure, Logistics Services, and Operating and Regulatory Environment**. The report furnishes region-specific insights to facilitate informed decision-making and foster comprehensive growth.
 - **Key highlights from LEADS 2023 include notable performance distinctions among state groups:**
 - **Coastal Group:**
 - **Achievers:** Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu.
 - **Fast Movers:** Kerala, Maharashtra.
 - **Aspirers:** Goa, Odisha, West Bengal.
 - **Landlocked Group:**
 - **Achievers:** Haryana, Punjab, Telangana, Uttar Pradesh.
 - **Fast Movers:** Madhya Pradesh, Rajasthan, Uttarakhand.
 - **Aspirers:** Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand.
 - **North-East Group:**
 - **Achievers:** Assam, Sikkim, Tripura. Hence statement 2 is correct.
 - **Fast Movers:** Arunachal Pradesh, Nagaland.
 - **Aspirers:** Manipur, Meghalaya, Mizoram.
 - **Union Territories:**
 - **Achievers:** Chandigarh, Delhi.
 - **Fast Movers:** Andaman & Nicobar, Lakshadweep, Puducherry.
 - **Aspirers:** Daman & Diu/Dadra & Nagar Haveli, Jammu & Kashmir, Ladakh.
- Hence statement 1 is correct.**

73. Consider the following statements regarding somatic gene editing therapy:

1. Somatic gene editing therapy modifies a patient's DNA to address diseases caused by genetic mutations.
2. Unlike germline gene editing, somatic gene editing ensures that the edited gene is passed on to future generations.
3. This technique is effective in treating disorders related to defective blood cells.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Somatic gene therapies are designed to modify a patient's DNA for the treatment or cure of

diseases caused by genetic mutations. In a specific clinical trial, scientists extract blood stem cells from a patient, use CRISPR techniques to rectify the genetic mutation responsible for the production of defective blood cells, and then reintroduce the corrected cells into the patient. This process results in the production of healthy hemoglobin, thereby transforming the patient's blood cells. **Hence statements 1 and 3 are correct.** It's important to note that this treatment only impacts the patient's blood cells and not their sperm or eggs. In contrast, **germline human genome editing operates by altering the genome of a human embryo during its earliest stages and moves on to next generations.** **Hence statement 2 is incorrect.** This intervention has the potential to affect every cell, not only influencing the individual who emerges from the edited embryo but potentially impacting future generations. Due to these far-reaching consequences, there are significant restrictions on the use of germline human genome editing to ensure ethical and safety considerations are upheld.

74. Consider the following Sikh Gurus:

1. Guru Amar Das
2. Guru Hargobind
3. Guru Ram Das
4. Guru Har Krishan

Arrange the above Gurus chronologically.

- (a) 1, 3, 2, 4
- (b) 2, 1, 3, 4
- (c) 1, 4, 3, 2
- (d) 2, 3, 4, 1

Answer: (A)

Explanation:

1. **Guru Nanak (1469-1539):**
The **founder of Sikhism**, Guru Nanak, born in 1469, preached equality and truth, rejecting labels of Hindu or Muslim. His travels across India and the Middle East aimed at denouncing religious rituals and the caste system.
2. **Guru Angad (1504-1552):**
As the second Sikh guru, Guru Angad, born in 1504, created **Gurmukhi**, fostered education, and introduced Mall Akhara, focusing on physical and spiritual exercise.
3. **Guru Amar Das (1479-1574):**
Born in 1479, Guru Amar Das fought caste prejudice, championed equality, and introduced the 'free kitchen' concept. He **pioneered Anand Karaj, a special marriage ceremony.**
4. **Guru Ram Das (1534-1581):**
Guru Ram Das, born in 1534, founded Amritsar and **initiated the construction of the Golden Temple**, promoting inclusivity with its four doors.
5. **Guru Arjan (1563-1606):**
Guru Arjan, born in 1563, **compiled the Adi Granth,**

completed the Golden Temple construction, and faced execution for conspiracy against Jahangir.

6. **Guru Hargobind (1595-1644):**
Known as the '**soldier saint**,' Guru Hargobind, born in 1595, advocated armed defense and organized a small army.
7. **Guru Har Rai (1630-1661):**
Born in 1630, Guru Har Rai focused on missionary work, meditation, and maintained the army created by his grandfather, Guru Hargobind.
8. **Guru Har Krishan (1656-1664):**
Guru Har Krishan, born in 1656, became a guru at five, helping during a smallpox epidemic and succumbing to the disease before turning eight.
9. **Guru Tegh Bahadur (1621-1675):**
Guru Tegh Bahadur, born in 1621, defended freedom of worship, resisted forced conversions, and was executed for refusing to convert to Islam.
10. **Guru Gobind Singh (1666-1708):**
The last human Sikh guru, **Guru Gobind Singh, born in 1666, introduced the Khalsa, the 'five Ks,' and proclaimed Guru Granth Sahib as the future guru** before his death in 1708. Guru Granth Sahib is revered as the 11th Sikh Guru.

75. Consider the description:

"The concept often translated as the "awakening mind" or "thought of enlightenment" holds a central place in Mahayana Buddhism teachings. This guiding principle directs practitioners toward a compassionate path characterized by altruism and selflessness. This commitment involves embarking on a journey of awakening and adopting the role of a bodhisattva, someone wholly devoted to the liberation of all beings. Within this framework, two distinct types of this commitment exist: conventional and ultimate."

The above paragraph describes which of them best?

- (a) Parinirvana
- (b) Bodhisattva
- (c) Bodhicitta
- (d) Mahavihara

Answer: (C)

Explanation:

Within Mahayana Buddhism, the term bodhicitta, translating to "enlightenment-mind" or "the thought of awakening," refers to the mind directed towards awakening, characterized by wisdom and compassion for the well-being of all sentient beings. **Bodhicitta is the defining attribute of a Mahayana bodhisattva, an individual dedicated to achieving Buddhahood, and the act of cultivating bodhicitta marks one as a bodhisattva.** The Daśabhūmika Sūtra asserts that the emergence of bodhicitta is the initial stage in the journey of a bodhisattva. Various Mahayana Buddhist sources offer different interpretations of bodhicitta. Paul Williams describes it as a profound motivation to "strive

for the complete cessation of suffering for oneself and others," arising from deep compassion. According to the Bodhisattvabhumi, the bodhisattva generating bodhicitta aspires to attain supreme Enlightenment, benefit all beings, and guide them to final nirvana and Buddha-knowledge.

76. With reference to National Green Tribunal, consider the following statements:

1. The National Green Tribunal (NGT) is a specialized judicial body that handles environmental disputes in India.
2. It was established on October 18, 2010, under the National Green Tribunal Act of 2010.
3. NGT is mandated to make disposal of applications or appeals finally within 6 months of filing of the same.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation:

Recently, the Southern Bench of National Green Tribunal queried the Tamil Nadu government and Chennai Petroleum Corporation Limited about an oil spill in Pulicat backwaters. **The National Green Tribunal (NGT) is a specialized judicial body that handles environmental disputes in India. It was established on October 18, 2010, under the National Green Tribunal Act of 2010.** It deals with civil cases related to environmental protection, forest conservation and other natural resources. It comprises a Chairperson, Judicial Members and Expert Members, all of whom serve a nonrenewable 5-year term. The Chairperson is appointed by the Central Government in consultation with the Chief Justice of India, while a Selection Committee is responsible for the appointment of Judicial and Expert Members. **Hence, all statements are correct.**

77. Consider the following passage:

It is a gravity dam located in Idukki district of Kerala. It was built in 1895 by the British administration and is the first dam in Kerala. However, the dam is operated and maintained by the Tamil Nadu for meeting the requirements of five (Theni, Madurai, Sivaganga, Dindigul and Ramnad) of its southern districts. The dam is entirely in Kerala but was given on lease to Tamil Nadu on October 29, 1886 for 999 years. According to a 999-year lease agreement made during the British rule the operational rights were handed over to Tamil Nadu

The above passage is related to which of the following dam?

- (a) Mullaperiyar Dam
- (b) Idukki Dam

- (c) Malampuzha Dam
- (d) Banasura Sagar Dam

Answer: (A)

Explanation: Recently, the water level at Mullaperiyar dam hit 138.05 feet, prompting the decision is to open its spillway shutters today. **Mullaperiyar dam is a gravity dam located on the confluence of the Mullayar and Periyar rivers in Idukki district of Kerala.** It was built in 1895 by the British administration and is the first dam in Kerala. However, the dam is operated and maintained by the Tamil Nadu for meeting the requirements of **five (Theni, Madurai, Sivaganga, Dindigul and Ramnad) of its southern districts.** **The dam is entirely in Kerala but was given on lease to Tamil Nadu on October 29, 1886 for 999 years.** According to a 999-year lease agreement made during the British rule the operational rights were handed over to Tamil Nadu. **Hence, option (a) is correct**

78. JN.1 recently seen in news is related to which of the following?

- (a) A newly discovered nanoparticle
- (b) Satellite of Saturn
- (c) Vaccine for Hepatitis B
- (d) A sub-variant of COVID-19

Answer: (D)

Explanation: The detection of the JN.1 sub-variant of COVID-19 in Kerala has triggered several responses and concerns. **The JN.1 sub-variant, currently spreading in the US and China was identified in Kerala through routine surveillance by INSACOG (Indian SARS-CoV-2 Genomics Consortium).** JN.1 is derived from the BA.2.86 (Pirola) variant and was first identified in the United States in September. It possesses one additional mutation on the spike protein compared to Pirola, which is critical for viral cell entry. Both Pirola and JN.1 were effectively neutralized by serum from previously infected or vaccinated individuals, as per WHO assessments. Symptoms associated with JN.1 are similar to those caused by previous strains of the virus, including fever, runny nose, sore throat, headache and mild gastrointestinal symptoms such as abdominal pain and diarrhoea. **Hence, option (d) is correct.**

79. Consider the following statements regarding Solar Prominence:

1. Solar prominences are large, loop-like structures visible on the edge of the solar disk against the dark background of space.
2. They are hotter and denser than the surrounding plasma in the Sun's corona and are shaped by the Sun's magnetic field.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only

- (c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (A)

Explanation: Solar prominences are large, loop-like structures visible on the edge of the solar disk against the dark background of space. They are anchored to the Sun's surface in the photosphere and extend into the corona. They are cooler and denser than the surrounding plasma in the Sun's corona and are shaped by the Sun's magnetic field. Prominences can extend for thousands of kilometers and can last for several days or up to several months. Some prominences erupt and give rise to coronal mass ejections (CMEs). **Hence, statement 2 is not correct.**

80. Consider the following statements regarding Telecom Bill 2023:

1. The Telecommunications Bill, 2023 aims to amend and consolidate laws related to the development, expansion, and operation of telecommunication services and networks, spectrum assignment, and related matters.
2. It replaces the Indian Telegraph Act, 1885, the Indian Wireless Telegraphy Act, 1933, and the Telegraph Wires (Unlawful Possession) Act, 1950.
3. The Bill grants the government the authority to take permanent control of telecom services and intercept messages in the interest of national security and during emergencies.

How many of the above statements is/are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)

Explanation: Union minister for Communications, Electronics & Information Technology Ashwini Vaishnav presented the Telecommunications Bill, 2023 in the Lok Sabha. **The Telecommunications Bill, 2023 aims to amend and consolidate laws related to the development, expansion, and operation of telecommunication services and networks, spectrum assignment, and related matters.** It replaces the Indian Telegraph Act, 1885, the Indian Wireless Telegraphy Act, 1933, and the Telegraph Wires (Unlawful Possession) Act, 1950. **The statement of objectives and reasons highlights the telecommunications sector's role in economic and social development, serving as a gateway to digital services.** The Bill grants the government the authority to take temporary control of telecom services and intercept messages in the interest of national security and during emergencies. In cases of public emergencies or disaster management, the Central or State Government, or authorized officers, can, by notification, take possession of telecommunication services or networks from authorized entities. The Bill

allows for the interception, detention, or non-transmission of messages during public emergencies or for public safety, safeguarding the sovereignty, integrity, defense, and security of the state. **Hence, statement 3 is not correct.**

81. Consider the following statements with reference to Lumpy Skin Disease:

1. Lumpy skin disease (LSD) is a bacterial disease that affects cattle and water buffalo.
2. Animals infected by LSD immediately start losing weight and may have fever and lesions in the mouth.
3. LSD is zoonotic meaning the disease can spread to humans.

How many of the above statements is/are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)

Explanation:

Recently, the Parliamentary Committee questioned the accuracy of the Union Animal Husbandry Ministry's data on the deaths of over two lakh cattle and buffaloes due to lumpy skin disease in 2022 and 2023. **Lumpy skin disease (LSD) is a viral disease that affects cattle and water buffalo. It is caused by the lumpy skin disease virus (LSDV), which is a member of the Poxviridae family. Hence, statement 1 is not correct. LSD infects cattle and water buffalo mainly through vectors such as blood-feeding insects.** Signs of infection include the appearance of circular, firm nodes on the animal's hide or skin that look similar to lumps. Infected animals immediately start losing weight and may have fever and lesions in the mouth, along with a reduced milk yield. Other symptoms include excessive nasal and salivary secretion. Pregnant cows and buffaloes often suffer miscarriage and, in some cases, diseased animals can die due to it as well. **Hence, statement 2 is correct. LSDV is not a zoonotic virus, meaning the disease cannot spread to humans.** This skin disease is transmitted by blood-feeding insects, such as certain species of flies and mosquitoes or ticks. It is characterized by fever, nodules on the skin, mucous membranes and internal organs, emaciation, enlarged lymph nodes and sometimes death. **The first case of LSD in India was reported in Gujarat in May 2022. There is no treatment for the virus, so prevention by vaccination is the most effective means of control. Hence, statement 3 is not correct.**

82. Consider the following statements regarding Large Magellanic Cloud:

1. The Large Magellanic Cloud (LMC) is an irregular satellite galaxy that orbits the Milky Way every 1,500 million years.

2. It is about 163,000 light-years away from the earth and is visible to the naked eye in the Southern Hemisphere.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: The Large Magellanic Cloud (LMC) is an irregular satellite galaxy that orbits the Milky Way every 1,500 million years. It is **one of the closest galaxies to Earth**. It is about 163,000 light-years away from the earth and is visible to the naked eye in the Southern Hemisphere. **The LMC and the Small Magellanic Cloud (SMC) are two irregular galaxies that orbit the Milky Way. The Magellanic Clouds share a gaseous envelope and lie about 22° apart in the sky near the south celestial pole.** The LMC is rich in dark matter, which makes its mass considerably larger. The interaction of the LMC with the Milky Way is creating new stars. **The Magellanic Clouds are named after the Portuguese explorer Ferdinand Magellan, who observed them during his voyage. Hence, both statements are correct.**

83. Consider the following statements regarding Photoreception:

Statement I - Photoreception is the biological process by which photoreceptors in the eye detect and convert light into electrical signals that the brain interprets as vision.

Statement II - Photoreceptors are specialized cells in the pupil that absorb light waves and convert them into electrical signals.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Answer: (C)

Explanation: Photoreception is the biological process by which photoreceptors in the eye detect and convert light into electrical signals that the brain interprets as vision. **Photoreceptors are specialized cells in the retina that absorb light waves and convert them into electrical signals. There are two types of photoreceptors, Rods and Cones.** Rods detect dim light (scotopic vision) and are used for night vision while cones mediate daylight vision and color perception (photopic vision). Humans have three distinct color-

sensing cones—for red, green and blue light. Diurnal creatures have cone-rich retinas for clear daylight vision, while nocturnal animals use rod cells and rhodopsin for better low-light sight. **Hence, Statement-I is correct but Statement-II is incorrect.**

84. Consider the following passage:

This Sanctuary was established in 1973 and is located in Kerala. The sanctuary is a component of the Nilgiri Biosphere Reserve (UNESCO-designated area) and of the Elephant Reserve No. 7 of South India. It is situated at the confluence of three biologically distinct and diverse regions- the main Western Ghat Mountains, the Nilgiri Hills and the Deccan Plateau. Kabini River, a tributary of the Kaveri River flows through the sanctuary.

The above passage is related to which of the following Sanctuary?

- (a) Periyar Wildlife Sanctuary
- (b) Idukki Wildlife Sanctuary
- (c) Chinnar Wildlife Sanctuary
- (d) Wayanad Wildlife Sanctuary

Answer: (D)

Explanation: Recently, the South Wayanad Forest Division officials shifted a 13-year-old male tiger from Wayanad Wildlife Sanctuary to a quarantine facility at Puthur Zoological Park in Thrissur for safety. **The Wayanad Wildlife Sanctuary was established in 1973 and is located in Kerala's Wayanad district. The sanctuary is a component of the Nilgiri Biosphere Reserve (UNESCO-designated area) and of the Elephant Reserve No. 7 of South India.** It covers the Wayanad Plateau, situated at the confluence of three biologically distinct and diverse regions- the main Western Ghat Mountains, the Nilgiri Hills and the Deccan Plateau. Kabini River, a tributary of the Kaveri River flows through the sanctuary. The flora consists of moist deciduous forests, West coast semi-evergreen forests, and teak, eucalyptus, and Grewelia plantations. The fauna includes Elephant, Gaur, Tiger, Panther, Sambar, Spotted deer, Barking deer, Wild boar, Sloth bear, Nilgiri langur and more. **Hence, option (d) is correct.**

85. Consider the following countries:

- 1. Egypt
- 2. Djibouti
- 3. Jordan
- 4. Eritrea
- 5. Turkey

How many of the above countries border the Red Sea?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

Answer: (B)

Explanation: Red Sea is an inlet of the Indian Ocean between Africa and Asia and is one of the most saline bodies of water in the world. Six countries border the Red Sea namely Egypt, Saudi Arabia, Yemen, Sudan, Eritrea, and Djibouti. **The Red Sea, a vital shipping route, connects the Mediterranean Sea with the Indian Ocean. Hence, option (b) is correct.**

86. With reference to James Webb Space Telescope, consider the following statements:

1. The telescope is the result of an international collaboration between NASA and ROSCOSMOS.
2. It is currently at a point in space known as the Sun-Earth L2 Lagrange point, approximately 1.5 million km beyond Earth's orbit around the Sun.
3. It will examine every phase of cosmic history from the Big Bang to the formation of galaxies, stars, and planets to the evolution of our own Solar System.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation:

Recently, the NASA has unveiled an image of the Christmas Tree Galaxy Cluster, situated 4.3 billion light-years away, captured by the James Webb Space Telescope. **The Christmas Tree Galaxy Cluster is a composite image that combines visible light from Hubble and infrared light from James Webb Space Telescope.** The image shows the MACS0416 galaxy cluster, which is about 4.3 billion light-years from Earth. **James Webb Space Telescope is the result of an international collaboration between NASA, the European Space Agency (ESA) and the Canadian Space Agency which was launched in December 2021. Hence, statement 1 is not correct.** It is currently at a point in space known as the Sun-Earth L2 Lagrange point, approximately 1.5 million km beyond Earth's orbit around the Sun. **The Lagrange Point 2 is one of the five points in the orbital plane of the Earth-Sun system. Hence, statement 2 is correct.** It's the largest, most powerful infrared space telescope ever built. It's the successor to Hubble Telescope. It can see backwards in time to just after the Big Bang by looking for galaxies that are so far away that the light has taken many billions of years to get from those galaxies to our telescopes. It will examine every phase of cosmic history from the Big Bang to the formation of galaxies, stars, and planets to the evolution of our own Solar System. **Hence, statement 3 is correct.**

87. Consider the following statements regarding Greenwashing:

Statement I - Greenwashing is the process of conveying a false impression or misleading information about how a company's products are environmentally sound.
Statement II - Greenwashing can degrade customer satisfaction, erode brand loyalty and potentially affect repeat purchases.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Answer: (B)

Explanation: The term greenwashing was first used in 1986 by Jay Westerveld, an American environmentalist and researcher. **Greenwashing is the practice in which firms and governments mark all kinds of activities as climate-friendly, as something that would lead to emissions reduction, or avoidance of emissions.** Developed countries are often accused of greenwashing their normal business investments in developing countries by highlighting climate co-benefits of the financial flows, sometimes with very little justification. Greenwashing can degrade customer satisfaction, erode brand loyalty and potentially affect repeat purchases. **Several multinational corporations, including oil giants like Shell and BP, and Coca Cola have faced accusations of greenwashing. Hence, both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I.**

88. Consider the following statements regarding Punaura Dham Temple:

1. Punaura Dham is a Hindu pilgrimage temple in the Bhadohi district of Uttar Pradesh.
2. The destination of Punaura Dham has been recently included under PRASHAD Scheme of the Ministry of Tourism.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: Bihar Chief Minister Nitish Kumar recently launched a Rs 72-crore development plan for Goddess Sita's birthplace at Punaura Dham in Sitamarhi. **Punaura Dham is a Hindu pilgrimage temple in the Sitamarhi district of Bihar. Hence, statement 1 is not correct.** The destination of Punaura Dham has been recently included under PRASHAD Scheme of the Ministry of

Tourism. Punaura Dham, considered to be the birthplace of Hindu Goddess Sita. The shrine compound has a Ram Janki temple, a pond called Sita Kund and a hall. **Hence, statement 2 is correct.**

89. Consider the following passage:

This tiger reserve is located at the India-Nepal border on the bank of river Gandak. It is situated in the Gangetic Plains bio-geographic zone of the country. It forms the easternmost limit of the Himalayan Terai forests in India. It includes rich flora like, Sal, rohini, sihor, teak, bamboo, semal, Mandar, shisham, Jamun, Gular, and various other species. This reserve hosts tigers, leopards, smaller cats, deer species, wild boar and unique birds like Kaleej Pheasant, hill myna, paradise fly catcher, and Himalayan bulbul.

The above passage is related to which of the following tiger reserve?

- (a) Valmiki Tiger Reserve
- (b) Corbett Tiger Reserve
- (c) Dudhwa Tiger Reserve
- (d) Rajaji Tiger Reserve

Answer: (A)

Explanation: Recently, the authorities in Bihar's Valmiki Tiger Reserve have credited the rise in the protected area (PA)'s big cat numbers to a reduction in human activities, including restrictions on illegal mining in its eco-sensitive zone. **Valmiki tiger reserve is located at the India -Nepal border in the West Champaran district of Bihar.** It is bordered by Nepal's Royal Chitwan National Park in the north and the Gandak River in the west, it encompasses Valmiki National Park and Valmiki Wildlife Sanctuary. It includes rich flora like, Sal, rohini, sihor, teak, bamboo, semal, Mandar, shisham, Jamun, Gular, and various other species. This reserve hosts tigers, leopards, smaller cats, deer species, wild boar and unique birds like Kaleej Pheasant, hill myna, paradise fly catcher, and Himalayan bulbul. As per the Tiger Census of 2018, the reserve is home to 32 tigers. **Hence, option (a) is correct.**

90. Consider the following statements regarding Tempo Satellite:

1. It is NASA's first Earth-observation satellite in geostationary orbit.
2. It will allow scientists to monitor air pollutants and their emission sources from space more comprehensively than ever before.
3. TEMPO is a space-based ultraviolet-visible spectrometer designed to monitor air pollution across greater North America.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two

- (c) All three
- (d) None

Answer: (C)

Explanation: NASA's new satellite to hourly measure air pollution hourly has shown significant progress and now the space agency officials are already thinking about ways to extend its life. TEMPO is NASA's first Earth-observation satellite in geostationary orbit and has developed further from previous polar-orbiting satellites provided daily observations to provide 10 to 12 daily scans. **TEMPO is a space-based ultraviolet-visible spectrometer designed to monitor air pollution across greater North America.** It provides high-resolution, hourly data on atmospheric pollutants like ozone, nitrogen dioxide, and formaldehyde. **Hence, all statements are correct.**

91. With reference to Wildlife Trust of India (WTI), consider the following statements:

1. It is an attached office under Ministry of Forest and Climate Change (MoEFCC).
2. WTI was founded in November 1995 in New Delhi, in response to the rapidly deteriorating state of wildlife in India.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (D)

Explanation:

The Wildlife Trust of India (WTI) is a non-profit conservation organisation dedicated to safeguarding India's natural heritage. **WTI is a registered charity in India (under Section 12A of the Income Tax Act, 1961). WTI was founded in November 1998 in New Delhi, in response to the rapidly deteriorating state of wildlife in India.** WTI uses more than 80% of the funds raised directly for Conservation Action. **A team of 3 members set out on a mission to save the environment which has now increased to 150 full time professionals.** They work on a variety of projects ranging from species rehabilitation to the prevention of illegal wildlife trade. It handles wildlife emergencies, aids law enforcement against wildlife crime, preserves habitats, raises conservation awareness, promotes green livelihoods and assists grassroots conservation. **Hence, both statements are not correct.**

92. Consider the following statements regarding R21/MatrixM Vaccine:

1. It is a new vaccine approved by WHO for the prevention of malaria in children.
2. This vaccine is administered orally, rather than by injection.

3. The R21 vaccine is the second malaria vaccine recommended by the WHO, following the RTS,S/AS01 vaccine, which received a WHO recommendation in 2021.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Recently, the World Health Organization (WHO) added the R21/MatrixM malaria vaccine, developed by Oxford University and manufactured by Serum Institute of India, to its list of prequalified vaccines. **The R21/Matrix-M vaccine is a malaria vaccine recommended by the World Health Organization (WHO) to protect children from malaria in at-risk countries.** The vaccine targets the first form of the malaria parasite to enter the body after a person is bitten by an infected mosquito. **Hence, statement 1 is correct.**

The vaccine is not administered orally, but rather through intramuscular injection. It is the first malaria vaccine to reach the WHO's target of 75% efficacy. **Hence, statement 2 is not correct.** The R21 vaccine is the second malaria vaccine recommended by the WHO, following the RTS,S/AS01 vaccine, which received a WHO recommendation in 2021. **Hence, statement 3 is correct.**

93. Consider the following statements, with reference to Namdapha Flying Squirrel:

1. The Namdapha flying squirrel is a nocturnal and arboreal flying squirrel that is endemic to Arunachal Pradesh.
2. It is listed as endangered by the IUCN.
3. It is hunted for medicines, not for food.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Recently, the Namdapha Flying Squirrel has been found resurfaces in Arunachal Pradesh (Rediscovery after 42 Years). **The Namdapha flying squirrel (Biswamoyopterus Biswasi) is a nocturnal and arboreal flying squirrel that is endemic to Arunachal Pradesh.** The species is known from a single specimen collected in Nam dapha National Park in 1981. **Hence, statement 1 is correct.** It is listed as critically endangered by the IUCN. **It is among the 25 "most wanted lost" species that are the focus of Global Wildlife Conservation's "Search for Lost**

Species" initiative. Hence, statement 2 is not correct.

The Namdapha Flying Squirrel is not hunted specifically for medicines. It is primarily hunted for its meat, which is considered a delicacy by the local tribes residing in the region. The hunting of this squirrel for food poses a threat to its population and conservation efforts, as it is a species of conservation concern. **Hence, statement 3 is correct.**

94. Consider the following statements regarding The Press and Registration of Periodicals (PRP) Bill 2023:

1. This Bill seeks to replace the existing Press and Registration of Books (PRB) Act 1867, which governs the registration of print and publishing industry in the country.
2. The Bill will make it mandatory for digital news platforms to do a "one-time registration" in order to operate.
3. It prohibits any person who has been convicted of a terrorist act, an unlawful activity, or anything against the security of the state from bringing out a periodical.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: The Union Information and Broadcasting (I&B) Minister introduced the Press and Registration of Periodicals (PRP) Bill 2023 in the Rajya Sabha. The Bill seeks to replace the existing Press and Registration of Books (PRB) Act 1867, which governs the registration of print and publishing industry in the country. The Bill seeks to simplify the registration process for periodicals. **The Bill will make it mandatory for digital news platforms to do a "one-time registration" in order to operate.** The Bill empowers the PRG to suspend/cancel registration. As per the new Bill, a person who has been convicted by any court for an offence involving terrorist act or unlawful activity or having done anything against the security of the state shall not be permitted to bring out a periodical. **The Bill also seeks to do away with two provisions that required publishers and printers to file a declaration before the DM.** Only an online intimation has to be filed before PRG and DM. It aims to bring transparency and ease of doing business by providing for a simple process that will help small and medium publishers. **It brings digital news media under its purview, which is expected to weed out apps, websites and social media accounts spreading fake news. Hence, all statements are correct.**

95. Consider the following passage:

He was a freedom fighter who actively fought against the British forces. He helped in the formation of Hindustan Republican Association (later, Hindustan

Socialist Republican Association) in 1924 to organize an armed revolution to achieve freedom. He was a poet who wrote under the pen names of Hasrat and Warsi. He was arrested for his involvement in Kakori Train Robbery and sentenced to death.

The above passage is related to which of the following personality?

- (a) Ashfaqulla Khan
- (b) Ram Prasad Bismil
- (c) Sachindranath Sanyal
- (d) Sachindra Nath Bakshi

Answer: (A)

Explanation: Ashfaqulla Khan (1900 – 1927) born in Shahjahanpur, Uttar Pradesh. He was a freedom fighter who actively fought against the British forces. He **helped in the formation of Hindustan Republican Association (later, Hindustan Socialist Republican Association) in 1924 to organize an armed revolution to achieve freedom.** He was a poet who wrote under the pen names of Hasrat and Warsi. He was arrested for his involvement in Kakori Train Robbery and sentenced to death. **Hence, option (a) is correct.**

96. Consider the following pairs:

Term	Meaning
1. Adjournment	An adjournment terminates a sitting of the House.
2. Summoning	Summoning terminates the life of the house.
3. Dissolution	Dissolution means the end of a session.
4. Prorogation	Prorogation is the process of calling all members of the Parliament to meet.

How many of the above pairs are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs

Answer: (A)

Explanation:

- **Summoning of Parliament is a crucial process where the President calls all members of both Houses to convene.** The Constitution mandates that the Parliament must meet at least twice a year, with no gap between two sessions exceeding six months. The President holds the authority to summon each House of Parliament, ensuring regular legislative activities.
- **Adjournment is a mechanism employed during a sitting to temporarily halt proceedings, with the House reconvening at the specified time for the**

next sitting. The duration of adjournment can vary, ranging from a few hours to days or weeks. If adjournment occurs without a specified timeframe, it is termed as adjournment sine die, a power solely vested in the presiding officer of the House.

- **Prorogation marks the conclusion of a session without dissolving the House. The President can prorogue the House even while in session, typically issuing a notice a few days after the House is adjourned sine die.** During prorogation, all pending notices lapse, but bills remain unaffected. The period between prorogation and reassembly is termed as recess.
- **Dissolution is the termination of the Lok Sabha's life, either automatically at the end of its five-year term or by presidential order.** The President, upon the Council of Ministers' authorization, can order dissolution before the completion of the five-year term. Dissolution results in the lapse of all pending business, and the last session before dissolution is referred to as a **Lame Duck session.** Only the President possesses the authority to dissolve the Lok Sabha, while the Rajya Sabha remains a permanent House, not subject to dissolution.

97. In the context of mob lynching, when does the Bharatiya Nyaya Sanhita apply?

- (a) When three or more individuals commit murder
- (b) When a mob of five or more individuals commits murder based on specific factors
- (c) When any act of violence occurs in a public place
- (d) When political leaders are involved in violent incidents

Answer: (B)

Explanation: The **provisions of the Bharatiya Nyaya Sanhita (BNS) define offenses related to mob lynching and hate-crime murders, specifically when a group of five or more individuals commits murder based on factors such as race, caste, community, or personal belief.** The punishment for such offenses ranges from life imprisonment to the death penalty. Initially, the Bill had proposed a minimum sentence of seven years, but it was later aligned with the punishment for murder. In 2018, the Supreme Court had urged the government to consider a separate law to address the issue of lynching. **Indian Penal Code (IPC) did not explicitly contain a specific law addressing the offense of mob lynching.** The IPC, which was enacted in 1860, primarily covers a wide range of criminal offenses, but the term "mob lynching" or a specific provision addressing this form of violence was not present in the original text. Cases of mob lynching were often prosecuted under existing provisions of the IPC, such as those related to murder, rioting, unlawful assembly, and other relevant sections based on the circumstances of the incident. The absence of a specific law addressing mob lynching led to calls for legal reforms to more effectively address and deter such incidents.

98. Consider the following statements about Credit rating agencies:

1. A credit rating is an evaluation of the general creditworthiness of a lender.
2. Credit Rating Agencies (CRAs) in India are governed by the SEBI (Credit Rating Agencies) Regulations, 1999, under the Securities and Exchange Board of India Act, 1992.
3. CARE Ratings is supported by Canara Bank, Unit Trust of India (UTI), Industrial Development Bank of India (IDBI), and other financial and lending institutions.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: A credit rating involves assessing the creditworthiness of a borrower in a general context or in relation to a specific financial obligation. This evaluation is applicable to various entities seeking to borrow funds, including individuals, corporations, state or provincial authorities, and sovereign governments. The assessment of an instrument's creditworthiness encompasses both qualitative and quantitative analyses, making credit rating a complex process that goes beyond a simple mathematical calculation. **Credit Rating Agencies (CRAs) are organizations tasked with rating debtors based on their capacity to repay interests and loan amounts punctually, as well as the likelihood of default.** CRAs play a crucial role by offering independent research-based opinions on the issuer's ability and willingness to fulfill debt service obligations, essentially assigning a probability of default to a particular instrument.

In India, the establishment of credit rating agencies dates back to the latter part of the 1980s. **The regulation of CRAs in the country falls under the SEBI (Credit Rating Agencies) Regulations, 1999, as stipulated by the Securities and Exchange Board of India Act, 1992.**

CARE Ratings

- Established in 1993, **Credit Analysis and Research Limited Ratings (CARE Ratings) is a credit rating company.**
- It receives support from Canara Bank, Unit Trust of India (UTI), Industrial Development Bank of India (IDBI), and various other financial institutions.
- **CARE Ratings is recognized as the second-largest credit rating company in India.**
- The company is **headquartered in Mumbai.**

99. Consider the following statements:

1. It is located in the Eastern Pacific Ocean.
2. It is not a member of Commonwealth of Nations.
3. It is the world's third largest island country.

Which country are the above statements for?

- (a) Brunei
- (b) Indonesia
- (c) Papua New Guinea
- (d) Australia

Answer: (C)

Explanation: Papua New Guinea (PNG) is a country in Oceania, situated in the southwestern Pacific Ocean, north of Australia. It makes up the eastern part of the island of New Guinea and includes nearby islands in Melanesia. Officially known as the Independent State of Papua New Guinea, it shares a border with Indonesia to the west and is close to Australia to the south and the Solomon Islands to the east. The capital is Port Moresby, located on the southeastern coast. **Papua New Guinea is the world's third-largest island country,** covering an area of 462,840 square kilometers (178,700 square miles).

Papua New Guinea is part of the Commonwealth with Charles III serving as the King of Papua New Guinea.

When the draft constitution was prepared by the constitutional convention and Australia, who was the outgoing metropolitan power, there was an expectation that Papua New Guinea would not retain a monarchy. However, the founders decided to keep imperial honors as they were deemed prestigious. The monarch is represented by the Governor-General of Papua New Guinea, presently Bob Dadae. Notably, Papua New Guinea, along with the Solomon Islands, differs from other Commonwealth realms in that governors-general are appointed by the Sovereign, the Head of State, based on the nomination by the National Parliament. Importantly, the Head of State is not obligated to accept this nomination.

100. Which of the following institutions releases the Global Financial Stability Report?

- (a) World Bank
- (b) IMF
- (c) Basel Committee on Banking Supervision
- (d) OECD

Answer: (B)

Explanation: The Global Financial Stability Report provides a comprehensive overview of the current state of the global financial system and markets. It delves into emerging market financing within a global context, offering insights into ongoing market scenarios and emphasizing systemic challenges that pose risks to financial stability. Additionally, **the report addresses sustained market access by emerging market borrowers and sheds light on the financial consequences of economic imbalances, echoing concerns raised in the World Economic Outlook Report by the International Monetary Fund (IMF).** The report encompasses various elements, including features,

analytical chapters, and essays that explore structural or systemic issues, ultimately offering recommendations aimed at promoting international financial stability.

101. Consider the following statements regarding Aerogel Fibre:

1. Aerogel fiber is a new type of functional clothing fiber with excellent thermal insulation, moisture absorption and breathability.
2. It has unique properties, such as low porosity, high density and low thermal conductivity.
3. It can provide protection against the cold with only a fraction of the thickness required for conventional sweaters or down jackets.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Recently, the researchers have developed knittable aerogel fiber based on polar bear fur structure. **Aerogel fiber is a new type of functional clothing fiber with excellent thermal insulation, moisture absorption and breathability.** It has unique properties, such as high porosity, low density and low thermal conductivity. It is an ideal material for thermal insulation. **The fiber has exceptional thermal and mechanical properties and is washable, dyeable and durable. It is also suitable for knitting or weaving.** The fiber is made using aerogel, a thermal insulation material that's mainly used in the aerospace industry. The resulting fiber is ultralight and coated with polyurethane. It can protect wearers from the cold at a fraction of the thickness needed for conventional sweaters or down jackets. **Hence, statement 2 is not correct.**

102. Consider the following statements regarding Microbiome:

1. Microbiome refers to the collection of bacteria, fungi, viruses, algae, protozoa and viruses present in a particular location, such as the human eye.
2. Microbes are so small that they can only be seen with a microscope, but they contribute significantly to human health and wellness.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Microbiome refers to the collection of bacteria, fungi, viruses, algae, protozoa and viruses present in a particular location, such as the human eye.

The microbiome is a collection of microorganisms that live in a particular environment. Microbes are so small that they can only be seen with a microscope, but they contribute significantly to human health and wellness.

In humans, the microbiome is often used to describe the microorganisms that live in or on a specific part of the body, such as the skin or gastrointestinal tract. The human body contains around 39 trillion bacteria. **Hence, both statements are correct.**

103. Consider the following pairs:

1. Bab-el-Mandeb Strait	Red Sea and Gulf of Aden
2. Yucatan Strait	Gulf of Mexico and Caribbean Sea
3. Bosporous Strait	Marmara Sea and Aegean Sea
4. Gibraltar Strait	Mediterranean Sea and Pacific Ocean

How many of the above pairs are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs

Answer: (B)

Explanation:

1. Bab-el-Mandeb Strait	Red Sea and Gulf of Aden
2. Yucatan Strait	Gulf of Mexico and Caribbean Sea
3. Bosporous Strait	Black Sea and Marmara Sea
4. Gibraltar Strait	Mediterranean Sea and Atlantic Ocean

104. Consider the following statements regarding Turquet's Octopus:

1. This is a species of benthic octopus that lives around Arctic.
2. It has been recorded endangered in IUCN list.
3. It is characterized by the absence of a skin ridge around the body, and its nearly smooth skin, which is covered with low granular bumps.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: According to a recent study published in the journal Science, Turquet's octopuses (Pareledone

turqueti) were able to navigate the region when the West Antarctic ice sheet melted around 125,000 years ago.

Turquet's octopus (Pareledone turqueti) is a species of benthic octopus that can be found in the Antarctic. It can be found at a wide range of depths, from shallow waters to 4,000 meters deep. It has **been recorded least concern in IUCN list.** It is characterised by the absence of a skin ridge around the body, and its nearly smooth skin, which is covered with low granular bumps. In the wild it is known to be preyed upon by Patagonian toothfish off South Georgia and Weddell seals off the South Shetland Islands. **Hence, only statement 3 is correct.**

105. Rambagh Gate that has recently secured prestigious UNESCO Asia-Pacific Award for Cultural Heritage Conservation, is located in which state?

- (a) Uttar Pradesh
- (b) Haryana
- (c) Rajasthan
- (d) Punjab

Answer: (D)

Explanation: Recently, three heritage projects from Punjab and Haryana have secured prestigious spots among the UNESCO Asia-Pacific Awards for Cultural Heritage Conservation 2023. **Award winning sites from India are as follows**

- The **Rambagh Gate in Amritsar received the "Award of Excellence,"** the highest recognition among all categories.
- Pipal Haveli, a heritage rural homestay from Punjab was honoured for its sustainable development.
- The Karnikara Mandapam at Kunnamangalam Bhagawati Temple in Kerala earned the Award of Distinction.
- Epiphany in Haryana, David Sassoon Library and Reading Room in Mumbai and Bikaner House in New Delhi received the Award of Merit.

106. Consider the following statements about NRI Deposits in India:

1. NRO and FCNR(B) accounts are Rupee denominated but NRE account deposits are in foreign currency.
2. NRI deposits provide a platform for Non-Resident Indians (NRIs) to invest their money in India.
3. NRI deposits are also non-taxable in India.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: NRI Deposits provide a financial platform for Non-Resident Indians (NRIs) to invest their wealth in India. Typically residing outside India, NRIs earn income in international currencies like the US dollar and Euro. The demand arises for an account capable of holding and converting their diverse assets and funds into Indian rupees. In response to this need, the NRI account serves a crucial role, facilitating the management and conversion of securities and money from various international currencies into Indian rupees. There are several types of NRI accounts tailored to different financial needs. **The NRE (Non-Resident External) Account is designed to enable the seamless transfer of money earned overseas to India. It operates as a rupee-dominated account that is repatriable,** allowing the transfer of international earnings back to India, and the interest earned on the NRE account is exempt from taxes. **On the other hand, the NRO (Non-Resident Ordinary) Account is formed and held in INR values, catering to revenue received within India, such as rent and dividends.** Notably, there is no currency conversion barrier, as deposits in the NRO account are made in rupee denominations. **Additionally, the FCNR (Foreign Currency Non-Resident) Account is instrumental for NRIs or Persons of Indian Origin looking to make deposits in foreign currency.** This account allows deposits in the denomination of currencies from their resident country. **The principal amount and interest in an FCNR Account are fully repatriable, and the interest income earned is non-taxable in India.** However, it is essential to adhere to the currencies prescribed by the Reserve Bank of India for holding in the FCNR account. These different account types cater to the diverse financial preferences and requirements of NRIs, providing flexibility and ease of managing their finances in India.

107. Consider the following pairs about the payloads on AstroSat:

Payload	Use
1. Ultra Violet Imaging Telescope (UVIT)	Performs imaging in three channels covering different UV and visible wavelength ranges.
2. Cadmium Zinc Telluride Imager (CZTI)	Hard X-ray detector array
3. Charged Particle Monitor (CPM)	Utilizes focusing optics and a CCD camera for X-ray imaging
4. Large Area X-ray Proportional Counter (LAXPC)	Covers X-ray timing and low-resolution spectral studies over a broad energy band

How many of the above pairs are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs

Answer: (C)

Explanation: AstroSat satellite is equipped with a diverse array of scientific instruments, known as payloads, each designed for specific observations in different wavelength ranges. Among these, the Ultra Violet Imaging Telescope (UVIT) plays a crucial role in imaging by utilizing three channels covering distinct UV and visible wavelength ranges. UVIT offers flexibility through spectral band selection facilitated by filters and grating for slitless spectroscopy.

The Soft X-ray Imaging Telescope (SXT) employs focusing optics and a CCD camera to capture X-ray images in the 0.3–8.0 keV band. Notably, it incorporates gold-coated conical foil mirrors to enhance its imaging capabilities. Another significant payload is the Large Area X-ray Proportional Counter (LAXPC), which is dedicated to covering X-ray timing and low-resolution spectral studies across a broad energy band ranging from 3 to 80 keV. This comprises a cluster of three co-aligned identical LAXPCs.

The Cadmium Zinc Telluride Imager (CZTI) serves as a hard X-ray imager with a Pixellated Cadmium-Zinc-Telluride detector array. Offering an effective area of 500 cm² and an energy range from 10 to 150 keV, CZTI provides valuable insights into high-energy phenomena. The Scanning Sky Monitor (SSM) is designed with three position-sensitive proportional counters featuring a coded mask for imaging purposes, drawing parallels to NASA's RXTE satellite's All Sky Monitor. To ensure optimal functionality and safeguard against potential damage, the Charged Particle Monitor (CPM) is incorporated as part of AstroSat's payloads. This monitoring system actively controls the operation of LAXPC, SXT, and SSM, particularly during orbits passing through regions with high fluxes of low-energy particles.

108. Which of the following statements about ASEAN India Trade in Goods Agreement is incorrect?

- (a) The agreement was signed during the 8th ASEAN Economic Ministers-India Consultations.
- (b) The agreement primarily pertains to the trade of tangible goods and products.
- (c) It became effective in the year 2010.
- (d) It does not encompass the trading of services.

Answer: (A)

Explanation: India and ASEAN are set to commence discussions in February with the aim of revising their 15-year-old free trade agreement, known as the ASEAN-India Trade in Goods Agreement (AITGA). The initiative seeks to achieve a more balanced deal that favors New Delhi. Since the implementation of AITGA in January 2010, there has been a notable imbalance, with

ASEAN benefiting disproportionately and India experiencing a widening trade deficit with the region. The trade deficit has escalated from \$7.5 billion per annum to \$43.57 billion in the fiscal year 2023. **AITGA, a significant trade arrangement between India and the ten ASEAN member states, was formally established during the 7th ASEAN Economic Ministers-India Consultations in Bangkok, Thailand, in 2009.** The agreement came into effect in 2010, commonly known as the ASEAN-India Free Trade Agreement. Serving as a framework agreement, AITGA lays the groundwork for future trade negotiations between India and ASEAN, primarily focusing on the exchange of physical goods and products. Notably, the agreement does not encompass trade in services.

109. Consider the following institutions:

1. NITI Aayog
2. Council of Scientific & Industrial Research
3. Central Drugs Standard Control Organisation
4. National Medical Commission
5. Indian Council of Medical Research

Which of the above institutions have collectively formed 'MedTech Mitra'?

- (a) 1, 3, 5
- (b) 2, 3, 4
- (c) 1, 2, 4, 5
- (d) 2, 3, 4, 5

Answer: (A)

Explanation: The virtual launch of 'MedTech Mitra' was recently conducted by Dr. Mansukh Mandaviya, the Union Minister of Health and Family Welfare and Chemicals & Fertilizers. **'MedTech Mitra' is a platform designed to support and nurture medical technology (MedTech) innovators within India.** The initiative offers guidance, resources, and assistance to shape research endeavors and navigate the regulatory approval process. **This collaborative venture involves NITI Aayog, ICMR, and CDSCO, aligning with the 'Viksit Bharat' vision.** The overarching goal of 'MedTech Mitra' is to contribute to the transformation of India's healthcare sector by 2047 through fostering indigenous innovation. The implementation of various schemes, including production-linked incentives, investments in medical drug parks, and research policies, aims to promote the indigenous development of high-quality yet affordable MedTech devices.

110. NASAMS, recently seen in news, is a:

- (a) High altitude combat uniform
- (b) Anti-material rifles
- (c) Surface-to-Air Missile System
- (d) Light tank

Answer: (C)

Explanation: NASAMS (Norwegian Advanced Surface-to-Air Missile System) is an advanced ground-based air defense system jointly developed by Kongsberg Defence & Aerospace and Raytheon. It defends against various airborne threats, including UAVs, helicopters, cruise missiles, UCAVs, and fixed-wing aircraft. **NASAMS was the first to use the AIM-120 AMRAAM as a surface-launched missile. NASAMS 2, operational since 2007, introduced Link 16 capability, while the latest version, NASAMS 3, deployed in 2019, adds the ability to fire AIM-9X Sidewinder, IRIS-T SLS, and AMRAAM-ER missiles, along with mobile air-liftable launchers. NASAMS demonstrates interoperability with longer-range systems like Patriot.**

111. Regarding Harsha's Kingdom, consider the following statements:

1. Harsha made Ujjain his seat of power.
2. The reign of Harsha is historically important because of the visit of Chinese pilgrim Fa-Hein.
3. Harshvardhana began the association of the Kumbh fair at Allahabad.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: A

Harshavardhana was a **Pushyabhuti emperor who ruled northern India from 606 to 647 CE.**

- Harsha made **Kannauj** his seat of power, and from there he extended his authority in all directions. **Hence, statement 1 is not correct.**
- The reign of **Harsha** is historically important because of the visit of Chinese pilgrim **Hsuan Tsang**, who left China in AD 629 and traveled to India. He had come to study at the Buddhist University of Nalanda situated in Bihar. **Hence, statement 2 is not correct.**
- **Fa-Hein's** visit to India occurred during the reign of **Chandragupta II.**
- Harshavardhana began the association at Allahabad at 644 BC. **Hence, statement 3 is correct.**

112. Consider the following statements:

1. Lithium-ion batteries use solid electrolyte and electrode.
2. Lithium ions move from the negative electrode to the positive electrode during charging of the battery.

How many of the above statements are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer:- D

- A lithium-ion (Li-ion) battery is a **type of rechargeable battery.**
- Li-ion batteries use an intercalated (Intercalation is the reversible inclusion or insertion of a molecule into materials with layered structures) lithium compound as one electrode material, compared to the metallic lithium used in a non-rechargeable lithium battery.
- The battery consists of an **electrolyte, which allows for ionic movement**, and the two electrodes are the constituent components of a lithium-ion battery cell. A lithium-ion battery uses **liquid electrolytes. Hence, statement 1 is not correct.**
- **Lithium ions** move from the **negative electrode** to the **positive electrode** during **discharge and back when charging. Hence, statement 2 is not correct.**

113. Consider the following statements:

1. Adverse possession refers to the acquisition of property through hostile, continuous, uninterrupted, and peaceful possession.
2. Any person in possession of private or government land for over 12 years can become the owner of that property.

How many of the above statements are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Adverse possession** refers to the **acquisition of property through hostile, continuous, uninterrupted, and peaceful possession. Hence, statement 1 is correct.**
- The concept aims to prevent long-standing doubts over land ownership and to benefit society by allowing someone to make use of idle land left by the owner.
 - It also provides protection to individuals who have regarded the occupant as the rightful owner of the property.
- **Major Provisions of the Limitation Act, 1963:**
 - **Burden of Proof:** The 1963 Act shifted the burden of proof of adverse possession to the claimant, thereby strengthening the position of the true owner.
 - **Acquisition of Ownership:** Under the **Limitation Act, 1963**, any person in possession of private land for **over 12 years or government land for over 30 years can become the owner of that property. Hence, statement 2 is not correct.**
- To claim adverse possession, the possession must be open, continuous, and adverse to the rights of the true owner for the required statutory period.

114. Consider the following agreements/rules:

1. Rescue Agreement
2. Liability convention
3. Moon Agreement

4. Helsinki Rules

How many of the above agreements/rules govern outer space?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer:- C

- **United Nations treaties on outer space:**
 - The treaties commonly referred to as the "five United Nations treaties on outer space" are:
 - **The Outer Space Treaty 1967:** Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.
 - **Rescue Agreement 1968:** Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.
 - **Liability Convention 1972:** Convention on International Liability for Damage Caused by Space Objects.
 - **The Registration Convention 1976:** Convention on Registration of Objects Launched into Outer Space.
 - **The Moon Agreement 1979:** Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
 - India is a signatory to **all five of these treaties but has ratified only four. India did not ratify the Moon agreement.**
- **The Helsinki Rules on the Uses of the Waters of International Rivers** is an international guideline regulating how rivers and their connected groundwaters that cross national boundaries may be used, adopted by the International Law Association (ILA) in Helsinki, Finland in 1966.
- **Hence, option c is correct.**

115. With reference to the President of India, consider the following statements:

1. He/she is elected through an electoral college system, wherein the votes are cast by national and State-level lawmakers.
2. Article 54 of the constitution deals with the election of the President.
3. Under Article 61, the President can be impeached for violation of the Constitution.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer:- C

- The Indian President is elected through an **electoral college system**, wherein the votes are cast by **national and State-level lawmakers**. Hence, **statement 1 is correct**.
- The elections are conducted and overseen by the **Election Commission (EC) of India**.
- The electoral college is made up of all the **elected members of the Upper and Lower Houses of Parliament** (Rajya Sabha and Lok Sabha MPs), and the **elected Members of the Legislative Assemblies** of States and Union Territories (MLAs).
- **Related Constitutional Provisions:**
 - **Article 54:** Election of President
 - **Hence, statement 2 is correct.**
 - **Article 55:** Manner of election of President.
 - **Article 56:** Term of office of President
 - **Article 57:** Eligibility for re-election.
 - **Article 58:** Qualifications for election as President
- According to **Article 61**, the President can be removed from his office before the expiry of his term only **on the grounds of violation of the constitution**. Hence, **statement 3 is correct**.

116. Valkyrie, recently seen in news, is a:

- (a) World's first fully smart car
- (b) Humanoid robot of NASA
- (c) A form of genetic aberration
- (d) A newly discovered star

Answer: (B)

Explanation: Valkyrie, a 6-foot-2-inch humanoid space robot developed by NASA's Johnson Space Center in Houston, Texas, is undergoing tests designed for **operation in degraded or damaged human-engineered environments, such as those impacted by natural disasters**.

Costing \$2 million, Valkyrie is set to participate in NASA's Space Robotics Challenge, with a \$1 million prize for the winning team. Resembling Iron Man, it features a LIDAR sensor, cameras, and sensors for environmental awareness. Equipped with three-fingered hands containing 38 sensors, the robot has 44 degrees of freedom controlled by small motors. Powered by two Intel Core i7 computers, Valkyrie has a one-hour battery life. Originally designed for disaster relief, it was reconfigured for potential use as a "caretaker" robot on Mars.

117. Bio-electronic soil uses which of the following techniques to enhance plant growth?

- (a) Aeroponics
- (b) Geoponics
- (c) Hydroponics
- (d) Intensive cropping

Answer: (C)

Explanation: The **bio-electronic soil (eSoil)** holds promise for revolutionizing hydroponic farming by

offering potential solutions to enhance crop yields, particularly in regions facing adverse environmental conditions. One notable advantage lies in its potential to diminish the reliance on fertilizers, presenting a more sustainable approach to farming. Moreover, the incorporation of eSoil in hydroponic farms holds the prospect of optimizing energy consumption, addressing the energy-intensive nature of traditional hydroponic methods. While the technology's energy efficiency is evident, comprehensive studies are imperative to gauge its long-term impact on the complete plant growth cycle. Future research endeavors aim to extend the understanding of how this innovative technique influences the growth of diverse plant species beyond barley.

118. Consider the following statements about NPA:

1. NPAs remaining for less than or equal to 12 months are categorized as substandard assets.
2. Assets classified as NPAs for 12 or more months fall under the category of doubtful assets.
3. Loss assets are those where a loss is identified, and the loan is completely written off.

How of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Substandard assets signify non-performing assets (NPAs) lingering for up to 12 months, displaying early signs of credit deterioration. **Hence statement 1 is correct.** Doubtful assets denote loans persistently classified as NPAs for 12 months, representing increased uncertainty and default risk. **Hence statement 2 is correct.** Loss assets indicate loans with identified losses where some residual value remains, avoiding complete write-off. **Hence statement 3 is incorrect.** These classifications in banking help gauge the severity of credit quality deterioration and guide institutions in managing risk. Substandard assets signal initial concerns, doubtful assets mark a higher risk level, and loss assets acknowledge identified losses with potential recoverable value.

119. Consider the following pairs:

Term	Meaning
1. Pardon	Clears the convict of both sentence and conviction, removing all penalties.
2. Commutation	Reduces sentence duration without altering its core nature.

3. Remission	Temporarily delays sentence execution, allowing time for pardon or commutation.
4. Respite	Grants a milder sentence, considering special circumstances.
5. Reprieve	Swaps harsh punishment for a lighter one

How many of the above pairs are correctly matched?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) Only four

Answer: (B)

Explanation:

- **Pardon:** Completely clears the convict of both the sentence and conviction, removing all associated penalties and disqualifications. Hence pair 1 is correctly matched.
- **Commutation:** Swaps a harsher form of punishment with a lighter one, like changing a death sentence to rigorous imprisonment, which can then be further commuted to simple imprisonment. Hence pair 2 is incorrectly matched.
- **Remission:** Reduces the duration of the sentence without changing its fundamental nature, such as shortening a 1-year imprisonment to 6 months. Hence pair 3 is incorrectly matched.
- **Respite:** Grants a more lenient sentence than initially imposed, considering specific circumstances like the physical disability of a convict or the pregnancy of a female offender. Hence pair 4 is correctly matched.
- **Reprieve:** Temporarily postpones the execution of a sentence, especially in the case of a death sentence, to allow the convict time to seek pardon or commutation from the President. Hence pair 5 is incorrectly matched.

120. Consider the following statements regarding Huntington's disease:

1. Huntington's disease primarily affects brain cells that regulate involuntary movements.
2. Early onset Huntington's disease, known as juvenile Huntington's disease, is more common than adult onset.
3. Loss of coordination, difficulty swallowing, and slurred speech are physical symptoms of Huntington's disease.
4. A genetic mutation in the HTT gene leads to the abnormal shape of the huntingtin protein, causing the destruction of nerve cells in the basal ganglia and brain cortex.

How of the above statements is/are correct?

- (a) Only one
- (b) Only two

- (c) Only three
(d) All four

Answer: (D)

Explanation: Huntington's disease is a neurodegenerative disorder primarily affecting brain cells that govern voluntary movement and memory. Involuntary movements, a hallmark of the disease, result from damage to the basal ganglia, disrupting coordination. Symptoms include difficulty swallowing (dysphagia), slurred speech, and loss of coordination (ataxia). Juvenile Huntington's disease, an early-onset form, affecting children and teenagers, is rarer than the adult-onset type, which manifests after age 30. The genetic mutation in the HTT gene leads to the abnormal huntingtin protein, crucial for nerve cell function. The malformed protein causes the destruction of neurons in the basal ganglia, impacting movement regulation, and the brain cortex, affecting cognitive functions. This progressive condition intensifies over time, making daily tasks increasingly challenging. **Hence all the statements are correct.**

121. Which of the following statements are incorrect about Synthetic diamonds?

- (a) They are mostly manufactured through two processes, High Pressure, High Temperature (HPHT) method or Chemical Vapour Deposition (CVD) method.
(b) Synthetic diamonds are used to efficiently dissipate heat in high-power electronics like laser diodes and transistors.
(c) The government has taken action to reduce the duty on seeds for rough LGDs from 5% to zero.
(d) None of the above

Answer: (D)

Explanation: These diamonds are primarily produced using two methods: High Pressure, High Temperature (HPHT) or Chemical Vapour Deposition (CVD). Both methods start with a diamond seed, typically a slice of another diamond. Pure synthetic diamonds serve as effective heat spreaders in electronics, specifically for high-power laser diodes, laser arrays, and high-power transistors.

The 2023 Union Budget aims to boost the production of lab-grown diamonds in India by pledging to eliminate the basic customs duty on seeds used in their manufacture, reducing the duty on rough LGD seeds from 5% to nil.

122. Consider the following Jain Teerthankars:

Teerthankars	Symbols
1. Vardhamana Mahavira	Lion
2. Mallinath	Water Jug(kalasha)
3. Vimalnath	Boar

4. Pushpadanta

Dolphins

How many of the above pairs are correctly matched?

- (a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (D)

Explanation:

- **Vardhamana Mahavira:** Vardhamana Mahavira, symbolized by a lion and associated with the color golden, embodies strength and courage. His title, "Prospering Great Hero," reflects the regality and power of his teachings in Jainism.
- **Mallinath:** Malli, represented by a water jug (kalasha) and linked to the color blue, signifies strength, purity, and serenity. The wrestler emblem suggests resilience, creating a portrait of a Tirthankara with a balance of strength and tranquility.
- **Vimalnath:** Vimala, symbolized by a boar and associated with the color golden, represents clarity and fearlessness. The boar's symbolism aligns with the tenacity implied by the name, and the golden color emphasizes purity and spiritual illumination.
- **Pushpadanta:** Also known as Suvidi, Pushpadanta is associated with religious duties, symbolized by a dolphin or sea dragon, and linked to the color white. His symbolism conveys joyful dedication to religious practices, coupled with strength derived from spiritual awareness.

123. Consider the following statements about tigers in India:

1. India is home to more than 70% of the global wild tiger population, boasting a minimum of 3,167 tigers.
2. Nine tiger reserves received CA|TS accreditation in the current year.
3. The wild tiger population in India demonstrates a robust growth rate of 16% per year.

How many of the above statements is/are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)

Explanation: India holds a preeminent position in global tiger conservation efforts, harboring more than 70% of the world's wild tiger population, totaling a minimum of 3,167 tigers. **The recent release of the 5th cycle of the All India Tiger Estimation 2022 summary report underscores India's commitment to tracking and preserving its tiger population. Hence, statement 1 is correct.** In a noteworthy achievement, six tiger reserves have received Conservation Assured Tiger Standards

(CA) TS) accreditation this year, contributing to a total of 23 accredited reserves in the country. **Hence, statement 2 is not correct.** Despite the positive growth rate of 6% per year in India's wild tiger numbers, challenges such as poaching and habitat fragmentation persist. The National Tiger Conservation Authority (NTCA) remains actively engaged in collaborative efforts with Forest Departments to address these challenges and safeguard crucial habitats and corridors for the thriving tiger population. **Hence, statement 3 is not correct.**

124. Consider the following ranks:

1. Brigadier
2. Captain (Navy)
3. Wing Commander
4. Sub-lieutenant

Arrange the above in a hierarchical manner (bottom to top).

- (a) 2, 4, 1, 3
- (b) 2, 1, 4, 3
- (c) 4, 2, 3, 1
- (d) 4, 3, 2, 1

Answer: (C)

Explanation:

Air Force	Army	Navy
1. Marshal of the Indian Air Force	Field Marshal	Admiral of the Fleet
2. Air Chief Marshal	General	Admiral
3. Air Marshal	Air Marshal Lieutenant General (Army Commodore/ VCOAS) Vice Admiral / FOC-in-C / VCNS	Vice Admiral / FOC-in-C / VCNS
4. Air Vice Marshal	Lieutenant General	Vice Admiral
5. Group Captain	Colonel	Captain
6. Wing Commander	Lieutenant Colonel	Commander
7. Squadron Leader	Major	Lieutenant Commander

8. Flight Lieutenant	Captain	Lieutenant
9. Flying Officer	Lieutenant	Sub Lieutenant
10. Flight Cadet	-	-

125. Consider the following description:

Nestled in the tranquil environs of the Chandaka forest, lies a remarkable zoological park and botanical garden spanning 437 hectares (1,080 acres). This expansive sanctuary encompasses the scenic 134-acre (54 ha) Kanjia lake. Distinguished as the first of its kind in India, it introduces a novel approach to wildlife exploration. Visitors embark on a safari adventure where they remain enclosed in a vehicle while the animals roam freely in their natural habitat. Additionally, this immersive experience extends to observing sloth bears in their undisturbed natural surroundings, providing a unique and enriching wildlife encounter.

Which of the following places is best explained in the above description?

- (a) Kotagarh Wildlife Sanctuary
- (b) Satkosia Wildlife Sanctuary
- (c) Nandankanan Zoological Park
- (d) Chilika Wildlife Sanctuary

Answer: (C)

Explanation: Nandankanan Zoological Park, a sprawling 437-hectare zoo and botanical garden in Bhubaneswar, Odisha, India, was established in 1960 and opened to the public in 1979. A pioneer in wildlife conservation, it became the first zoo in India to join the World Association of Zoos and Aquariums (WAZA) in 2009. **Nandankanan, known as The Garden of Heaven, is set amidst the Chandaka forest, featuring the picturesque 134-acre Kanjia Lake.** Following a major upgrade in 2000 post the super-cyclone damage, it now attracts over 2.6 million visitors annually. Notably, Nandankanan offers a distinctive white tiger safari, allowing visitors an immersive experience as animals roam freely in their natural habitat. The park also **features a lion safari and a sloth bear safari, making it a unique destination for wildlife enthusiasts.**

Practice MCQs on Conventional Subjects- December 2023

1. Which of the following are merits of flexible exchange rate system?

1. The main feature of the flexible exchange rate system is that there must be credibility that the government will be able to maintain the exchange rate at the level specified.
2. Under flexible exchange rate system, the government need not maintain large stocks of foreign exchange reserves.
3. Movements in the exchange rate automatically take care of the surpluses and deficits in the BoP.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: The main feature of the fixed exchange rate system is that there must be credibility that the government will be able to maintain the exchange rate at the level specified. Often, if there is a deficit in the BoP, in a fixed exchange rate system, governments will have to intervene to take care of the gap by use of its official reserves. The flexible exchange rate system gives the government more flexibility and they do not need to maintain large stocks of foreign exchange reserves. **The major advantage of flexible exchange rates is that movements in the exchange rate automatically take care of the surpluses and deficits in the BoP.** Also, countries gain independence in conducting their monetary policies, since they do not have to intervene to maintain exchange rate which are automatically taken care of by the market. **Hence, statement 1 is not correct.**

2. In WTO terminology, subsidies in general are identified by “boxes” which are given different colours. Consider the following pairs regarding them:

1. Amber Box: Domestic support measures considered to distort production and trade
2. Green box: Subsidies are allowed even if they distort trade.
3. Blue Box: No limits on subsidies or spending

How many of the above pairs is/are correctly matched?

- (a) Only one
- (b) Only two

- (c) All three
- (d) None

Answer: (B)

Explanation: All domestic support measures considered to distort production and trade (with some exceptions) fall into the amber box, which is defined as all domestic supports except those in the blue and green boxes. **These include measures to support prices, or subsidies directly related to production quantities. These supports are subject to limits: “de minimis” minimal supports are allowed. This threshold is generally 5% of the value of agricultural production for developed countries, 10% for most developing countries.** In order to qualify, green box subsidies must not distort trade, or at most cause minimal distortion. They have to be government-funded (not by charging consumers higher prices) and must not involve price support. **Blue Box is the “amber box with conditions” — conditions designed to reduce distortion.** Any support that would normally be in the amber box, is placed in the blue box if the support also requires farmers to limit production. **Hence, pair 2 is not correctly matched.**

3. Which of the following can lead to Demand-Pull Inflation?

1. A growing economy
2. Increase in Forex reserves
3. Deficit financing by the government
4. Depreciation of rupee

Select the correct answer using the code given below:

- (a) 1, 2 and 3
- (b) 1, 3 and 4
- (c) 2 and 3
- (d) 1, 2, 3 and 4

Answer: (D)

Explanation: Demand-Pull Inflation: This type of inflation is caused due to an increase in aggregate demand in the economy.

Causes of Demand-Pull Inflation:

- A growing economy or increase in the supply of money – When consumers feel confident, they spend more and take on more debt. This leads to a steady increase in demand, which means higher prices.
- Asset inflation or Increase in Forex reserves.
- Government spending or Deficit financing by the

government – When the government spends more freely, prices go up.

- Due to fiscal stimulus.
- Increased borrowing.
- Depreciation of rupee.
- Low unemployment rate.

Effects of Demand-Pull Inflation:

- Shortage in supply
- Increase in the prices of the goods (inflation).
- The overall increase in the cost of living.

4. Which of the following institutions were established under Bretton Woods Conference?

1. International Monetary Fund (IMF)
2. World Trade Organization
3. World Bank
4. European Bank for Reconstruction and Development

Select the correct answer using the code given below:

- (a) 1, 2 and 3
- (b) 1, 3 and 4
- (c) 1 and 2
- (d) 1, 2, 3 and 4

Answer: (B)

Explanation: The Bretton Woods System: The Bretton Woods Conference held in 1944 set up the International Monetary Fund (IMF) and the World Bank. The Bretton Woods Agreement was a monetary and exchange rate management system that attempted to encourage international financial cooperation through the introduction of a system of convertible currencies at fixed exchange rates.

5. Consider the following statements regarding Reserve Tranche:

1. It is a portion of the required quota of currency each member country must provide to the International Monetary Fund (IMF) that can be utilized by the members for its own purposes.
2. It is an emergency account that IMF members can access at any time, but agreeing to conditions or by paying a service fee.
3. IMF Members cannot borrow beyond 100% of their reserve tranche position.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: A reserve tranche is a portion of the required quota of currency each member country

must provide to the International Monetary Fund (IMF) that can be utilized for its own purposes—without a service fee or economic reform conditions. Hence, statement 1 is correct. The IMF is funded through its members and their quota contributions. The reserve tranche is basically an emergency account that IMF members can access at any time without agreeing to conditions or paying a service fee. Hence, statement 2 is not correct. In theory, members can borrow over 100% of their quota. However, if the amount being sought by the member nation exceeds its reserve tranche position (RTP), then it becomes a credit tranche that must be repaid in three years with interest. Hence, statement 3 is not correct.

6. A spacesuit provides which of the following benefits to the astronauts?

1. It protects astronauts from space radiation as well as micrometeorites and other particles moving across space.
2. It provides astronauts with a constant supply of air and optimum air pressure around their body.
3. It protects the human body from the extreme temperature fluctuations of space.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: Without a spacesuit, humans will not survive for long in the harsh conditions of outer space or the lunar surface. First, spacesuits protect the human body from the extreme temperature fluctuations of space. In absence of an atmosphere, areas which receive direct sunlight become extremely hot whereas areas in the dark are frigid. The first job of a space suit is to insulate the astronaut inside from the extreme temperatures. Second, spacesuits also provide astronauts with a constant supply of air and optimum air pressure around their body. They are pressurised to this effect, making them more like human shaped space vehicles than a piece of clothing. Third, spacesuits protect astronauts from space radiation which can be extremely harmful, as well as micrometeorites and other particles moving across space, often at incredible speeds. On the lunar surface, suits also protect astronauts from lunar dust, considered by NASA experts as the “number one environmental problem on the moon”. Much more abrasive than dust on earth, it tends to corrode everything it comes into contact with and can potentially cause lung diseases. By helping astronauts survive even in the harshest conditions of space, spacesuits allow them

to perform tasks in space, carry out experiments and fulfill the objectives of their mission. **Hence, all statements are correct.**

7. Consider the following statements:

1. Graphene is a double-atom-thick layer of carbon atoms bonded in a honeycomb pattern.
2. Graphene can display the property of giant magnetoresistance (GMR) at room temperature.
3. Giant magnetoresistance (GMR) is the result of the electrical resistance of a conductor being affected by magnetic fields in adjacent materials.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Researchers in the UK, led by Nobel laureate Andre Geim, have discovered another property of **graphene – a single-atom-thick layer of carbon atoms bonded in a honeycomb pattern** – that further distinguishes this ‘wonder’ material. **Dr. Geim & co. found that graphene displays an anomalous giant magneto resistance (GMR) at room temperature.** GMR is the result of the electrical resistance of a conductor being affected by magnetic fields in adjacent materials. It is used in hard disk drives and magneto resistive RAM in computers, biosensors, automotive sensors, microelectro mechanical systems, and medical imagers. **Hence, statement 1 is not correct.**

8. Consider the following statements:

1. Variations in the solar weather can change the orbits of satellites or shorten their lives.
2. A satellite placed in the halo orbit around Lagrangian Point 1 (L1) of the Sun-Earth system has the advantage of continuously viewing the Sun without any occultation.
3. Satellites placed in the Lagrange Points require more fuel to remain in position.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: The solar weather and environment affect the weather of the entire system. Variations in this weather can change the orbits of satellites or shorten their lives, interfere with or damage onboard electronics, and cause power blackouts and other disturbances on Earth. Knowledge of solar events is

key to understanding space weather. Every storm that emerges from the Sun and heads towards Earth passes through L1, and a satellite placed in the halo orbit around L1 of the Sun-Earth system has the major advantage of continuously viewing the Sun without any occultation/eclipses. **L1 refers to Lagrangian/Lagrange Point 1, one of five points in the orbital plane of the Earth-Sun system. Lagrange Points, named after Italian-French mathematician Josephy-Louis Lagrange,** are positions in space where the gravitational forces of a two-body system (like the Sun and the Earth) produce enhanced regions of attraction and repulsion. These can be used by spacecraft to reduce fuel consumption needed to remain in position. The L1 point is home to the Solar and Heliospheric Observatory Satellite (SOHO), an international collaboration project of NASA and the European Space Agency (ESA). **Hence, statement 3 is not correct.**

9. Consider the following statements regarding Mucormycosis:

1. Mucormycosis is a fungal infection caused by a group of molds called mucormycetes.
2. It affects the sinuses, the brain and the lungs and can be life-threatening in diabetic and cancer patients.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Mucormycosis is a serious but rare fungal infection caused by a group of molds called mucormycetes. These molds live throughout the environment. It is caused by exposure to mucor mould which is commonly found in soil, plants, manure, and decaying fruits and vegetables. It affects the sinuses, the brain and the lungs and can be life-threatening in diabetic or severely immunocompromised individuals, such as cancer patients or people with HIV/AIDS. **Hence, both statements are correct.**

10. Aedes aegypti mosquito mainly spreads which of the following diseases?

1. Chikungunya
2. Yellow fever
3. Malaria
4. Japanese Encephalitis

How many of the above options is/are correct?

- (a) Only one
- (b) Only two

- (c) Only three
- (d) All four

Answer: (B)

Explanation: *Aedes aegypti*, the yellow fever mosquito, is a mosquito that can spread dengue fever, chikungunya, Zika fever, Mayaro and yellow fever viruses, and other disease agents. Malaria is transmitted by Anopheles mosquito. Japanese Encephalitis is generally spread by mosquitoes, specifically those of the Culex type.

11. Consider the following statements regarding Temperate Deciduous Biome:

1. They are found in areas with warm moist summers and cool winters.
2. Soils of temperate forests are podzolic and fairly deep.
3. The trees shed their leaves in the summer season.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Temperate deciduous or temperate broad-leaf forests are a variety of temperate forest 'dominated' by trees that lose their leaves each year. They are found in areas with warm moist summers and cool winters. Soils of temperate forests are podzolic and fairly deep. The trees shed their leaves in the cold season. This is an adaptation for protecting themselves against the winter snow and frost. **Hence, statement 3 is not correct.**

12. Consider the following statements regarding Peatlands:

1. Peatlands are wetlands where permanently waterlogged conditions prevent the complete decomposition of dead plant material.
2. Peatlands are highly space-effective carbon stocks and contain more carbon than the entire forest biomass of the world.
3. Peatlands are formed only under tropical climate conditions.

How many of the above statements is/are not correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Peatlands are formed due to the accumulation of partially decomposed plant remains

over thousands of years under conditions of water-logging. **Peatlands, which play a crucial role in regulating global climate by acting as carbon sinks, are facing degradation. Peatlands (lands with peat at the surface) are highly space-effective carbon stocks: they cover only 3% of the land, but contain more carbon than the entire forest biomass of the world. Peatlands contain 30 per cent of the world's soil carbon.** When drained, these emit greenhouse gases, contributing up to one gigaton of emissions per year through oxidation. **Peatlands occur in different climate zones. While in tropical climate, they can occur in mangroves, in Arctic regions, peatlands are dominated by mosses.** Some mangrove species are known to develop peatland soils under them. Besides climate mitigation, peatlands are important for archaeology, as they maintain pollen, seeds and human remains for a long time in their acidic and water-logged conditions. In many countries, pristine peatlands are important for recreation activities. These areas also support livelihood in the form of pastoralism. The vegetation growing on pristine peatlands provide different kinds of fibres for construction activities and handicrafts. **Hence, statement 3 is not correct.**

13. Which of the following are the characteristic of pollutants for Biomagnification to occur?

1. Pollutant must be biologically active.
2. Pollutant must be short-lived.
3. Pollutant must be soluble in fats.

Select the correct answer using code given below:

- (a) 1 and 2
- (b) 1 and 3
- (c) 2 and 3
- (d) 1, 2 and 3

Answer: (B)

Explanation: Biomagnification refers to the tendency of pollutants to concentrate as they move from one trophic level to the next. Thus in biomagnification there is an increase in concentration of a pollutant from one link in a food chain to another. **In order for biomagnification to occur, the pollutant must be: long-lived, mobile, soluble in fats, biologically active.** If a pollutant is short-lived, it will be broken down before it can become dangerous. If it is not mobile, it will stay in one place and is unlikely to be taken up by organisms. If the pollutant is soluble in water, it will be excreted by the organism. Pollutants that dissolve in fats, however, may be retained for a long time. **Hence, statement 2 is not correct.**

14. Consider the following statements regarding Jim Corbett National Park:

1. Jim Corbett National Park was the first to come under the Project Tiger Initiative.
2. Jim Corbett National Park is a national park and tiger reserve that completely encompasses the Shivaliks, near the foothills of the Himalayas.
3. Jim Corbett Tiger Reserve (CTR) has the highest tiger density in the wild in India.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) Only Three
- (d) None

Answer: (B)

Explanation: Jim Corbett National Park is a national park in India located in the Nainital district of Uttarakhand state. The first national park in India, it was established in 1936 during the British Raj. The park was the first to come under the Project Tiger initiative. Corbett Tiger Reserve (CTR) has reported the highest tiger density among India's tiger reserves. Rajaji National Park is an Indian national park and tiger reserve that encompasses the Shivaliks, near the foothills of the Himalayas. **Hence, statement 2 is not correct.**

15. Which of the following National Parks are located in Assam?

1. Nameri National Park
2. Orang National Park
3. Gorumara National Park
4. Manas National Park

Select the correct answer using the code given below:

- (a) 1 and 2
- (b) 1, 2 and 4
- (c) 2 and 4
- (d) 1, 2, 3 and 4

Answer: (B)

Explanation: Nameri National Park, Manas National Park, Kaziranga National Park, Orang National Park and Deepor Beel Bird Sanctuary are located in Assam. **Gorumara National Park is located in West Bengal.**

16. Consider the following statements regarding features of the Government of India Act of 1935:

1. End of diarchy in governorate provinces
2. Governors have the power of veto in legislative actions and making laws on their own.
3. End of the rule of communal representation

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only

- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (B)

Explanation: By the **Government of India Act of 1935, the provinces got self-governance in place of dual governance and the distinction between reserved and transferred subjects ended.** Governors were given the right to exercise 'personal decision' and 'discretionary powers' under the name of reserve and protection, along with this the Governor was also given the right to issue ordinances. **Through this Act, communal and class voters expanded and Scheduled Castes, Muslims, Sikhs, Europeans, Indian-Christians, Anglo-Indians and Indian Muslims etc. got separate representation. Hence, statement 1 and 2 are correct while statement 3 is not correct.**

17. With reference to the Regulating Act of 1773, consider the following statements:

1. Provision was made for the appointment of the Governor General and three other members.
2. A Supreme Court was established in Calcutta, consisting of a Chief Justice and four other judges.
3. The Governor General-in-Council had the power to cast a casting vote.

Which of the statements above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) 1, 2 and 3

Answer: (C)

Explanation: Under the **Regulating Act of 1773, the Governor of Fort William came to be known as the Governor General** and a council was appointed for him, the four members of which were Philip Francis, Clavering Manson, and Barwell. **Hence statement 1 is not correct.** A Supreme Court was established in Calcutta consisting of a Chief Justice and 3 other judges. **The Chief Justice was Elijah Impey. The three other judges were Chambers, Limester, and Hyde. Hence statement 2 is not correct.** Under this Act, the Governor General in Council had the right to give a casting vote. **Hence statement 3 is correct.**

18. Consider the following statements:

1. The father of Mahalwari system was Halt McKenzie.
2. The Ryotwari system was implemented for the first time by Colonel Reed.
3. Charles Grant opposed the land ownership rights of the landlords.

How many of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (A)

Explanation: Under the Mahalwari system, the revenue system was established with each mahal. The father of this system was Halt McKenzie. **Hence, statement 1 is correct.** The Ryotwari system was implemented in Madras, Bombay and Coorg. It was first implemented by Colonel Reed in 1792. **Hence statement 2 is correct.** There was a difference of opinion between John Shore and James Grant regarding land ownership rights under the Permanent Settlement. John Shore accepted the landlords as the owners of the land, whereas according to James Grant all the land belonged to the government. **Hence statement 3 is incorrect.**

19. Consider the following statements:

1. The India Currency Commission was formed under the chairmanship of Sir Henry Fowler.
2. Imperial Bank of India was established in 1921.
3. Reserve Bank of India was established on the recommendation of Hilton Young Commission.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (D)

Explanation: The Indian Currency Commission was formed in 1890 AD under the chairmanship of Sir Henry Fowler. This committee declared Ashrafi and Rupee as unlimited legal tender. **Hence statement 1 is correct.** In 1921 AD, The Imperial Bank of India was established by merging the three Presidency Banks. **Hence statement 2 is correct.** On the basis of the recommendation of the Hilton Young Commission in 1931, the Reserve Bank of India was established in 1935 AD. **Hence statement 3 is correct.**

20. Consider the following pairs:

1. First Anglo-Mysore War	Treaty of Mangalore
2. Second Anglo-Mysore War	Treaty of Madras
3. Third Anglo-Mysore War	Treaty of Srirangapatna

Which of the pairs given above is/are matched?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) 1, 2 and 3

Answer: (C)

Explanation: The first Anglo-Mysore war took place in 1767-69 AD, which ended with the Treaty of Madras. The Second Anglo-Mysore War took place in 1780-84, which ended with the Treaty of Mangalore whereas the Third Anglo-Mysore War took place in 1790-92. It was concluded by the Treaty of Srirangapatna. **Hence, pair 1 and 2 are not correctly matched, while pair 3 is correctly matched.**

21. Consider the following statements regarding Regulating Act of 1773:

1. It was the first step taken by the British Government to control and regulate the affairs of the East India Company in India.
2. It designated the Governor of Bengal as the 'Governor-General of India' and vested in him major executive powers.
3. It provided for the establishment of a Supreme Court at Calcutta presidency.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: This act is very important to the constitution because it was the first action taken by the British Government to control and regulate the East India Company's operations in India; it also recognized the Company's political and administrative functions for the first time; and it established the framework for central administration in India. In order to support the Governor of Bengal, it established an Executive Council consisting of four members and named him the "Governor-General of Bengal." **Lord Warren Hastings was the first Governor-General of that kind.** It allowed for the Supreme Court to be established in Calcutta. **Hence, statement 2 is not correct.**

22. Consider the following statements regarding 'Objectives resolution':

1. The resolution laid down the fundamentals and philosophy of the constitutional structure.
2. This Resolution was unanimously adopted by the Constituent Assembly.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: In December, 1946, Jawaharlal Nehru moved the historic 'Objectives Resolution' in the Assembly. It laid down the fundamentals and philosophy of the constitutional structure. It included the major values and ideals of sovereignty, republic, fundamental rights, directive principles, non-interference etc. It sought to secure to ideals mentioned in the Preamble. It provided for adequate safeguards for minorities, backward and tribal areas, and depressed and other backward classes. **This Resolution was unanimously adopted by the Assembly on January 22, 1947.** It influenced the eventual shaping of the constitution through all its subsequent stages. Its modified version forms the Preamble of the present Constitution. **Hence, both statements are correct.**

23. With reference to the Charter Act, 1813, consider the following statements:

1. By this act the trading monopoly of the British East India Company (the monopoly on the trade with China and tea remained) was abolished.
2. In this act, a provision of one lakh rupees was made every year for the spread of education in India.
3. The revenue of India came under the control of the British Parliament.

Which of the above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (A)

Explanation: By the Charter Act, 1813 the trading monopoly of the British East India Company (the monopoly on the trade of China and tea remained) was abolished. Also, through this act, the sovereignty of the British Crown over the Indian territories occupied by the Company was also strengthened. **Hence, statement 1 is correct.** In this act, a provision of one lakh rupees was made every year for the spread of education in India. In 1823, the General Committee of Public Instruction was formed, in whose responsibility there was a provision of giving one lakh rupees for education. **Hence, statement 2 is also correct.** The revenue of India was brought under the direct control of the British Parliament by the Act of 1858 AD. **Hence statement 3 is not correct.**

24. Consider the following statements:

1. Equality before the law
2. Right against discrimination
3. Right to contest elections
4. Freedom to travel freely in the country

Which of the above rights is/are not available to all persons in India?

- (a) 1, 2 and 4 only
- (b) 1, 3 and 4 only
- (c) 2, 3 and 4 only
- (d) 1, 2 and 3 only

Answer: (C)

Explanation: Right to equality before the law mentioned in Article 14 of the Constitution is available to all persons including citizens in India. **Hence statement 1 is not correct.** The other three rights in question are available only to Indian citizens.

25. Consider the following statements with reference to Gandhian principles, which are reflected in the Directive Principles of State Policy:

1. Consolidation of Village Panchayats
2. Uniform Civil Code
3. To encourage cottage industry in rural areas.
4. Promotion of educational and economic interests of Scheduled Castes and Scheduled Tribes and weaker sections of the society.

How many of the above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (C)

Explanation: DPSP based on Gandhian philosophy are as follows- Organization of village panchayats (Article 40), promotion of cottage industries in rural areas (Article 43), promotion of educational and economic interests of Scheduled Castes and Scheduled Tribes and weaker sections of the society (Article 46), Prohibition on the consumption of drugs, drugs other than medicinal purposes (Article 47), Prohibition of slaughter of cows and calves and other milch animals and improvement of their breeds (Article 48) whereas Uniform Civil Code (Article 44) comes under Liberal intellectual theory. **Hence statement 2 is not correct.**

26. Consider the following pairs regarding wind circulation:

1. Ferrel Cell : Cell in the middle latitudes
2. Hadley Cell : Cell in the tropics
3. Polar Cell : Cell in the polar region

How many of the above pairs is/are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) All three pairs
- (d) None

Answer: (C)

Explanation: Circulations from the surface upwards and vice-versa are called cells. Such a cell in the tropics is called Hadley Cell. In the middle latitudes the circulation is that of sinking cold air that comes from the poles and the rising warm air that blows from the subtropical high. **At the surface these winds are called westerlies and the cell is known as the Ferrel cell.** At polar latitudes the cold dense air subsides near the poles and blows towards middle latitudes as the polar easterlies. This cell is called the polar cell. These three cells set the pattern for the general circulation of the atmosphere. The transfer of heat energy from lower latitudes to higher latitudes maintains the general circulation. **Hence, all pairs are correctly matched.**

27. Consider the following statements regarding Aravalli Ranges:

1. They are one of the oldest fold mountains of the world and the oldest in India.
2. They are aligned in north-west to south-east direction.
3. Luni, Banas and Sahibi rivers flow from the Aravalli ranges.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: They are aligned in north-east to south-west direction. They run between Delhi and Palanpur in Gujarat. They are one of the oldest fold mountains of the world and the oldest in India. **According to some geographers, one Branch of the Aravalis extends to the Lakshadweep Archipelago through the Gulf of Khambhat and the other into Andhra Pradesh and Karnataka.** Three major rivers and their tributaries flow from the Aravalli, namely Banas and Sahibi rivers which are tributaries of Yamuna, as well as Luni River which flows into the Rann of Kutch. **Hence, statement 2 is not correct.**

28. Consider the following statements regarding Intertropical Convergence Zone (ITCZ):

1. The ITCZ is a zone of convergence at the thermal equator where the trade winds meet.
2. It is a low-pressure belt and migrates with the changing position of the thermal equator.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: The ITCZ is a zone of convergence at the thermal equator where the trade winds meet and it is a zone where air tends to ascend. It is a low-pressure belt and migrates with the changing position of the thermal equator. The movement of the thermal equator shifts the belts of planetary winds and pressure systems to the north and to the south annually. **Hence, both statements are correct.**

29. Consider the following statements regarding Temperature Inversion:

1. Temperature Inversion is a situation where the temperature decreases with increasing altitude.
2. A long summer night with cloudy skies and moving air is ideal situation for inversion.

Which of the above statements is/are not correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Normally, temperature decreases with increase in elevation. It is called normal lapse rate. At times, the situations are reversed and the normal lapse rate is inverted. It is called Inversion of temperature. Inversion is usually of short duration but quite common nonetheless. A long winter night with clear skies and still air is ideal situation for inversion. The heat of the day is radiated off during the night, and by early morning hours, the earth is cooler than the air above. **Hence, both statements are incorrect.**

30. It is white or colourless and used in radio and radar. It is one of the most important components of granite. Which of the following mineral is associated with the above feature?

- (a) Pyroxene
- (b) Quartz
- (c) Feldspar
- (d) Mica

Answer: (B)

Explanation: Quartz is one of the most important components of sand and granite. It consists of silica. It is a hard mineral virtually insoluble in water. It is white or colourless and used in radio and radar. It is one of the most important components of granite. **Hence, option (b) is correct.**

31. Consider the following statements regarding the Marginal Standing Facility (MSF):

1. MSF functions as the last resort for banks to borrow short-term funds over and above that available under the Liquidity Adjustment Facility Window (LAF).
2. MSF is an extraordinary rate at which banks can borrow money from the central bank at a much cheaper rate than repo rate.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: Marginal Standing Facility (MSF) was announced by the Reserve Bank of India (RBI) in its Monetary Policy (2011-12) and **refers to the penal rate at which banks can borrow money from the central bank over and above what is available to them through the LAF window.** MSF, being a penal rate, is always fixed above the repo rate. **Hence, statement 2 is not correct.**

32. Consider the following statements regarding Incremental Capital-Output Ratio (ICOR):

1. The incremental capital output ratio (ICOR) denotes the relationship between the level of investment made in the economy and the consequent increase in the gross domestic product (GDP).
2. The higher the ICOR, the lower the productivity of capital.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: The **Incremental Capital-Output Ratio (ICOR) is the ratio of investment to growth which is equal to the reciprocal of the marginal product of capital.** The higher the ICOR, the lower the productivity of capital or the marginal efficiency of capital. The ICOR can be thought of as a measure of the inefficiency with which capital is used. Hence, both statements are correct.

33. Consider the following statements:

1. Disinvestment involves Selling minority shares of Public Enterprises, to public or private entity.
2. When the government sells majority shares in a public sector entity, that is strategic disinvestment.

3. Under strategic disinvestment, the government transfers the ownership and control of a public sector entity to another public entity and the private sector is not involved here.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: When the **government decides to transfer the ownership and control of a public sector entity to some other entity, either private or public, the process is called strategic disinvestment.** Selling minority shares of Public Enterprises, to another entity be it public or private is disinvestment. In this the government retains ownership of the enterprise. On the other hand, when the government sells majority shares in an enterprise that is strategic disinvestment/sale. Here, the government gives up the ownership of the entity as well. **Hence, statement 3 is not correct.**

34. Consider the following statements with reference to Nominal GDP and Real GDP:

1. Nominal GDP is the money value of all goods and services used in calculating GDP at the current price.
2. The value of all goods and services used in calculating GDP at the base year price is called Real GDP.
3. Nominal GDP is considered as a true indicator of a country's economic growth.
4. Real GDP can never be more than the nominal GDP.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (B)

Explanation: Nominal GDP is the monetary value of the economic output produced during the current year at current year prices. **Hence, statement 1 is correct.** Real GDP reflects the economic output at constant price. In other words, Real GDP is the money value of all the goods and services used in calculating GDP at the base year price. Hence, **statement 2 is correct.**

Real GDP is considered as a true indicator of a country's economic growth because it exclusively considers the rise in production of goods and services as the reason for increase in GDP. Hence, statement 3 is incorrect. Nominal GDP can be less than real GDP if prices in the

current year are less than the prices in the base year. **Hence, statement 4 is incorrect.**

35. Choose the incorrect statement from the following statements:

- (a) Consumer Price Index (CPI) is the index of prices of a given basket of commodities which are bought by the representative consumer.
- (b) The weights of representative goods are constant in GDP Deflator-but they differ according to the production level of each good in CPI.
- (c) The index for wholesale prices is called the Wholesale Price Index (CPI), in the USA it is referred to as Producer Price Index (PPI)
- (d) CPI includes prices of goods consumed by the representative consumer; hence it includes prices of imported goods. GDP deflator does not include prices of imported goods.

Answer: (B)

Explanation: In GDP deflator, the 'basket' in each year is the set of all goods that were produced domestically, weighted by the market value of the total consumption of each good. **Hence, statement (b) is incorrect.**

36. Consider the following statements:

- 1. Recombinant DNA technology involves the insertion of foreign DNA into host organisms.
- 2. Polymerase Chain Reaction is a technique used to amplify DNA sequences.
- 3. CRISPR-Cas9 is a genome-editing tool that uses RNA to target specific DNA sequences.
- 4. Gel electrophoresis is a method used to separate and analyze DNA fragments based on their size.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (D)

Explanation: **Recombinant DNA technology, also known as genetic engineering, is the process of combining DNA from different organisms and inserting it into a host organism.** The goal is to produce new genetic combinations that are useful in science, medicine, agriculture, and industry. **Hence, statement 1 is correct.** Polymerase Chain Reaction (PCR) is a powerful and versatile technique used to amplify specific DNA sequences. It is one of the most important tools in molecular biology and has various applications in research, diagnostics, and forensics. **Hence, statement 2 is correct.** CRISPR-Cas9 is a cutting-edge genome-editing technology that uses short RNA molecules to target specific DNA sequences and

repair genes responsible for genetic diseases. **Hence, statement 3 is correct.** Gel electrophoresis is a laboratory technique that **separates DNA, RNA, or protein mixtures by size.** It's also used to separate and purify proteins and nucleic acids based on their charge, size, or conformation. **Hence, statement 4 is correct.**

37. Consider the following statements about black hole:

- 1. It emit light and other forms of electromagnetic radiation.
- 2. These are regions in space where gravity is so strong that nothing, not even light, can escape.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: Black holes themselves do not emit light or other forms of electromagnetic radiation. However, they can be indirectly detected by observing the effects they have on nearby matter. **As matter falls into a black hole, it forms an accretion disk, and the intense gravitational forces can generate X-rays and other radiation.** So, while black holes don't emit light, their presence can be inferred by the radiation emitted from surrounding matter. **Hence, statement 1 is incorrect.** **Black holes are formed when massive stars collapse under their own gravity, creating regions where the gravitational pull is so strong that nothing, not even light, can escape.** This boundary beyond which nothing can escape is called the event horizon. Anything that crosses this boundary is effectively lost to the external universe, making black holes invisible to direct observation. **Hence, statement 2 is correct.**

38. Consider the following statements:

Statement-I: Quantum computers can perform certain calculations exponentially faster than classical computers.

Statement-II: Quantum computers leverage the principles of superposition and entanglement to process information in parallel.

Which of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement –II is the correct explanation of Statement-I
- (a) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

- (a) Statement-I is correct but Statement-II is incorrect
(a) Statement-I is incorrect but Statement-II is correct

Answer: (A)

Explanation: Quantum computers exploit the principles of quantum mechanics, such as superposition and entanglement, to process information in parallel. This allows them to solve certain types of problems much faster than classical computers, which are limited to sequential processing. **Hence, statement-I is correct.** Superposition allows a quantum bit (qubit) to be in a state of 0 and 1 simultaneously, while entanglement allows qubits to be linked together in a way that classical bits cannot. These unique properties enable quantum computers to perform parallel computations, significantly increasing their processing power. **Hence, statement-II is correct.** By leveraging superposition and entanglement, quantum computers can perform parallel processing, which allows them to solve certain problems exponentially faster than classical computers. **Hence, Statement-II is the correct explanation for Statement-I.**

39. Consider the following statements:

1. The Chernobyl disaster in 1986 was caused by a nuclear fusion reaction gone wrong.
2. Nuclear power plants use control rods to regulate the rate of nuclear reactions.
3. The Fukushima Daiichi nuclear disaster was triggered by a massive earthquake.

How many of the statements given above are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)

Explanation: The Chernobyl disaster was caused by a nuclear fission reaction, not a fusion reaction. **The disaster occurred on April 26, 1986 at the Chernobyl Nuclear Power Plant in the Soviet Union.** The reactor core overheated, causing a steam explosion and fire. The explosion was chemical, driven by gases and steam. **Hence statement 1 is not correct.** Control rods are made of materials that absorb neutrons, thus slowing down the fission chain reaction and controlling the power output of the reactor. Operators can adjust the position of the control rods to maintain a stable power level or shut down the reactor in case of emergencies. **Hence, statement 2 is correct.** In 2011, a powerful earthquake off the coast of Japan led to a tsunami that knocked out the power supply and cooling systems at the Fukushima Daiichi

nuclear power plant. This resulted in overheating of the reactor cores and subsequent meltdowns, releasing radioactive material into the environment. **Hence, statement 3 is correct.**

40. Consider the following in the context of Indian defense Technology :

1. Arjun
2. T-72
3. Akash
4. INS Vikramaditya
5. Pinaka

How many of the above-mentioned are domestically developed in India?

- (a) Only one
(b) Only three
(c) Only four
(d) All five

Answer: (B)

Explanation: Arjun: This main battle tank is completely designed and developed by India's Defence Research and Development Organisation (DRDO). It showcases India's indigenous capability in developing advanced armored vehicles.

Akash: This surface-to-air missile system is also entirely developed by DRDO. It exemplifies India's self-reliance in air defense technology.

Pinaka: This multi-barrel rocket launcher system is another testament to India's indigenous defense technology development. DRDO designed and built this system, making it a significant achievement.

T-72: While India licenses the production of T-72 tanks, the original design and development belong to the Soviet Union. Although India has made some modifications to the design, it remains fundamentally a foreign technology.

INS Vikramaditya: This aircraft carrier was **originally the Soviet Navy's Admiral Gorshkov.** India purchased it from Russia and subsequently refitted it to become INS Vikramaditya. While India has contributed significantly to its modernization, it is not an entirely domestically developed vessel.

41. With reference to 'ecosystem productivity', consider the following statements:

1. Gross primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis.
2. Primary productivity depends on the plant species inhabiting a particular area.
3. Secondary productivity is defined as the rate of formation of new organic matter by consumers.

Which of the statements given above is/are correct?

- (a) Only one
(b) Only two

- (c) All three
- (d) None

Answer: (C)

Explanation: The components of the ecosystem are seen to function as a unit when you consider the following aspects: (i) Productivity; (ii) Decomposition; (iii) Energy flow; and (iv) Nutrient cycling.

A constant input of solar energy is the basic requirement for any ecosystem to function and sustain. Primary production is defined as the amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis. **Gross primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis. A considerable amount of GPP is utilised by plants in respiration. Net primary productivity is the available biomass for the consumption to heterotrophs (herbivores and decomposers). Secondary productivity is defined as the rate of formation of new organic matter by consumers.** Primary productivity depends on the plant species inhabiting a particular area. It also depends on a variety of environmental factors, availability of nutrients and photosynthetic capacity of plants. Therefore, it varies in different types of ecosystems. Hence, all statements are correct.

42. Consider the following statements:

1. Mutualism is an interaction between species in which both benefit.
2. Commensalism is a type of relationship among organisms in which one organism benefits while the other organism is neither benefited nor harmed.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Mutualism is an interaction between species in which both benefit. Commensalism is a type of relationship among organisms in which one organism benefits while the other organism is neither benefited nor harmed. **Hence, both the statements are correct.**

43. Consider the following statements:

1. Pyramid of energy is always inverted, can never be upright.
2. When energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: Pyramid of energy is always upright, can never be inverted, because when energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step. Each bar in the energy pyramid indicates the amount of energy present at each trophic level in a given time or annually per unit area. **Hence, statement 1 is incorrect and statement 2 is correct.**

44. Which of the following are sources of carbon dioxide in atmosphere?

1. Respiration and decomposition
2. Photosynthesis
3. Combustion of fossil fuels
4. Land use changes
5. Volcanic eruptions

Select the correct answer using the code given below:

- (a) 1, 3 and 4 only
- (b) 3, 4 and 5 only
- (c) 1 and 2 only
- (d) 1, 3, 4 and 5

Answer: (D)

Explanation: Land use changes are a substantial source of carbon dioxide emissions globally, accounting for 9% of human carbon dioxide emissions. A minor amount carbon dioxide is created by volcanic eruptions, which accounts for 0.03% of natural emissions. Photosynthesis is not the source of carbon dioxide in atmosphere.

45. Consider the following statements regarding Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

1. CITES is international agreement to regulate worldwide commercial trade in wild animal and plant species.
2. Its aim is to ensure that international trade does not threaten the survival of the species in the wild.
3. CITES is not legally binding on state parties to the convention

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (B)

Explanation: CITES is international agreement to regulate worldwide commercial trade in wild animal and plant species. Its aim is to ensure that international trade does not threaten the survival of the species in the wild. Hence, statement 1 and 2 are correct.

It was drafted as a result of a resolution adopted in 1963 at a meeting of members of the International Union for Conservation of Nature (IUCN). It entered into force in July 1975. CITES is legally binding on state parties to the convention, which are obliged to adopt their own domestic legislation to implement its goals. Hence, statement 3 is incorrect.

46. With reference to the First Carnatic War, consider the following statements:

1. Under the leadership of Captain Barnett, the English Navy took control of the French Navy.
2. Dupleix captured Madras.
3. In the battle of St. Thomas between the British and Nawab Anwaruddin, the Nawab was defeated.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: The First Carnatic War took place between the years 1745-48. The main reason for the war was that the English Navy, under the leadership of Captain Barnett, took over the French Navy. In return Dupleix took control of Madras. Therefore, the British sought help from the Nawab of Karnataka. Due to which the Battle of St. Thomas took place between the Nawab and the French army, in which the Nawab was defeated. Hence, statements 1 and 2 are correct, while statement 3 is incorrect.

47. Consider the following statements:

1. The Portuguese were the first to come to India and the last to leave.
2. Almeida captured Diu in 1509.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: The order of arrival of the European traders to India is Portuguese, Dutch, English, Danish and French, while the Portuguese left India last in 1961.

The Battle of Diu in 1509 saw Portuguese forces

lead by Almeida, defeating a coalition of the Sultan of Gujarat, Zamorin of Calicut, and others. Despite their victory, the Portuguese initially refrained from occupying Diu due to concerns about maintenance costs. However, they eventually took control in 1537, holding it until India liberated the territory in 1961.

Hence, statements 1 is correct and Statement 2 is incorrect.

48. Consider the following statements:

1. Francis Caro founded Pondicherry.
2. French company was established in Surat under the leadership of Francis Martin.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (D)

Explanation: Francois Martin founded Pondicherry in the year 1674. François Martin was the first Governor of Pondicherry. Pondicherry was the capital of the French in India. Francis Caron established the first factory of the French East India Company in Surat in 1667. Francis Caron led an expedition to India. After obtaining a patent from the Sultan of Golconda, in 1669 the Francis Caron built another French workshop at Masulipatnam. Hence, statements 1 and 2 both are incorrect.

49. Consider the following pairs:

Battle of Buxar	Mir Jafar and Clive
Battle of Wandiwash	French and British
Battle of Chillianwala	Dalhousie and Rajput
Battle of Khurda	Nizam and the British

How many of the above pairs are not correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four

Answer: (C)

Explanation: The Battle of Buxar took place on 22 October 1764 between the combined forces of Nawab of Awadh Shuja-ud-Daula, Mughal Emperor Shah Alam and Mir Qasim and the British. The Battle of Wandiwash took place on January 22, 1760 between the British and the French. The French were defeated in this war, this defeat was the beginning of their decline in India. The battle of Chillianwala was fought on January 13, 1849. In this war, the English

army was led by Lord Gough and the Sikh army fought under the leadership of Sher Singh. This war ended inconclusive. At the time of this war, the Governor General of India was Lord Dalhousie. **The battle of Khurda was fought by the Marathas against the Nizam in 1795, in which the Nizam was defeated. Hence, pair 2 is correctly matched, while the other three are not.**

50. Consider the following statements:

1. The Imperial Cadet Corps was established during the time of Lord Curzon.
2. The Indian Archaeological Department was established during the time of Lord Canin.
3. The Ancient India Monuments Act was passed during the time of Lord Curzon.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Lord Curzon established the 'Imperial Cadet Corps' in the year 1901. Its objective was to provide military education to the princes of the native kings and the sons of the landlords. **Hence, statement 1 is correct.** Archaeological survey efforts in India 1784 It began with the **establishment of the Asiatic Society by William Jones in Calcutta.** In 1861, Alexander Cunningham was appointed the first archaeological surveyor by Lord Canning and in 1871, a separate department was created in the government for archaeological survey by Lord Mayo. **Hence, statement 2 is incorrect.** The Ancient Monuments Preservation Act, 1904, Lord Curzon, for the first time in India, allocated a sum of 50,000 pounds paying attention to the protection and repair of historical buildings. **Hence, statement 3 is correct.**

51. Consider the following statements:

1. Due to abundance of silica in the lava, it spreads far and wide.
2. Stromboli in Italy and Puy de Dôme in France are examples of basic lava cones.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (D)

Explanation: The amount of silica in lithic lava is less and it is more fluid and thinner than acid lava.

Therefore it spreads far and wide and forms a cone of low height and gentle slope. The **Maunaloa cone of Hawaii Island is a good example of this. Hence, statement 1 is incorrect.** Acid lava cones are formed from acid lava. The amount of silica in this lava is high, hence it is quite thick and sticky. In this way, immediately after coming out of the volcano, it freezes around its mouth and forms a dome with a steep slope. **Stromboli in Italy and Puy de Dôme in France are good examples of it. Hence, statement 2 is incorrect.**

52. Consider the following pairs:

1. Folding
2. Weathering
3. Volcanic eruption

How many of the above pairs are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) All three pairs
- (d) None

Answer: (B)

Explanation: Folding refers to the bending or deformation of rock layers due to endogenetic forces, such as tectonic plate movements and compression. It is an example of an endogenetic movement. **Hence, pair 1 is correctly matched.** **Weathering is the breakdown and decomposition of rocks at or near the Earth's surface due to exposure to various weathering agents like water, temperature changes and chemical reactions.** Weathering is an example of an exogenetic process. **Hence, pair 2 is correctly matched.** Volcanic eruption involves the discharge of molten rock, ash and gases onto the Earth's surface through volcanic vents or fissures. It is caused by endogenetic processes associated with volcanic activity, making it an example of an endogenetic movement. **Hence, pair 3 is not correctly matched.**

53. Consider the following statements:

1. The regions where seismic waves get recorded are called seismic shadow zones.
2. The shadow region of 'P' waves is wider than that of 'S' waves.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (D)

Explanation: Seismic waves coming from distant places are recorded on the seismograph. Although, there are some areas where no seismic wave is recorded. Such an area is called the seismic shadow zone. The study of various seismic events shows that the shadow zone of one earthquake is completely different from the shadow zone of another earthquake. **Hence, statement 1 is incorrect.** Beyond 105° the 'S' waves do not reach the entire region. **The shadow region of 'S' waves is wider than that of 'P' waves.** From 105° to 145° of the earthquake epicentre, the shadow region of 'P' waves appears as a band around the earth. The shadow region of 'S' waves is not only large in extent, but it covers more than 40 percent of the Earth's surface. **Hence, statement 2 is incorrect.**

54. Which of the following rivers meet directly to the river Indus?

1. Zaskar
2. Beas
3. Gumal
4. Shyok

How many of the above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All Four

Answer: (C)

Explanation: The Indus River is a trans-boundary river in Asia. **It originates in the Tibetan Plateau and flows through India and Pakistan. Several tributaries such as the Zaskar, , the Shyok and the Gumal, etc. join it directly.** The Satluj, the Beas, the Ravi, the Chenab and the Jhelum join together to enter the Indus near Mithankot in Pakistan. **Hence, option (c) is the correct answer.**

55. With reference to active volcano, consider the following statements:

1. Stromboli of the island of Sicily is called the light tower of the Mediterranean Sea.
2. The world's highest active volcano is Cotopaxi.
3. Mauna Loa, located in the south-central part of Hawaii Island, is an example of an active volcano.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: Active volcanoes are those volcanoes from which dust, smoke, vapor, gases, ash, rock fragments, lava, etc. always keep coming out of

their mouth. There are explosions and eruptions from time to time. The Stromboli volcano on the island of Sicily erupts every 15 minutes and is called the lighthouse of the Mediterranean Sea. **Hence, statement 1 is correct.** St. Helena in the United States and Pinatbo in the Philippines are other examples of active volcanoes. **The world's highest active volcano is Cotopaxi.** It is located in the south of Ecuador and is known as the Shining Peak. **Hence, statement 2 is correct.** **Mauna Loa is the largest active volcano in the world.** It is located in the south-central part of the Hawaiian Islands. It is the quintessential shield volcano of its size. **Hence statement 3 is correct.**

56. With reference to the Ryotwari system, consider the following statements:

1. In this system the Ryot or Tenant was the owner of the land.
2. Revenue was not fixed separately for the land owned by the Ryot.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: The Ryotwari system was implemented in Southern Tamil Nadu, Maharashtra, Berar, and Coorg. In this system, the Ryot or Tenant was the owner of the land and there was no intermediary between him and the state. The Ryot had the right to sell, transfer, mortgage, lease and gift land. As long as he continued to pay the land revenue fixed at the time of settlement, he could not be evicted. Tenants did not have these rights in the Zamindari system. **Hence, statement 1 is correct.** In the Ryotwari system the settlement was temporary. **Revenue was fixed separately for the land owned by the Ryot. The settlement was made for 20 years in Madhya Pradesh , for 30 years in Bombay (Maharashtra) and for 40 years in Madras (Tamil Nadu) and United Province (Uttar Pradesh).** **Hence, statement 2 is incorrect.**

57. Consider the following statements:

1. India is one of the countries where there are specialized courts for redressal of consumer related problems.
2. Consumer Protection Act was amended in 2015 to strengthen the rights of consumers.

Which of the statements given above is/are incorrect?

- (a) 1 only
- (b) 2 only

- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: A consumer is a person who buys goods or services for himself or someone else. **24th December is celebrated as National Consumer Day in India.** In 1986, the Indian Parliament passed the Consumer Protection Act. India is one of those countries where there are many ways to solve consumer related problems. There are special courts for this. **Hence, statement 1 is correct.** At present, there are more than **2000 consumer organizations in the country, out of which only 50-60 are fully organized and recognized for their functions.** Yet, the consumer redress process is proving to be complex, expensive and time consuming. Consumer Protection Act (COPRA) was amended in 2019 to strengthen consumer rights. **Hence, statement 2 is incorrect.**

58. Which committee was constituted by the Government of India in 1991 to study the structure of direct and indirect taxes?

- (a) Kelkar Committee
- (b) Rekhi Committee
- (c) Chelaiya Committee
- (d) Yashwant Sinha Committee

Answer: (C)

Explanation: On **August 29, 1991, the Government of India constituted a committee under the chairmanship of Raja J. Chelaiya to study the structure of direct and indirect taxes.** This committee made many important recommendations in its report, some of which were later implemented. Some important issues include, increasing the elasticity of all types of taxes, direct and indirect, increasing the share of direct taxes in gross tax revenue and GDP, making the tax system more equitable and broad based by changes in tax rates, Rationalizing the direct tax system so as to remove its inconsistencies and strengthen economic incentives, exploring new areas for taxation, etc. **Hence, option (c) is the correct answer.**

59. Consider the following pairs:

- Invisible Trade
- Non-gratuity income
- Trade deficit

How many of the above pairs are correctly matched ?

- (a) Only one
- (b) Only two

- (c) Only three
- (d) All four

Answer: (D)

Explanation: Invisible trade is international transactions that do not involve the exchange of tangible goods. In this there is import and export of services. **Hence, pair 1 is not correctly matched.** Trade in services includes both gratuity and non-gratuity income. Gratuity income includes net international income derived from factors of production such as expenditure, land and capital. Net sales received from service products like shipping, banking, tourism, software services etc. are called non-gratuity income. **Hence, pair 2 is not correctly matched.**

A trade deficit occurs when a country imports more goods and services than it exports to its trading partner. Trade deficit is also called negative balance of trade. **Hence, pair 3 is not correctly matched.**

60. With reference to Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), consider the following statements:

1. Under this Act, the objective is to provide 120 days of guaranteed wage employment every year.
2. Under this, one-third employment has been secured for women.
3. MNREGA was started in the year 2005.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Mahatma Gandhi National Rural Employment Act 2005 (MNREGA) is to provide wage employment for at least 100 days to every household to secure livelihood in rural areas. **Hence, statement 1 is correct.** Its **objective is to help in sustainable development so that problems like drought, deforestation and soil erosion can be avoided.** Under this provision, one-third employment has been reserved for women. **Under the National Employment Guarantee Fund established by the Central Government, if the applicant is not provided employment within 15 days, he/she will be entitled to daily unemployment allowance.** **Hence, statement 2 is correct.** The NREGA Act, passed by the Indian Parliament in August 2005, implemented in various states of the country on 2 February 2006 and was renamed MNREGA on 2 October 2009. **Hence, statement 3 is incorrect.**

61. Consider the following statements:

1. The process of respiration in plants involves the breakdown of glucose to release energy.
2. Stomata are tiny openings in the epidermis of leaves that regulate gas exchange.
3. Xylem is responsible for the transport of organic nutrients within the plant.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (B)

Explanation: The process of respiration in plants involves the breakdown of glucose to release energy. This process occurs in the mitochondria of plant cells and is essential for the plant's survival and growth. The **overall chemical equation for cellular respiration in plants is: $C_6H_{12}O_6$ (glucose) + $6O_2$ (oxygen) \rightarrow $6CO_2$ (carbon dioxide) + $6H_2O$ (water) + Energy** Hence, **statement 1 is correct.**

Stomata are indeed tiny openings in the epidermis of leaves that regulate gas exchange. They allow the plant to take in carbon dioxide, which is needed for photosynthesis, and release oxygen, which is a byproduct of photosynthesis. Additionally, stomata play a crucial role in water vapor exchange, helping the plant regulate its temperature. **Hence statement 2 is correct**

Xylem is primarily responsible for transporting water and dissolved minerals throughout the plant. It does not transport organic nutrients, which are primarily transported by phloem. **Hence statement 3 is not correct**

62. Consider the following statements:

Statement-I: ELISA is a technique used for the detection of specific proteins.

Statement-II: ELISA involves the use of an enzyme-labeled antibody for detection.

Which of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct, and Statement-II is the correct explanation for Statement-I.
- (b) Both Statement-I and Statement-II are correct, but Statement-II is not the correct explanation for Statement-I.
- (c) Statement-I is correct, but Statement-II is incorrect.
- (d) Statement-I is incorrect, but Statement-II is correct.

Answer: (B)

Explanation: The enzyme-linked immunosorbent assay (ELISA) is an immunological assay commonly used to measure antibodies, antigens, proteins and glycoproteins in biological samples. **Hence, statement-I is correct.**

ELISA, relies heavily on an enzyme-tagged antibody for detection. This antibody binds the target molecule, triggering an enzyme reaction that amplifies a signal, making even low concentrations of the target readily visible. This allows ELISA to not only detect, but also quantify the target molecule, making it a valuable tool in research and diagnostics. Hence, statement-II is correct. **Therefore, both statements are correct.**

While Statement-II describes a key step in the ELISA process, it doesn't fully explain how ELISA detects specific proteins.

63. Consider the following statement:

1. Augmented Reality (AR) allows users to interact with the real world while overlaying digital information.
2. In Virtual Reality (VR), the physical environment is completely replaced by a virtual simulation.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Augmented Reality (AR) overlays digital information onto the real world, allowing users to interact with both simultaneously. This is demonstrably true in games like Pokémon Go, where virtual creatures appear in the user's real environment. **Hence, statement 1 is correct** **Virtual reality (VR) creates a simulated environment that replaces the physical world.** VR is a computer-generated simulation of an alternate reality. It's used in 3D movies, video games, training, education, science, and virtual tours. **Hence, statement 2 is correct**

64. It has a four-stage system comprising a combination of solid and liquid-fuelled rocket stages. The first stage at the very bottom is solid fuelled having six strap-on solid rocket boosters wrapped around it. Second stage is liquid fuelled whereas the third stage has a solid fuelled rocket motor. At the fourth stage, the launcher uses a liquid propellant to boost in the outer space. It has got highest success rate and considered as work horse of ISRO.

The above paragraph is about to which of the following:

- (a) GSLV
- (b) PSLV
- (c) SLV
- (d) None of the above

Answer: (B)

Explanation: PSLV boasts a remarkable success rate of over 97%, making it one of the most reliable launch vehicles in operation. This, along with its versatility and affordability, has earned it the title of "workhorse" for ISRO, responsible for numerous successful launches throughout its history.

65. Consider the following statements:

1. DRDO is responsible for the development of indigenous defense technologies.
2. BrahMos is a joint venture between India and Russia for the development of supersonic cruise missiles.
3. HAL is the primary aerospace and defense company in India.
4. Tejas is an indigenous multi-role light combat aircraft developed by India.

How many of the statements given above are correct?

- (a) Only one
- (b) Only three
- (c) Only four
- (d) None of the above

Answer: (C)

Explanation: The Defense Research and Development Organization (DRDO) plays a crucial role in enhancing India's self-reliance in the defense sector. They are responsible for developing various cutting-edge technologies, systems, and products for the Indian Armed Forces. Hence, statement 1 is correct. BrahMos is a joint venture between India and Russia for the development, production, and marketing of supersonic cruise missiles. Hence, statement 2 is correct. Hindustan Aeronautics Limited (HAL) is an Indian public sector aerospace and defence company, headquartered in Bangalore. Established on 23 December 1940, HAL is one of the oldest and largest aerospace and defence manufacturers in the world. Hence statement 3 is correct. Tejas is an indigenous multi-role light combat aircraft developed by India. The project was undertaken by the Aeronautical Development Agency (ADA) in collaboration with Hindustan Aeronautics Limited (HAL). Hence, statement 4 is correct.

66. Consider the following pairs:

Ramsar Site	State
1. Sirpur wetland	Madhya Pradesh

2. Nanda Lake	Uttarakhand
3. Saman Bird Sanctuary	Uttar Pradesh
4. Shallbugh Wetland	Sikkim

How many of the above pairs are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs

Answer: (B)

Explanation:

Ramsar Site	State
1. Sirpur wetland	Madhya Pradesh
2. Nanda Lake	Goa
3. Saman Bird Sanctuary	Uttar Pradesh
4. Shallbugh Wetland	Jammu & Kashmir

67. With reference to Birdlife International, consider the following statements:

1. It is a global partnership of conservation organisations that strives to conserve birds, their habitats and global biodiversity, working with people towards sustainability in the use of natural resources.
2. BirdLife International publishes an annual magazine, World Birdwatch, which contains recent news and authoritative articles about birds, their habitats, and their conservation around the world.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: Birdlife International is a global partnership of conservation organisations that strives to conserve birds, their habitats and global biodiversity, working with people towards sustainability in the use of natural resources. It is world's largest conservation partnerships for conservation of birds and their habitats. It was earlier known as International Committee for Bird Preservation. Hence, statement 1 is correct. It publishes a quarterly magazine, World Birdwatch, which contains recent news and authoritative articles about birds, their habitats, and their conservation around the world. It is the official Red List authority for birds, for the International Union for Conservation of Nature. It also published important bird areas (IBA) inventory. Hence, statement 2 is not correct.

68. Consider the following statements regarding Fly Ash:

1. Fly ash is an unwanted unburnt residue of coal combustion in a coal thermal power plant.
2. It is used in concrete and cement products, road base, metal recovery, and mineral filler among others.
3. Fly Ash does not contain any toxic elements.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Fly ash is an unwanted unburnt residue of coal combustion in a coal thermal power plant. It is emitted along with flue gases during the burning of coal in a furnace and collected using the electrostatic precipitators. **The fly ash collected with the help of precipitators is converted into wet slurry to minimise fugitive dust emissions.** Composition of fly ash depends upon the composition of coal being burnt. It may contain Beryllium, Arsenic, unburnt Carbon, Silicon Oxides, Dioxins, aluminium oxide, ferric oxide, calcium oxide, etc. These elements are severe environmental pollutants. It is used in concrete and cement products, road base, metal recovery, and mineral filler among others. **Fly ash particles are toxic air pollutants.** They can trigger heart disease, cancer, respiratory diseases and stroke. **Hence, statement 3 is not correct.**

69. Consider the following statements regarding Eutrophication:

1. Eutrophication is when a body of water becomes overly enriched with minerals and nutrients that induce excessive growth of plants and algae.
2. Increase of phytoplankton in a water body is the response to increased levels of nutrients.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Eutrophication or hypertrophication, is when a body of water becomes overly enriched with minerals and nutrients that induce excessive growth of plants and algae. This process may result in oxygen depletion of the water body. **One example is an "algal bloom"** or great increase of phytoplankton in a water body as a response to increased levels of nutrients. Eutrophication is often induced by the

discharge of nitrate or phosphate-containing detergents, fertilizers, or sewage into an aquatic system. **Hence, both statements are correct.**

70. Consider the following statements:

1. An ecotone is a zone of junction or a transition area between two biomes (diverse ecosystems).
2. The organisms which occur primarily or most abundantly in this zone are known as edge species.
3. Niche refers to the unique functional role and position of a species in its habitat or ecosystem.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: Ecotone: An ecotone is a zone of junction or a transition area between two biomes (diverse ecosystems). Ecotone is the zone where two communities meet and integrate. For e.g. the mangrove forests represent an ecotone between marine and terrestrial ecosystem.

Ecocline: It is a zone of gradual but continuous change from one ecosystem to another when there is no sharp boundary between the two in terms of species composition. Ecocline occurs across the environmental gradient (gradual change in abiotic factors such as altitude, temperature (thermocline), salinity (halocline), depth, etc.).

Edge Effect –Edge effect refers to the changes in population or community structures that occur at the boundary of two habitats (ecotone). Sometimes the number of species and the population density of some of the species in the ecotone is much greater than either community. This is called edge effect. The organisms which occur primarily or most abundantly in this zone are known as edge species. In the terrestrial ecosystems edge effect is especially applicable to birds. For example, the density of birds is greater in the ecotone between the forest and the desert.

Ecological Niche: Niche refers to the unique functional role and position of a species in its habitat or ecosystem. Niche plays an important role in the conservation of organisms. If we have to conserve species in its native habitat, we should have knowledge about the niche requirements of the species. No two species in a habitat can have the same niche. This is because of the competition with one another until one is displaced. **Hence, all statements are correct.**

71. Consider the following statements, with reference to Standing Committees:

1. Standing committees are permanent and works on a continuous basis.
2. A minister is not eligible to be nominated as a member of any of the standing committees.
3. These committees should consider the matters of day-to-day administration of the concerned ministries.
4. The recommendations tendered by these committees are permanent and binding on the Parliament.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (B)

Explanation: Standing Committees are permanent and works on a continuous basis. **Its main objective is to secure more accountability of the executive to the Parliament, particularly financial accountability. Hence, statement 1 is correct.** A minister is not eligible to be nominated as a member of any of the standing committees. In case a member, after his nomination to any of the standing committees, is appointed as minister, he then ceases to be a member of the committee. **Hence, statement 2 is correct.**

They should not consider the matters of day-to-day administration of the concerned ministries/departments. **Hence, statement 3 is incorrect.** Also, they should not generally consider the matters which are considered by other Parliamentary committees. **The recommendations of these committees are advisory in nature and Hence, not binding on the Parliament. Hence, statement 4 is incorrect.**

72. Consider the following statements:

Statement I - The courts in India consider "due process of law" in addition to the "procedure established by law" while interpreting Article 21.
Statement II - The inclusion of "due process of law" ensures that the procedure followed is fair, just, and reasonable, protecting the rights of individuals.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement - I and Statement - II are correct and Statement - II is the correct explanation for Statement-I
- (b) Both Statement - I and Statement - II are correct and Statement - II is not the correct explanation for Statement - I
- (c) Statement - I is correct but Statement - II is incorrect
- (d) Statement - I is incorrect but Statement - II is correct

Answer: (A)

Explanation: The courts in India do consider "due process of law" in addition to the "procedure established by law" while interpreting Article 21. This means that they not only focus on whether the prescribed legal procedure has been followed but also ensure that the procedure is fair, just, and reasonable. **Hence statement – I is correct.** The inclusion of "due process of law" ensures that the procedure followed is fair, just, and reasonable, thereby protecting the rights of individuals. **By incorporating "due process of law," the legal system aims to prevent arbitrary or unjust actions that may infringe upon an individual's rights.** It guarantees that individuals are provided with fundamental safeguards and protections during legal proceedings, contributing to the overall fairness and justice of the procedure. **Hence statement – II is correct.**

Thus, Both Statement - I and Statement - II are correct and Statement - II is the correct explanation for Statement-I.

73. With reference to the President of India, consider the following statements:

1. It is mandatory for the President to work with the aid and advice of the Council of Ministers.
2. When the Council of Ministers resigns, the President acts as per his discretion.

Which of the above statements is/are correct?

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: According to Article 74(1) of the Indian Constitution, "There shall be a Council of Ministers with the Prime Minister at the head to aid and advise the President in the exercise of his functions." This means that, in most cases, the President is bound to act based on the advice of the Council. **Hence, statement 1 is correct.** When the Council of Ministers resigns, the President acts as per his discretion. This is because a resignation creates a vacuum in the executive branch. The President has the power to call upon the Council to continue in office until a new government is formed or dissolve the Lok Sabha and call for fresh elections. **Hence, statement 2 is correct.**

74. With reference to the Charter Act, 1813, consider the following statements:

1. By this act the trading monopoly of the British East India Company (the monopoly on the trade with China and tea remained) was abolished.

2. In this act, a provision of one lakh rupees was made every year for the spread of education in India.
3. The revenue of India came under the control of the British Parliament.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: By the **Charter Act, 1813 the trading monopoly of the British East India Company (the monopoly on the trade of China and tea remained) was abolished.** Also, through this act, the sovereignty of the British Crown over the Indian territories occupied by the Company was also strengthened. **Hence statement 1 is correct.** In this act, a provision of one lakh rupees was made every year for the spread of education in India. In 1823, the General Committee of Public Instruction was formed, in whose responsibility there was a provision of giving one lakh rupees for education, so **statement 2 is also correct.** The revenue of India was brought under the direct control of the British Parliament by the Act of 1858 AD. **Hence statement 3 is not correct.**

75. With reference to the Constitution Amendment Bill, consider the following statements:

1. The Constitution Amendment Bill must be passed by a two-thirds majority of the members of each House present and voting.
2. A deadlock arising out of disagreement between the two Houses on such a Bill should be resolved by a joint sitting of both the Houses.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 Nor 2

Answer: (A)

Explanation: The bill must be passed by a special majority in each House i.e. by a majority (i.e. more than 50%) of the total membership of the House and by a two-thirds majority of the members present and voting from the House. **Hence statement 1 is correct.** Each house has to pass the bill separately. In case of disagreement between the two Houses, there is no provision for holding a joint sitting of both the Houses for the purpose of deliberation and passing of the Bill. **Hence statement 2 is not correct.**

76. Consider the following statements:

1. P-waves or 'primary waves' move faster and are the first to arrive at the surface whereas S-waves or secondary waves arrive at the surface with some time lag.
2. P-waves can travel only through solid materials whereas S-waves can travel through gaseous, liquid and solid materials.
3. P-waves are considered to be the most damaging waves.

Which of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Release of energy during earthquake generates waves which are called Earthquake Waves. **Earthquake waves are basically of two types — body waves and surface waves.** **Body waves:** They are **generated due to the release of energy at the focus and move in all directions travelling through the body of the earth. Hence, the name body waves.** The body waves interact with the surface rocks and generate new set of waves called surface waves.

Surface waves: These waves move along the surface. The velocity of waves changes as they travel through materials with different densities. The denser the material, the higher is the velocity. Their direction also changes as they reflect or refract when coming across materials with different densities. **There are two types of body waves. They are called P and S-waves. P-waves or 'primary waves' move faster and are the first to arrive at the surface.** The P-waves are similar to sound waves. **They travel through gaseous, liquid and solid materials.** P-waves vibrate parallel to the direction of the wave. This exerts pressure on the material in the direction of the propagation. As a result, it creates density differences in the material leading to stretching and squeezing of the material. **S-waves or secondary waves arrive at the surface with some time lag. They can travel only through solid materials.** This characteristic of the S-waves is quite important. It has helped scientists to understand the structure of the interior of the earth. The direction of vibrations of S-waves is perpendicular to the wave direction in the vertical plane. Hence, they create troughs and crests in the material through which they pass. Surface waves are considered to be the most damaging waves. **Hence, only statement 1 is correct.**

77. Consider the following statements regarding Sunspots:

1. Sunspots are areas that appear dark on the surface of the Sun (photosphere). They appear dark because they are hotter than other parts of the Sun's surface.
2. They are regions of reduced surface temperature caused by concentrations of magnetic field flux that inhibit convection.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: Sunspots (some as large as 50,000 km in diameter) are areas that appear dark on the surface of the Sun (photosphere). They appear dark because they are cooler than other parts of the Sun's surface. However, the temperature of a sunspot is still very hot —around 6,500 degrees Fahrenheit. They are regions of reduced surface temperature caused by concentrations of magnetic field flux that inhibit convection. Photosphere is a visible surface of the Sun, from which is emitted most of the Sun's light that reaches Earth directly. They are relatively cool because they form at areas where magnetic fields are particularly strong. These magnetic fields are so strong that they keep some of the heat within the Sun from reaching the surface. Hence, statement 1 is not correct and statement 2 is correct.

78. Consider the following statements regarding Intertropical Convergence Zone (ITCZ):

1. The ITCZ is a zone of convergence at the thermal equator where the trade winds meet.
2. It is a zone where air tends to ascend.
3. It is a low pressure belt and migrates with the changing position of the thermal equator.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: The ITCZ is a zone of convergence at the thermal equator where the trade winds meet and it is a zone where air tends to ascend. It is a low pressure belt and migrates with the changing position of the thermal equator. In July, the ITCZ is located around 20°N-25°N latitudes (over the Gangetic plain), sometimes called the monsoon trough. This monsoon trough encourages the development of thermal low over north and northwest India. Due to the shift of ITCZ, the trade winds of the southern hemisphere cross the equator between 40° and 60°E longitudes and start blowing

from southwest to northeast due to the Coriolis force. Hence, statement 2 is correct.

79. The tropical cyclones do not occur close to the equator because of:

- (a) Weak coriolis force
- (b) Light and variable winds
- (c) Excessive humidity
- (d) Convective activity

Answer: (A)

Explanation: Tropical cyclones are violent storms that originate over oceans in tropical areas and move over to the coastal areas bringing about large scale destruction caused by violent winds, very heavy rainfall and storm surges. This is one of the most devastating natural calamities. Presence of the Coriolis force is one of the important conditions favourable for the formation and intensification of tropical storms. Since, there is weak coriolis force close to equator, then tropical cyclone does not occur close to the equator.

80. It was formed due to Ocean-Continent collision. Average height of this mountain is 4,000 m. It is longest continental mountain range in the world. It is the world's highest mountain range outside of Asia.

The above passage is related to which of the following mountain?

- (a) Rocky Mountains
- (b) Andes Mountains
- (c) Ural Mountains
- (d) Appalachian Mountain

Answer: (B)

Explanation: The Andes is the longest continental mountain range in the world. It is formed due to Ocean-Continent collision. The average height of this mountain is 4,000 m. It spreads along Venezuela, Colombia, Ecuador, Peru, Bolivia, Chile, and Argentina. The Andes is the world's highest mountain range outside of Asia. The highest peak, Mount Aconcagua, rises to an elevation of about 6,962 m above sea level. World's highest volcanoes are in the Andes. Ojos del Salado (6,893 m) on the Chile-Argentina border is the highest volcano on earth. Hence, option (b) is correct.

81. With reference to Central Bank Digital Currency (CBDC), consider the following statements:

1. CBDCs are a digital form of a paper currency and are legal tenders issued and backed by a central bank.
2. Unlike Mobile money, CBDC cannot be used by the consumers for performing retail payments.
3. CBDCs are similar to stablecoins, except that their value is fixed by the central bank and equivalent to the country's fiat currency.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Recently, the Reserve Bank of India (RBI) Governor has highlighted the potential of Central Bank Digital Currency (CBDC) or E-rupee in improving cross-border payments' efficiency. **CBDCs are a digital form of a paper currency and unlike crypto currencies that operate in a regulatory vacuum, these are legal tenders issued and backed by a central bank.** CBDCs possess unique attributes that can revolutionize cross-border transactions. Instant settlement feature of CBDCs as a significant advantage, making cross-border payments cheaper, faster, and more secure. **Hence, statement 1 is correct.**

CBDC is a digital version of fiat currency issued by the central bank, and mobile money is a digital payment system that allows users to perform financial transactions using their mobile devices, both are designed to facilitate digital payments within a country's domestic economy. Both CBDC and mobile money wallets are meant to facilitate domestic retail payments. **Hence, statement 2 is not correct.** CBDCs are similar to stablecoins, except that their value is fixed by the central bank and equivalent to the country's fiat currency. **Stablecoins are crypto currencies backed by a reserve asset like fiat currency or a commodity. Their value is based on people's trust in the company holding collateral assets. Hence, statement 3 is correct.**

82. Consider the following statements:

1. Inclusion promotes equal opportunities for individuals, regardless of their background.
2. Demographics include information on the size and growth rate of a population.
3. Fiscal Policy is a static framework that remains unchanged over time.
4. Social issues encompass only economic challenges faced by individuals.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (B)

Explanation: Inclusion is a critical concept that aims to create a society where everyone has a sense of belonging and equal access to opportunities, regardless of their background characteristics. This

includes factors such as: Race and ethnicity, Gender and sexual orientation, Disability, Socioeconomic status, Religion and beliefs, Age, National origin.

Hence, statement 1 is correct.

Demographics encompass a broad range of data about a population, including its size, age structure, ethnicity, education level, income, and more. This data can be used to understand population trends, make informed decisions, and allocate resources.

Hence, statement 2 is correct.

Fiscal policy is a dynamic tool used by governments to influence the economy through taxes and spending. It is constantly evolving and adapted to address changing economic conditions and priorities.

Hence, statement 3 is not correct.

Social issues are far more complex than just economic challenges faced by individuals. While economic concerns are certainly a significant aspect of many social issues, they are only one piece of the puzzle. **Hence, statement 4 is not correct.**

83. With reference to Special Drawing Right (SDR), consider the following statements:

1. The SDR is neither a currency nor a claim on the IMF.
2. International Monetary Fund (IMF) gives equal weightage to the basket of currencies to determine SDR value.
3. It can be held and used by member countries, private entities or individuals.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: The SDR is neither a currency nor a claim on the IMF. Rather, it is a potential claim on the freely usable currencies of IMF members. SDRs can be exchanged for these currencies. The SDR serves as the unit of account of the IMF and some other international organizations. **Hence, statement 1 is correct.**

All the five currencies (Chinese yuan, US dollar, euro, Japanese yen, and British pound sterling) have different weightage with the US dollar having the highest weightage. Hence, statement 2 is not correct.

Individuals and private entities cannot hold SDRs. IMF members – and the IMF itself – hold SDRs and the IMF has the authority to approve other holders, such as central banks and multilateral development banks, while individuals and private entities cannot hold SDRs. **Hence, statement 3 is not correct.**

84. With reference to Cash Reserve Ratio (CRR), consider the following statements:

Cash Reserve Ratio (CRR) is the share of a bank's total deposit that is mandated by the Reserve Bank of India (RBI) to be maintained with the latter as reserves in the form of liquid cash.
2. CRR applies to scheduled commercial banks, regional rural banks and NBFCs.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: Cash Reserve Ratio (CRR) is the share of a bank's total deposit that is mandated by the Reserve Bank of India (RBI) to be maintained with the latter as reserves in the form of liquid cash. The bank cannot use this amount for lending and investment purposes and does not get any interest from the RBI. CRR applies to scheduled commercial banks, while the regional rural banks and NBFCs are excluded. CRR helps control inflation. In a high-inflation environment, RBI can increase CRR to prevent banks from lending more. **Hence, statement 2 is not correct.**

85. With reference to Purple Economy, consider the following statements:

1. It is an economic model that recognizes the importance of care work and the empowerment of women to the functioning of economies, the well-being of societies, and the sustainability of life.
2. The examples of the purple economy include Digital, Tourism, Luxury goods, and Housing.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Shanti Raghavan, the recipient of the Business Line Changemakers Award in 2020, leads the organization EnAble India. They are working on creating a 'purple economy,' which promotes disability inclusion and job opportunities on a large scale. **Care Economy refers to the economic activities related to providing care and support services, often in healthcare, childcare, elderly care, and other areas aimed at improving people's well-being.** It encompasses both paid and unpaid care work and is a critical aspect of social and economic

development. The purple economy is an economic order that focuses on the sustainability of caring labour. It's an alternative vision that complements the green economy. **The purple economy aims to:**

- Organize the system around the sustainability of caring labour
 - Address the inequalities created by the disproportionate reliance on women's unpaid and underpaid labour
 - Contribute to sustainable development by promoting the cultural potential of goods and services
 - Contribute to a richer and more diverse cultural environment
- Examples of the purple economy include Digital, Tourism, Luxury goods, and Housing. **Hence, both statements are correct.**

86. Consider the following statements:

1. Gene therapy is an artificial method that introduces DNA into the cells of the human body.
2. CRISPR/Cas9 technology has the potential to revolutionise the treatment of many paediatric conditions.

How many of the statements given above are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: Gene therapy is a technique that involves replacing defective genes with healthy genes to treat genetic disorders. It is **an artificial method which allows entry of DNA into the cells of the human body. The first gene therapy was successfully conducted in the year 1989. Hence, statement 1 is correct** CRISPR/Cas9 is a gene editing technology that allows DNA to be altered with great precision. This technology is still under development, but it has the potential to make significant advances in the treatment of many pediatric conditions. CRISPR/Cas9 can be used to treat a variety of pediatric conditions, including genetic disorders, cancer, immunodeficiency, and more. **Hence, statement 2 is correct.**

87. It is a technology where machines learn to perform tasks rather than simply completing calculations input by human users. Its early applications included machines that could play games such as checkers and chess, and programs that could reproduce language. This technology refers to the ability of computers or computer-controlled robots to perform tasks that are normally performed by humans.

The above passage explains which of the following techniques?

- (a) Artificial intelligence
- (b) Machine learning
- (c) Neural network
- (d) Deep learning

Answer: (A)

Explanation: The passage describing Artificial intelligence (AI). It is a vast field of computer science that focuses on creating intelligent machines capable of performing tasks typically requiring human intelligence. The early applications of AI, as mentioned in the passage, included game-playing programs and language translation systems. However, AI has now become much more sophisticated and is used in a wide variety of applications.

88. Consider the following:

- 1. Medicine
- 2. Agriculture
- 3. Electronics
- 4. Food items
- 5. Fuel
- 6. Solar Battery

In which of the above mentioned areas application of Nanotechnology is possible?

- (a) Only three
- (b) Only four
- (c) Only five
- (d) All six

Answer: (D)

Explanation: Application of nanotechnology is possible in all the following areas:

- Treatment
- Agriculture
- Electronics
- Food ingredient
- Fuel
- Solar battery
- Environment
- Defence
- Construction
- Technology

Nanotechnology is a rapidly growing field, and the possibilities for its applications are limitless.

89. Consider the following statements:

- 1. Currently, Over-the-Top platforms and portals in India are regulated by the Information Technology Act, 2002.
- 2. There is immense potential for implementing Internet of Things in the Indian agricultural scenario.
- 3. Deep web websites can be accessed with the help of Tor browser.
- 4. Srikrishna Committee was

entrusted with the task of drafting a data protection law for India.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (C)

Explanation: "Over-the-top" (OTT) media service refers to an online platform that makes streaming media available as an independent product. The Information Technology Act, 2002 does not contain any specific rules or guidelines for over-the-top platforms and portals. For this reason, there is often controversy regarding the content available on these platforms. The government recently proposed a new policy to regulate over-the-top platforms and portals. Under this policy, more strict rules and guidelines will be implemented regarding the content available on these platforms. Hence statement 1 is not correct. Many improvements can be made to the Indian agricultural landscape by using the Internet of Things (IoT). For example, IoT can be used in crop production, water management, and animal husbandry. Hence statement 2 is correct. Tor Browser is an open-source web browser that uses encryption to hide a user's identity and location. This is necessary to access the Deep Web and Dark Web as these websites are separate from the public Internet. Hence statement 3 is correct. Srikrishna Committee was appointed to prepare a data protection law for India. The committee had submitted its report in 2018. Hence statement 4 is correct.

90. Consider the following pairs in the Indian context:

(Act)	(Year)
1. Patent Act	1970
2. Trademark Act	1999
3. Copyright Act	1957

How many of the above pairs are not correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (D)

Explanation: The Indian Patent Act is the law relating to patents in India. This act was passed in 1970. Hence pair 1 is correct. The Indian Trademark Act is the law relating to

trademarks in India. This act was passed in 1999. **Hence pair 2 is correct.** The Indian Copyright Act is the law relating to copyright in India. This act was passed in 1957. **Hence pair 3 is correct.**

91. Consider the following:

1. Increased exposure to ultraviolet (UV) radiation.
2. Large amounts of storm water from heavy rains flooding the reef.
3. Sediments such as sand or dirt covering the coral.

How many of the above are the causes of coral bleaching?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: The whitening of coral colonies due to the loss of symbiotic zooxanthellae from the tissues of polyps is called as Coral Bleaching. **Zooxanthellae are unicellular algae that provide colour to corals.** They also provide food to corals and their deaths lead to breakdown of the symbiotic relationship between them. This breakdown of symbiotic relationship causes starvation and resultant deaths of coral polyps. **This condition exposes the white calcium carbonate skeletons of the coral colony.**

Causes of Coral Bleaching:

- 1. Extreme climate conditions:** High temperature of water leads to the declination of these corals as they cannot survive in high temperatures. As estimated by scientists, most of the coral reefs of the world will soon decline with the increasing rates of ocean warming.
- 2. Ocean Acidification:** Oceans absorb more carbon dioxide due to a rise in CO₂ levels. This increases the acidity of ocean water. This inhibits the corals' ability to create calcareous skeletons that essential for their survival.
- 3. Pollution:** The toxic pollutants which are dumped directly into the ocean can lead to the poisoning of the coral reefs as it increases the nitrogen level of the seawater, leading to an overgrowth of algae.
- 4. Sedimentation:** Construction along the coasts and islands lead to soil erosion, increasing the sediments in the river. As a result, it can smother corals by depriving them of the light needed to survive.
- 5. Infectious Diseases:** *Vibrio shiloi* is a bacterium that inhibits the photosynthesis of zooxanthellae. This bacterium becomes more potent with an increase in sea temperatures.
- 6. Coastal development:** Development of coastal infrastructure and tourist resorts on or close by these

coral reefs causes significant damages. **7. Human activities:** Over-fishing, coral mining, development of industrial areas near coral ecosystems etc. impact coral ecosystem.

92. Consider the following statements regarding Mangroves:

1. Mangroves are very specialised forest ecosystems of tropical and subtropical regions bordering certain sea coasts.
2. They do not grow in low-oxygen soil.

Which of the above statements is/are not correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (B)

Explanation: Mangroves are a group of trees and shrubs, sustaining in the coastal regions of the planet. **These trees grow in low-oxygen soil with slow-moving water.** These ecosystems of tropical and subtropical inter-tidal regions bordering the sheltered sea coasts and estuaries, they **stabilize the shoreline and act as a bulwark against encroachments by the sea.** Hence, statement 2 is not correct.

93. Consider the following statements about the umbrella species:

1. An umbrella species is a large animal or other organism on which many other species depend.
2. Tigers in India is an example of umbrella species.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: An Umbrella species is a large animal or another organism on which many other species depend. **Umbrella species are very similar to keystone species, but umbrella species are usually migratory and need a large habitat.** Umbrella species are species selected for making conservation related decisions, typically because protecting these species indirectly protects the many other species that make up the ecological community of its habitat. **In India, the Bengal tiger is the most prominent umbrella species. Hence, both statements are correct.**

94. Consider the following statements regarding Convention on Biological Diversity (CBD):

1. The Convention on Biological Diversity (CBD) is the first comprehensive global agreement addressing all aspects relating to biodiversity
2. Biodiversity as a global issue gained importance at the 2002 Rio+10 summit where world leaders agreed on a comprehensive strategy for “sustainable development”.
3. The objective of the Convention are conservation of biological diversity; sustainable use of its components and fair and equitable sharing of the benefits arising from the use of genetic resources

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (B)

Explanation: Biodiversity as a global issue gained importance at the 1992 Earth Summit in Rio de Janeiro, Brazil where world leaders agreed on a comprehensive strategy for “sustainable development”. One of the key agreements adopted at Rio was the ‘Convention on Biological Diversity’ (CBD) which was signed by vast majority of the world’s governments showing commitments for maintaining the world’s ecological foundations as economic development proceeds worldwide. The objective of the Convention is conservation of biological diversity; sustainable use of its components and fair and equitable sharing of the benefits arising from the use of genetic resources. **The CBD is the first comprehensive global agreement addressing all aspects relating to biodiversity.** The institutional framework for CBD’s implementation is provided by the Conference of the Parties (COP). **The COP is the governing body of CBD which keeps under review implementation of the Convention, and steers its development COP is the supreme decision making body which has the authority to adopt protocols under the Convention. It also has the authority to amend the Convention itself. Hence, statement 2 is not correct.**

95. Why Hope Island in Andhra Pradesh has become graveyard for Olive Ridleys turtles?

- (a) Olive Ridleys are poached illegally near Hope Island
- (b) Most of Olive Ridleys are crushed under the mechanised boats and succumb to injuries
- (c) Creation of dams and irrigation projects are proved graveyard for Olive Ridleys
- (d) Oil spill and lack of food is the major threat on Olive Ridleys in this region

Answer: (B)

Explanation: Olive Ridley turtle is the smallest and most abundant of all sea turtle found in the world.

It gets its name from its olive coloured carapace, which is heart-shaped and rounded. **It is found in warm waters of the Pacific and Indian oceans.** It spends entire lives in the ocean and migrates thousands of kilometers between feeding and mating grounds in the course of a year. Though found in abundance, their numbers have been declining over the past few years. It is **recognized as Vulnerable by the IUCN Red list. In India, it is protected under the Wildlife (Protection) Act.**

- **Carcasses of Olive Ridley turtles are washing ashore on Hope Island’s beaches here, indicating that the breeding cycle of the endangered species has been dealt a severe blow this year by mechanised fishing boats.**
- As these fishing boats scour the Bay of Bengal coastline, there is gloom among conservationists and forest department officials that this year will be bad for the turtles.
- **The turtles, which are protected under the Wildlife (Protection) Act, commence their journey from the Indian Ocean during their mating season in October and November.** When they reach the Bay of Bengal, the females lay eggs on the beaches. Even as the destination for a majority is Gahirmatha in Odisha, the sandy stretches of Hope Island of the Coringa Wildlife Sanctuary have turned into a breeding area for a few hundred turtles every year.
- Owners of mechanised boats are not taking precautions to protect the turtles. Most of them are crushed under the boats and succumb to injuries.

96. Consider the following statements regarding Subsidiary Alliance System:

1. The native ruler had to keep an English army for the security of his kingdom, the expenses of which were borne by the company.
2. A British Resident had to be kept in the native states.
3. The native states became completely dependent on the Company for their security.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (B)

Explanation: Treaty System was a treaty between the British East India Company and the Indian princely states. It was built by Lord Wellesley between the years 1798 and 1805. Under this treaty, Indian rulers were made subordinate to the wishes of the British East India Company. **The Indian states that signed**

the Subsidiary Treaty lost their sovereignty to the British. Terms of Subsidiary Treaty:

- They were not expected to engage in wars or enter into treaties.
- Subsidies must be paid to maintain one's crew.
- The Resident was kept in the court of the native ruler.
- Under the Subsidiary Treaty System, if an Indian ruler entered into a subsidiary treaty with the British, he would have to accept the presence of a British army in his territory and would also have to bear the expenses of the British army.

Hence, statement 1 is incorrect while statements 2 and 3 are correct.

97. Consider the following statements related to the reasons for the decline of handicrafts in India:

1. Decline of native princely states
2. Excessive taxes on Indian goods in England
3. Beginning of free trade with the Charter of 1813

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: Reasons for decline of handicrafts in India:

- The decline of the native princely states which were the biggest buyers of these industries.
- In England, excessive taxes were imposed on Indian goods, due to which the goods here were available at expensive rates.
- The introduction of free trade by the Charter of 1813 led to the large-scale arrival of British traders in India, who came not to buy goods made in India but to sell goods made in England. Therefore, the above mentioned three reasons contributed to the decline of handicrafts in India.

98. Who among the following was /were an economic critic of colonialism in India?

1. Dadabhai Naoroji
2. G. Subramanya Iyer
3. R. C. Dutta

Select the correct answer using the code given below.

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (D)

Explanation: Between 1870 and 1905, many Indian intellectuals analyzed the economic aspects of British

rule. Among these, the contribution of three people was most important. **They were: 1. Dadabhai Naoroji 2. Mahadev Govind Ranade and 3. I. C. S officer Ramesh Chandra Dutta.** They wrote the economic history of India. Apart from these three, other political activists and journalists including G.V. Joshi, G. Subramanya Iyer, Gopalkrishna Gokhale, Prithvish Chandra Roy analyzed every aspect of the then economy in depth. **These people came to the conclusion that the biggest obstacle in the way of India's economic development was colonialism.**

99. Consider the following pairs:

1. Strachey Commission	Lord Lytton
2. Lyell Commission	Elgin
3. Macdonald Commission	Curzon
4. First Industrial Commission	Chelmsford

How many of the above pairs are not correctly matched?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Strachey Commission was formed by Lord Lytton to give suggestions related to famine. Whereas Lyell Commission was formed by Lord Elgin to give suggestions related to famine whereas Macdonald Commission was constituted by Lord Curzon. **The first Industrial Commission was constituted by Lord Hardinge II in 1921 AD. Hence, pairs 1, 2, and 3 are correctly matched, while pair 4 is not correctly matched.**

100. Who among the following laid the foundation of English education in India?

1. Charter Act of 1813
2. General Committee of Public Instruction, 1823
3. Orientalist and Anglicist controversy

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (D)

Explanation: The East India Company discouraged the prevalent system of Oriental education and promoted Western education and the English language. **In the Charter Act of 1813, a provision for spending one lakh rupees annually for the spread of**

education in India was adopted. In 1823, the General Committee of Public Instruction was formed, whose responsibility was to give a grant of one lakh rupees for education. The committee included 10 European members, after which, during the reign of Governor General Lord William Cavendish Bentinck (1828-1835), on March 7, 1835, Lord Macaulay's proposal was accepted and English was accepted as the medium of higher education in India. The **supporters of Anglicist education in India were led by Munro and Elphinstone, while H. T. Prinsep was the leader of the supporters of Orientalist education.**

101. With reference to the Indian Constitution, consider the following statements:

1. Secularism, socialism and fraternity were added to the Preamble through the 42nd Amendment Act.
2. Liberty, equality and fraternity are taken from the Constitution of Ireland.
3. Constitution Day was celebrated for the first time on 26 November 2014.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (D)

Explanation: Secularism, socialism and integrity were added to the Preamble of the Constitution of India through the 42nd Constitutional Amendment Act, 1976. Hence, statement 1 is not correct. The ideals of liberty, equality and fraternity in the Preamble are taken from the French Revolution (1789–1799). Hence, statement 2 is not correct. The Government of India decided on 19 November 2015 to celebrate 26 November as Constitution Day. Constitution Day was celebrated for the first time on 26 November 2015. Since then Constitution Day is celebrated every year on 26 November. Hence statement 3 is not correct.

102. Consider the following pairs:

1. Sikkim	1962
2. Jharkhand	2000
3. Nagaland	1975
4. Telangana	2014

How many of the above pairs are correctly matched with year of formation?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (B)

Explanation: Sikkim was formed on May 16, 1975.

On this day Sikkim became the 22nd state of the Republic of India. Jharkhand was formed on November 15, 2000. Jharkhand was created by the Bihar Reorganization Act. The birth anniversary of great Lord Birsa Munda is also celebrated on 15th November.

Nagaland was formed on December 1, 1963. Indian President Sarvepalli Radhakrishnan inaugurated the state of Nagaland in Kohima. Telangana was formed on June 2, 2014.

103. Consider the following statements, with reference to Quo- Warranto:

1. It is issued by the court to enquire into the legality of claim of a person to a public office.
2. It can be sought by any interested person and not necessarily by the aggrieved person.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: In the literal sense, Quo- Warranto means 'by what authority or warrant'. It is issued by the court to enquire into the legality of claim of a person to a public office. Hence, it prevents illegal usurpation of public office by a person. Hence, statement 1 is correct. The writ can be issued only in case of a substantive public office of a permanent character created by a statute or by the Constitution. It cannot be issued in cases of ministerial office or private office. Unlike the other four writs, this can be sought by any interested person and not necessarily by the aggrieved person. Hence, statement 2 is correct.

104. Consider the following pairs:

1. B.R. Ambedkar	Chairman of the Drafting Committee
2. Motilal Nehru	President of the Constituent Assembly
3. Rajendra Prasad	Member of the Constituent Assembly

How many of the above pairs are correctly matched?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (A)

Explanation: B.R. Ambedkar served as the Chairman of the Drafting Committee during the framing of the Indian Constitution. The committee had seven members. He was Social revolutionary thinker and agitator against caste divisions and caste based inequalities. Hence, pair 1 is correctly matched. Dr. Rajendra Prasad was the President of the Constituent Assembly of India. The Constituent Assembly was formed to draft and adopt a constitution, and held its first meeting on December 9, 1946. He was Lawyer, known for his role in the Champaran Satyagraha. He became the first President of India. Hence, pair 2 is not correctly matched. The Constituent Assembly of India had 389 members, including 292 representatives of provinces, 93 representatives of princely states, and four representatives of the chief commissioner provinces. Motilal Nehru was an important leader of the Indian National Congress. Along with other congress leaders, he prepared a Constitution for India in 1928. Hence, pair 3 is not correctly matched.

105. Who said 'Preamble' is the identity card of the Constitution?

- (a) K. M. Munshi
- (b) N. A. Palkhiwala
- (c) M. Hidayatullah
- (d) Sir Ernest Barker

Answer: (B)

Explanation: The Preamble embodies the basic philosophy and fundamental values-political, moral and religious on which the constitution is based. It contains the grand and noble vision of the Constitution Assembly and reflects the dreams and aspirations of the founding fathers of the Constitution.

According to K. M. Munsu (member of the Drafting Committee), the preamble is the 'horoscope of our sovereign democratic republic'. N.A. Palkhivala, an eminent jurist and constitutional expert, called the preamble as the identity card of the constitution'. M. Hidayatullah, a former chief Justice of India, said that Preamble is the soul of our constitution. Sir Ernest Barker, a distinguished English political scientist, described the preamble as the key-note to the constitution. Another member of the constituent assembly, Pandit Thakur Das Bhargava said that the Preamble is the soul of the constitution.

106. Regarding Samudragupta, consider the following statements:

- 1. Samudragupta believed in a policy of peace and non-aggression.
- 2. The Allahabad Pillar inscription was composed by Amarsimha.

- 3. During Samudragupta's reign, Meghavarman sent a missionary to build a Buddhist temple Gaya.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer:- A

The Gupta kingdom was enlarged enormously during the reign of Samudragupta (AD 335- 380).

- Samudragupta was the opposite of Ashoka. Ashoka believed in the policy of peace and non- aggression but Samudragupta delighted in violence and conquest. Hence, statement 1 is not correct.
- The court poet Harishena wrote the glowing account of Samudragupta's military exploits in the Allahabad Pillar inscription. Hence, statement 2 is not correct.
- According to a Chinese source, Meghavarman, the ruler of Srilanka sent a missionary to Samudragupta for permission to build a Buddhist temple at Gaya. Hence, statement 3 is correct.

107. Consider the following scholars:

- 1. Amarsimha
- 2. Varahmihir
- 3. Kalidasa

How many of the above was/were adorned as nine gems of Chandragupta II?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: C

The term "Navaratna" refers to a group of nine exceptional scholars and advisors who were part of Chandragupta II's court. These nine individuals were renowned for their expertise in various fields, including literature, astronomy, mathematics, medicine, and the arts.

A brief description of the nine Ratnas is as follows:

- Amarsimha: Amarsimha was a Sanskrit lexicographer and a poet and his Amarkosha is a vocabulary of Sanskrit roots, homonyms, and synonyms. Hence, option 1 is correct.
- Dhanvantri: He was a great Physician.
- Harisena: He is known to have composed the Prayag Prasasti or Allahabad Pillar Inscription.
- Kahapanaka :Kahapanaka was an astrologer.
- Sanku: Sanku was in the field of Architecture.
- Varahamihira: Varahamihira lived in Ujjain and he wrote three important books: Panchasiddhantika, Brihat Samhita, and Brihat Jataka. Hence, option 2 is correct.

- **Kalidasa:** A renowned **Sanskrit poet and playwright**, considered one of the greatest literary figures in ancient India. **Hence, option 3 is correct.**
- **Vararuchi:** Vararuchi is the name of another gem of Chandragupta Vikramaditya who was a grammarian and Sanskrit scholar.
- **Vetalbhata:** Vetalbhata was a magician.

108. Consider the following pairs:

Inscriptions	Rulers
1. Mehrauli Iron pillar	(a) 1 and 2 only Buddhagupta
2. Junagrah Rock Inscription	(b) 2 and 3 only Chandragupta II
3. Paharpur Copper Plate	(c) 1 and 3 only (d) 1, 2 and 3 Samudragupta

How many of the above pairs are correctly matched?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: D

- **Mehrauli Iron pillar:** The iron pillar of Delhi is a structure 7.21 meters (23 feet 8 inches) high with a 41-centimeter (16 in) diameter that was constructed by **Chandragupta II** (reigned c. 375–415 CE), and now stands in the Qutb complex at **Mehrauli in Delhi, India. Hence, pair 1 is not correctly matched.**
- **Junagrah Rock Inscription:** The Junagadh rock inscription of Rudradaman, also known as the Girnar Rock inscription of Rudradaman, is a Sanskrit prose inscribed on a rock by the Western Satraps ruler Rudradaman I. It is located near Girnar Hill near Junagadh, Gujarat, India. The inscription is dated to shortly after 150 CE. The Junagadh rock contains inscriptions of Ashoka (one of fourteen of the Major Rock Edicts of Ashoka), Rudradaman I, and **Skandagupta. Hence, pair 2 is not correctly matched.**
- **Paharpur Copper Plate inscription:** The Paharpur Copper Plate inscription is a historical artifact discovered in the ruins of the Buddhist monastery at Paharpur, Bangladesh. The inscription is written in the Brahmi script and records the donation of land to the monastery by a local ruler named **Buddha Gupta**. The inscription provides important information about the political and religious history of the region during this time period. **Hence, pair 3 is not correctly matched.**
- **Prayag Prashasti:** It is attributed to the 4th century CE Gupta emperor **Samudragupta**, and follows immediately below the edicts of Ashoka. It is considered "the most important historical document of the classical Gupta age".

109. Regarding the coinage system during the Gupta age, consider the following statements:

1. Guptas issued the largest number of gold coins in ancient India.
2. During the Gupta Period, gold coins were called Pana.
3. Gupta coins were more pure than the Kushans.

Which of the statements given above is/are not correct?

Answer: B

Gupta coinage (4th-6th centuries AD) followed the tradition of the Kushans, depicting the king on the obverse and a deity on the reverse; the deities were Indian and the legends were in Brahmi.

- In ancient India, the Guptas issued the largest number of gold coins. **Hence, statement 1 is correct.**
- During the Gupta Period, gold coins were called **Dinaras. Hence, statement 2 is not correct.**
- Gupta coins were not as pure as the Kushan ones in terms of gold content. **Hence, statement 3 is not correct.**

110. Consider the following pairs:

Books	Authors
1. Swapanwasvadattam	Bhasa
2. Malvikagnamitram	Shudrak
3. Harshcharita	Banabhatta

How many of the above pairs are correctly matched?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: B

- **Svapnavasavadattam** is a Sanskrit play in six acts written by the ancient Indian poet **Bhasa**. The plot of the drama is drawn from the romantic narratives about the Kaushambi king **Udayana** and **Vasavadatta**, the daughter of Pradyota, the ruler of Avanti, which were current in the poet's time and which seem to have captivated popular imagination. **Hence, pair 1 is correctly matched.**
- The **Malvaikagnimitram** is a Sanskrit play by **Kalidasa**. Based on some events of the reign of **Pushyamitra Shunga**, it tells the story of the love of Agnimitra, the Shunga Emperor at Vidisha, for the beautiful handmaiden of his chief queen. **Hence, pair 2 is not correctly matched.**

- **The Harshacharita** is the biography of the Indian emperor **Harsha** by **Banabhatta**, also known as Bana, who was a Sanskrit writer of seventh-century CE India. **Hence, pair 3 is correctly matched.**

111. With reference to stem cell therapy, consider the following statements:

1. It is a type of treatment that uses the patient's own stem cells to repair damaged tissue and injuries.
2. Stem cells are usually taken from bone marrow or fat tissue in the upper thigh or abdomen.
3. Bone marrow transplant is used in leukemia, tuberculosis and sickle cell anemia.

How many of the above statements are not correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (A)

Explanation: Stem cell therapy uses the patient's own stem cells to repair damaged tissues and injuries. It is used to treat many disorders including neuromuscular and degenerative disorders. **Stem cells are usually taken from the bone marrow or fat tissue in their upper thighs or abdomen.** Since it is common to remove stem cells from areas of stored body fat, some **people refer to stem cell therapy as 'adipose stem cell therapy'.** **Hence statements 1 and 2 are correct.** Bone marrow transplantation is used in leukemia cell anemia and other immunodeficiency disorders and not tuberculosis. **Hence statement 3 is not correct.**

112. Consider the following:

1. Restriction Enzymes
2. Polymerase Enzyme
3. Ligase
4. Vector
5. Host

How many of the above are means of recombinant DNA technology?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

Answer: (D)

Explanation: The instruments required for recombinant DNA technology are:

- **Restriction enzymes:** These enzymes cut DNA molecules at specific locations.
- **Polymerase enzymes:** These enzymes replicate DNA molecules.

- **Ligases:** These enzymes join DNA molecules together.
- **Transporters:** These are DNA molecules that can transfer DNA from one organism to another.
- **Host:** These are the organisms into which the vector DNA is inserted.

113. India has retained its status as a non-member of the 'Budapest Convention'. It related to which of the following?

- (a) Cyber crime
- (b) Outer space
- (c) Bio-remediation
- (d) Global warming

Answer: (A)

Explanation: The **Convention on Cyber Crime, also known as the Budapest Convention, is the first international treaty addressing Internet and computer crimes.** Under the Budapest Convention, cyber crimes are considered extraditable offences. The Budapest Convention on Cybercrime is a treaty of the Council of **Europe. It came into force in 2001 and entered into force on July 1, 2004,** and on November 23, 2001, Canada, Japan, the United States, and South Africa signed this convention. **India is a non-member of the Budapest Convention on Cyber Crime.** India believes that sharing data with foreign law enforcement agencies is a violation of national sovereignty.

114. Consider the following pairs:

(Missile)	(Projection)
1. Agni	Surface to surface
2. Trishul	Surface to air
3. Nag	Surface to surface

How many of the above pairs are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) All three pairs
- (d) None of the pairs

Answer: (B)

Explanation: Agni: It is a family of surface-to-surface medium to intercontinental range ballistic missiles. It is possible to control them due to the Global Positioning System (GPS) present in them. **Agni-1 to 5 missiles have been designed and developed by Defense Research and Development Organization (DRDO). Range of Agni Missile:**

- The range of Agni-1 is 700 km.
- The range of Agni-2 is 2000 km.
- The range of Agni-3 is 3000 km.
- The range of Agni-4 is 4000 km.

- The range of Agni-5 is 5000 km.

Trishul- Trishul, the first indigenous surface-to-air missile developed by the Defense Research and Development Organisation, is a short-range missile. It can be used by all three- **Air Force, Army and Navy.**
Nag Nag missile is a third generation anti-tank guided missile (ATGM). It has been **developed by Defense Research and Development Organization (DRDO).**

115. Consider the following statements regarding Goldilocks Zone:

1. It depends on the radiation produced by the concerned star.
2. The Earth revolves in the Goldilocks zone of the Sun.

Which of the above statements is/are correct?

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (C)

Explanation: The **Goldilocks Zone** is the area around a star where a planet like Earth can contain liquid water on its surface and life is possible there. Thus, the size of the Goldilocks zone depends on the radiation generated by the respective star. Depending on the size and type of star, the distance to the Goldilocks Zone varies. **Hence statement 1 is correct.**

Earth's orbit is about 150 million kilometers from the Sun, which is within the Goldilocks Zone. At this distance, water exists in liquid form on Earth, which is essential for life. **Hence statement 2 is correct.**

116. Consider the following:

1. Flies
2. Cockroach
3. Crabs
4. Jellyfish

Which of the above mentioned organisms are called detritivores?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (C)

Explanation: An **herbivore eats detritus, which includes organic waste, debris and dried animal feces.** Examples of detritivores are flies, cockroaches, crabs, earthworms, termites and wood ants. **Both decomposers and detritivores help in the disintegration or decomposition of dead and decaying matter.** Both obtain their energy from

waste materials. Without their contribution the earth would be filled with dead matter and dead bodies.

Hence, option (c) is correct.

117. Consider the following statements:

Statement-I: India has signed the Kyoto Protocol, but is exempted from its obligations.

Statement-II: India believes that developed countries should take greater responsibility for reducing greenhouse gas emissions.

Which of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement –II is the correct explanation of Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Answer: (A)

Explanation: **India signed and ratified the Kyoto Protocol (1997) in 2002.** India, China and other developing countries have been exempted from the obligations of the Kyoto Protocol because they did not contribute much in terms of greenhouse gas emissions during the industrialization period. **Hence, Statement-I is correct.** A meeting of Group-8 countries was held in June 2005. In this, **India pointed out that the per capita emission rates of greenhouse gases in developing countries are nominal compared to developed countries.** In line with the principle of common but differentiated responsibilities, India is of the view that developed countries have the greatest responsibility for reducing emissions because these countries have emitted so much over a long period of time. **Hence, Statement-II is correct.** Statement II is the correct explanation of Statement I because it explains why India has signed the Kyoto Protocol and why India has been exempted from its obligations.

118. Consider the following statements regarding life forms in aquatic ecosystem:

1. Benthos, organisms are those which live in the bottom of water.
2. Nekton are organisms that remain attached to the stems and leaves of rooted plants.
3. Neuston are non-attached organisms that live at the interface of air and water.

How many of the above statements are correct?

- (a) Only one
- (b) Only two

- (c) All three
- (d) None

Answer: (B)

Explanation:

Benthos: Benthic organisms are those that live at the bottom of the water. Well-developed benthos are found in practically every aquatic ecosystem. **Hence statement 1 is correct.**

Nekton: It is a group of water or sea creatures that travel together independently. These organisms can be fish, crustaceans or mollusks that live in the sea or lake. **Hence statement 2 is not correct.**

Neuston: These are non-attached organisms that live at the interface of air and water, such as floating plants etc. **Hence statement 3 is correct.**

119. Consider the following statements:

1. The era of industrialization is considered responsible for the current global warming.
2. India ratified the Paris Climate Agreement on 2 October 2017.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (A)

Explanation: Greenhouse gas emissions increased significantly during the Industrial Revolution due to the burning of fossil fuels, deforestation, and other human activities. Greenhouse gases trap heat in the atmosphere, causing Earth's temperature to rise.

Hence, statement 1 is correct. The Paris Agreement (2015) is a landmark agreement that calls on countries to tackle climate change and limit global temperature rise to below 2 degrees Celsius. India **ratified the Paris Agreement on October 2, 2016.** Hence, **statement 2 is not correct.**

120. Which of the following ecosystems will sequester the most carbon for a given unit of area?

- (a) Saline land
- (b) Grassland
- (c) Bare Soil
- (d) Mature tropical forest

Answer:

(A)

Explanation: Saline wetlands are one of the key coastal 'blue carbon' habitats, recognized for their ability to store carbon within above- and below-ground biomass and sediments. Saline lands sequester two to four times more carbon than tropical forests. **Hence, option (a) is correct.**



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