CURRENT AFFAIRS MAGAZINE
OCTOBER, 2023

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India's Best Mentorship for Civil Services

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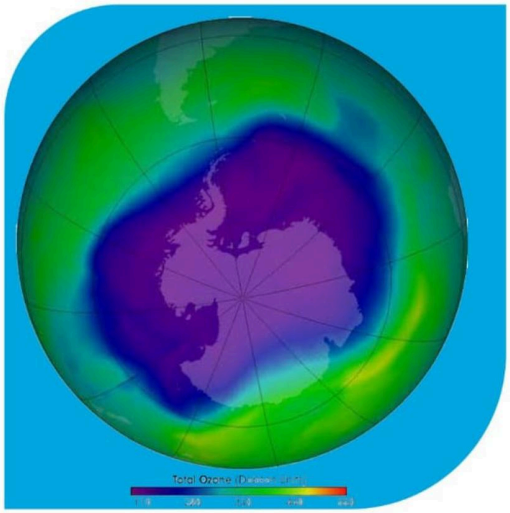

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Mains Daily News Analysis

GS Paper – 1

1. Mahatma Gandhi's 154th Birth Anniversary

Why in News?

On **2nd October, 2023**, **Mahatma Gandhi's** **154th birth anniversary** was celebrated across the nation to commemorate his principles and ideals that inspired the nation until the present times, owing to the indispensable role played by him during the freedom struggle.

- His contributions to the freedom struggle earned him the epithet of **"Father of Nation"** which led to his portrait being featured on Indian legal banknotes.
- Being a multi-faceted personality, Mahatma Gandhi had a **deep interest in music,** and he always **promoted safeguarding the environment.**

How did Mahatma Gandhi Become a Permanent Feature on Legal Banknotes of India?

- **The Origins of Gandhi's Image on Indian Currency:**
  - The portrait of Gandhi visible on banknotes is a cut-out of a photograph taken in 1946, where he is standing with **British politician Lord Frederick William Pethick-Lawrence.**
  - The photograph was selected as it had the most suitable expression of Gandhi smiling — the portrait is a mirror image of the cut-out.
  - According to **Section 25 of the RBI Act, 1934,** "the design, form and material of banknotes" shall be such as may be approved by the central government after consideration of the recommendations made by the central board.
- **Gandhi's First Appearance on INR notes:**
  - Gandhi first featured on Indian currency in **1969,** when a special series was issued to commemorate his **100th birth anniversary.**
  - Then, in October **1987,** a series of ₹ **500 currency notes**, featuring Gandhi, was launched.
- **Gandhiji, a Permanent Feature on Banknotes:**
  - Gandhi was chosen because of his national appeal, **and in 1996**, a new 'Mahatma Gandhi Series' was launched by the RBI to replace the **former Ashoka Pillar bank notes.**
  - Several security features were also introduced, including a windowed security thread, latent image and intaglio features for the visually impaired.

What are Mahatma Gandhi's Lessons on Sustainability?

- **Simplicity and Minimalism:**
  - Gandhi advocated for a **simple and minimalist lifestyle**. He believed that individuals should live with the bare minimum and avoid excessive consumption.
  - This idea of simple living, or **"Sarvodaya,"** promotes the conservation of resources and a reduced ecological footprint.
- **Self-Sufficiency:**
  - Gandhi emphasized the importance of self-sufficiency at the community level. He promoted the idea of **villages being self-reliant** in terms of food, clothing, and other basic needs.
  - This approach reduces dependence on external resources and **minimizes environmental impacts** associated with long-distance transportation and trade.
- **Nonviolence (Ahimsa):**
  - Gandhi's principle of non-violence extends beyond human relations to encompass all living beings and the environment. He believed in the **ethical treatment of animals and was a vegetarian himself.**
  - This reflects his concern for the well-being of all creatures and the importance of coexisting harmoniously with nature.
- **Sustainable Agriculture:**

- Gandhi supported sustainable and **organic farming practices.** He advocated for the use of natural fertilizers, crop rotation, and traditional farming methods that preserve soil fertility and reduce the need for chemical inputs.

- **Conservation of Resources:**
  - Gandhi emphasized the **responsible use and conservation of natural resources,** such as water and forests.
  - He believed in protecting and regenerating the environment to ensure that future generations have access to these resources.
- **Localism and Decentralization:**
  - Gandhi was a proponent of the **decentralization of power and resources.** He believed in devolving authority to local communities, which can be more attuned to their own environmental and sustainability needs.
- **Swadeshi:**
  - Gandhi promoted the **Swadeshi movement,** which encouraged the use of locally produced goods and materials.
  - This concept aimed to reduce the ecological impact of long-distance trade and promote local economies.
- **Respect for Nature:**
  - Gandhi believed that humans should have a **deep respect and reverence for nature**.
  - He saw nature as an essential part of human life and called for responsible stewardship of the environment.
- **Vasudhaiva Kutumbakam:**
  - His belief in **Vasudev Kutumbakam** (the entire world is one family) encourages us to believe that we all are citizens of one world and that we must remain conscious of global issues.

What is the Relationship of Mahatma Gandhi's Idea of Politics with Music?

- **Bhajans and Religious Music:**
  - Gandhi had a strong spiritual side, and he often used devotional music, such as **bhajans (Hindu religious songs),** as a means of connecting with his inner self and finding solace.
  - He believed that **singing hymns and religious songs helped purify the mind** and strengthen one's connection with the divine.
- **Inspirational Songs:**
  - Gandhi encouraged the use of inspirational songs and patriotic songs to unite people in the struggle for independence.
  - Songs like **"Raghupati Raghava Raja Ram"** and **"Vaishnav Jan To"** were among his favourites and were frequently sung during his prayer meetings and public gatherings.
- **Fasting and Silence:**
  - Gandhi sometimes observed **periods of fasting and silence** as a form of protest or self-purification.
  - During these times, he often communicated with others **through written messages and used music to convey his thoughts and feelings.**
- **Community Bonding:**
  - Music played a **crucial role in bringing communities together** during Gandhi's nonviolent movements.
  - Chants, songs, and music **created a sense of unity and solidarity** among the participants in various campaigns, such as the **Salt March.**
- **Promotion of Folk Music:**
  - Gandhi was a proponent of traditional Indian culture and believed in the preservation of folk music and arts.
  - He encouraged the **use of local languages and music to connect with the masses,** as he believed that they were more relatable and accessible.
- **Role in Nonviolent Resistance:**
  - Music was an integral part of the **nonviolent resistance movements** led by Gandhi. It served as a means of inspiring and mobilizing people, **fostering a sense of collective identity, and uplifting spirits** during challenging times.
- **Advocacy for Simplicity:**
  - Gandhi's philosophy of simplicity and minimalism extended to music. He preferred **simple and melodious tunes that could be easily understood and appreciated by the common people.**

2. Caste-Census in Bihar

Why in News?

Recently, the Government of the State of Bihar released findings of the **Caste Survey, 2023** which revealed that **Other Backward Classes (OBCs)** and **Extremely Backward Classes (EBCs)** together **constitute 63 %** of the state's total population.

- The findings are supposed to have wider connotations in the State and National Elections and also in the identification of intended beneficiaries for various welfare schemes.

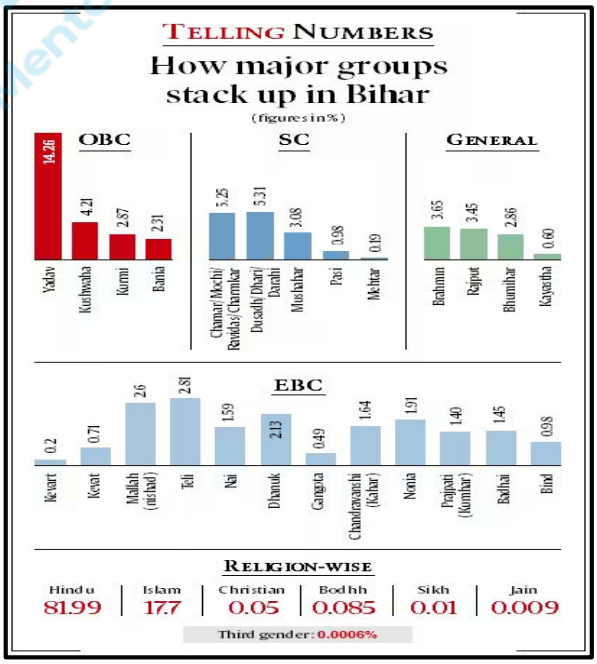
What are the Key Findings of the Bihar Caste Survey?

Different Castes and Communities (Bihar)	Percentage Population (%)
Extremely Backward Classes (EBCs)	36.01 %
Other Backward Classes (OBCs)	27.12 %
Scheduled Castes	19.65 %
Scheduled Tribes	1.68%
Buddhists, Christians, Sikhs and Jains	< 1 %
Total Population (Bihar)	13.07 crores

What was the procedure adopted in the Caste Survey?

The survey was carried out in **two phases,** which each had its **own criteria and objectives.**

- **First Phase:**
  - During this phase, the **number of all households** in Bihar was counted and recorded.
  - Enumerators were given a **set of 17 questions** which were to be mandatorily answered by the respondent.
- **Second Phase:**
  - During this phase data on people living in the **households, their castes, sub-castes, and socio-economic conditions** were collected.
  - However, filling in **the Aadhaar** number, caste certificate number and ration card number of the head of the family, was optional.



What is the Significance of the Bihar Caste Survey Findings?

- **Increasing the OBC Quota:**
  - The survey results will amplify the clamour for increasing the **OBC quota beyond 27%,** and **for a quota within quota for the EBCs.**
  - The **Justice Rohini Commission**, which has been examining the question of **sub-categorisation of OBCs since 2017,** submitted its report and recommendations are not yet made public.
- **Redrawing of 50% Reservation Ceiling:**
  - The survey data will also reopen the debate over the **50%** ceiling on reservation imposed by the Supreme Court in its landmark ruling in **Indra Sawhney v Union of India (1992).**

- Depending upon the population of OBCs, **the demand for an increase in reservation quota in proportion to that of the population** can arise from different quarters of the caste groups.

- **Fulfilment of Constitutional Obligations:**
  - Caste Survey will help attain the objectives as enunciated in **Directive Principles of State Policies (DPSPs)** as mentioned in **Part IV** of the constitution.
  - This will majorly help achieve the socio-economic objectives as outlined by the Constitution drafters.
- **Realisation of Sarvodaya:**
  - Caste Census can be properly utilised to develop targeted measures so as to reduce rampant inequality across the State and promote equity and social justice in the long term.

What are the Issues with the Caste Census?

- **Repercussions of a Caste Census:**
  - Caste has an **emotive element** and thus there exist the **political and social repercussions of a caste census**.
  - There have been concerns that counting caste may help solidify or harden identities.
  - Due to these repercussions, nearly a decade after the **SECC**, a sizable amount of its data remains unreleased or released only in parts.
- **Caste is Context-specific:**
  - Caste has never been a proxy for class or deprivation in India; it constitutes a distinct kind of embedded discrimination that often transcends class.
  - **For example:**
    - People with Dalit last names are less likely to be called for job interviews even when their qualifications are better than that of an upper-caste candidate.
    - They are also less likely to be accepted as tenants by landlords.
    - Marriage to a well-educated, well-off Dalit man still sparks violent reprisals among the families of upper-caste women every day across the country.

When was the last Caste Census Conducted in India?

- **Caste Census of 1931:**
  - The last caste census was **conducted in 1931**, and data was made publicly available by the British Government of the day.
  - This caste census became the basis for the implementation of **Mandal Commission Reports** and subsequent reservation policies by the government for **Other Backward Classes.**
- **Census of 2011:**
  - The **Census of 2011 became the first time to collect Caste-based data after independence.**
  - However, the data related to caste were not made public due to fear of political favouritism and opportunism.

What is the Census?

- **Origin of Census:**
  - The origin of the Census in India **goes back to the colonial exercise of 1881.**
  - The census has evolved and been used by the government, policymakers, academics, and others to capture the Indian population, access resources, map social change, **delimitation exercise**, etc.
- **First Caste Census as SECC (Socio-Economic and Caste Census):**
  - SECC was **conducted for the first time in 1931.**
  - SECC is meant to canvass every Indian family, both in rural and urban India, and ask about their:
    - **Economic status,** so as to allow Central and State authorities to come up with a range of indicators of deprivation, permutations, and combinations of which could be used by each authority to define a poor or deprived person.
    - It is also meant to ask every person their **specific caste name** to allow the government to **re-evaluate which caste groups** were economically worse off and which were better off.
- **Difference Between Census & SECC:**
  - The Census provides a **portrait of the Indian population**, while the SECC is a tool to identify beneficiaries of state support.
  - Since the **Census falls under the Census Act of 1948**, all data are considered confidential, whereas according to the SECC website, "all the personal information given in the SECC is open for use by Government departments to grant and/or restrict benefits to households."

3. Glacial Lake Outburst Flood in Sikkim

Why in News?

Sikkim recently experienced a **Glacial Lake Outburst Flood (GLOF).** The **South Lhonak Lake, a glacial lake** located at an altitude of 17,000 feet in the state's northwest, experienced a **rupture as a result of continuous rainfall.**

- Consequently, water was discharged into the downstream regions, causing flooding in the **Teesta River** and impacting four districts of Sikkim: **Mangan, Gangtok, Pakyong, and Namchi**, as reported by the Sikkim State Disaster Management Authority (SSDMA).
- This flooding also caused the **Chungthang Hydro-Dam in Sikkim (on the Teesta River) to breach**, worsening the overall situation.

What is a Glacial Lake Outburst Flood?

- **About**:
  - A **GLOF (Glacial Lake Outburst Flood)** is a sudden and potentially catastrophic flood that occurs **when water stored behind a glacier or a moraine (a natural accumulation of ice, sand, pebbles, and debris) is released rapidly.**
    - These floods happen when glacial lakes formed by melting ice accumulate water behind weak moraine dams.
    - **Unlike sturdy earthen dams, these moraine dams can fail abruptly, releasing large volumes of water in minutes to days, leading to devastating downstream flooding.**
  - The **Himalayan terrain,** with its **steep mountains**, is particularly vulnerable to GLOFs.
    - **Climate change**, accompanied by **rising global temperatures,** has expedited the process of glacier melting in the **Sikkim Himalayas.**
    - The region now boasts more than 300 glacial lakes, with ten identified as susceptible to outburst floods.
  - GLOF can be triggered by several reasons, including **earthquakes, extremely heavy rains and ice avalanches.**

- **Impact:**
  - GLOFs can result in catastrophic **downstream flooding.** They have the potential to release millions of cubic meters of water in a short period of time.
    - Peak flows during GLOFs have been recorded as high as **15,000 cubic meters per second (as per National Disaster Management Authority).**

How Susceptible is South Lhonak Lake to GLOFs?

- The **South Lhonak lake** in northern Sikkim is situated about 5,200 meters above sea level.
  - Scientists have previously warned that the **lake had been expanding over years**, possibly from the melting of the ice at its head.
  - Notably, seismic activities, including a **2011 magnitude 6.9 earthquake,** escalated the GLOF risk in the area.
- In 2016, the **Sikkim State Disaster Management Authority** and other stakeholders launched a critical plan to drain excess water from South Lhonak Lake.
  - Visionary innovator **Sonam Wangchuk** led the effort, employing **High Density Polyethylene (HDPE) pipes** to siphon off water from the lake.
  - This initiative successfully reduced the lake's water volume by approximately 50%, mitigating the risk to some extent.
- However, the recent tragedy is believed to be caused by an **avalanche originating from the ice-capped feature surrounding the lake.**

What are the Other Recent GLOF Incidents in India?

- In **June 2013**, Uttrakhand received an **unusual amount of rainfall leading to the melting of the Chorabari glacier** and the eruption of the **Mandakini River.**

- In **August 2014,** a glacial lake outburst flood hit the village of Gya in Ladakh
- In February 2021, Chamoli district in Uttarakhand witnessed flash floods which are suspected to have been caused by GLOFs.

What Actions be Taken to Reduce the Risk of GLOFs?

- **Glacial Lake Monitoring:** Establishing a comprehensive monitoring system to track the growth and stability of glacial lakes in vulnerable regions.
  - Satellite imagery, remote sensing technology, and **field surveys through drones** can be used to **regularly assess changes in glacial lakes and their associated moraine dams.**
- **Early Warning Systems:** Early warning systems that can provide timely alerts to downstream communities in the **event of a GLOF.**
  - Also, there is a need to complement it with **flood protection measures,** such as **constructing protective barriers, levees, or diversion channels** to redirect floodwaters away from populated areas.
- **Public Awareness and Education:** There is a need to **raise public awareness about the risks of GLOFs and educate communities** living downstream about evacuation procedures and safety measures, as per NDMA's guidelines related to GLOF.
  - Conduct drills and training programs to ensure that residents know how to respond in case of a GLOF.
- **International Cooperation: India can collaborate with neighbouring countries in the Himalayan region**, as GLOFs can have trans-boundary impacts.
  - Sharing information and best practices for GLOF risk reduction and management with neighbouring countries can help to mitigate the risk.

4. Chhatrapati Shivaji Maharaj's Wagh Nakh

Why in News?

Maharashtra's Cultural Affairs Ministry has signed a memorandum of understanding (MoU) with the Victoria and Albert Museum in London to bring back **Chhatrapati Shivaji Maharaj's** legendary **"Wagh Nakh"** a formidable medieval weapon to the state.

- The MoU states that the antique weapon will be handed over to the Government of Maharashtra **on a loan basis for a period of three years**, during which it will be displayed in museums across the state.

What is the 'Wagh Nakh'?

- The 'wagh nakh,' literally translating to '**tiger claws**,' is a unique medieval dagger used across the **Indian subcontinent.**
  - This fearsome weapon featured **four or five curved blades** affixed to a glove or a bar, designed for **personal defence or stealth attacks.**
  - Its sharp blades were capable of slicing through skin and flesh with ease.
- **Chhatrapati Shivaji's Defense with the 'Wagh Nakh':**
  - Chhatrapati Shivaji faced **Afzal Khan, a Bijapur general assigned to stop Shivaji's strong campaigns in the Konkan**. Khan suggested a peaceful meeting, but Shivaji, anticipating danger, came prepared.
  - **He concealed a 'wagh nakh' and wore chainmail (armour made from small metal rings) under his attire**. When Khan attacked, Shivaji's 'wagh nakh' struck, resulting in Khan's death, ultimately securing Shivaji's victory.

What are the Key Points Related to Chhatrapati Shivaji Maharaj?

- **Birth:**
  - Born on 19th February 1630, at Shivneri Fort in Pune District, Maharashtra, he was the son of **Shahaji Bhonsle**, a Maratha general with jagirs in Pune and Supe under the Bijapur Sultanate, and **Jijabai,** a deeply religious woman who greatly influenced him.
- **Important Battles:**

Battle of Pratapgad, 1659	▪ Fought at the fort of Pratapgad near the town of **Satara, Maharashtra,** between the forces of **the Maratha king Chhatrapati Shivaji Maharaj and the Adilshahi general Afzal Khan.**
Battle of Pavan Khind, 1660	▪ Fought at a mountain pass in the vicinity of fort Vishalgad, near the city of Kolhapur, Maharashtra, between the **Maratha Sardar Baji Prabhu Deshpande and Siddi Masud of Adilshahi.**
Sacking of Surat, 1664	▪ Fought near the city of Surat, Gujarat, between **Chhatrapati Shivaji Maharaj and Inayat Khan,** a Mughal captain.
Battle of Purandar, 1665	▪ Fought between the Mughal Empire and the Maratha Empire.
Battle of Sinhagad, 1670	▪ Fought on the fort of **Sinhagad near the city of Pune, Maharashtra between Tanaji Malusare, a commander of Maratha ruler Shivaji Maharaj and Udaybhan Rathod**, fort-keeper under Jai Singh I who was a Mughal Army Chief.
Battle of Kalyan, 1682-83	▪ Bahadur Khan of the Mughal Empire defeated the **Maratha army and took over Kalyan.**
Battle of Sangamner, 1679	▪ Fought between the Mughal Empire and Maratha Empire. This was the **last battle in which the Maratha King Shivaji fought.**

- **Titles:**
  - He took on the titles of **Chhatrapati, Shakakarta, Kshatriya Kulavantas and Haindava Dharmodhhaarak.**
- **Administration under Shivaji:**
  - **Central Administration:**
    - He established a centralised administration with a **council of eight ministers (Ashtapradhan)** who were directly responsible to him and advised him on various matters of the state.
    - The **Peshwa,** also known as the **Mukhya Pradhan**, originally headed the advisory council of Raja Shivaji.
  - **Provincial administration:**
    - Shivaji divided his kingdom into **four provinces.** Each province was further divided into districts and villages. The village was the basic unit of administration and was governed by a Deshpande or Patel with the help of a village panchayat.
    - Like the centre, there was a committee or council of eight ministers with **Sar-i- 'Karkun'** or the '**prantpati'** (Head of the province).
  - **Revenue Administration:**
    - Shivaji abolished the **Jagirdari System** and replaced it with the **Ryotwari System**, and made changes in the position of hereditary revenue officials who were popularly known as **Deshmukhs, Deshpande, Patils, and Kulkarnis.**
    - Shivaji strictly supervised the Mirasdars who had hereditary rights in land.
    - The revenue system was patterned on the **Kathi system of Malik Amber** in which every piece of land was measured by **Rod or Kathi.**
    - **Chauth and Sardeshmukhi** were other sources of income.
    - Chauth amounted to 1/4th of the standard that was paid to Marathas as **a safeguard against Shivaji's forces raiding non-Maratha territories.**
    - Sardeshmukhi was an **additional levy of 10% demanded from areas outside of the kingdom**.
  - **Military Administration:**
    - Shivaji established an efficient army, **paying ordinary soldiers in cash** and high-ranking officials through jagir grants **(Saranjam).**
    - His military included **infantry (Mavali foot soldiers), cavalry (horse riders and equipment handlers),** and a navy.

- Key roles included the **Sar-i-Naubat (Senapati) in charge of the army, Qiladars overseeing forts, Nayaks leading infantry units, Havaldars heading groups of five Nayaks, and Jumladars overseeing five Nayaks.**

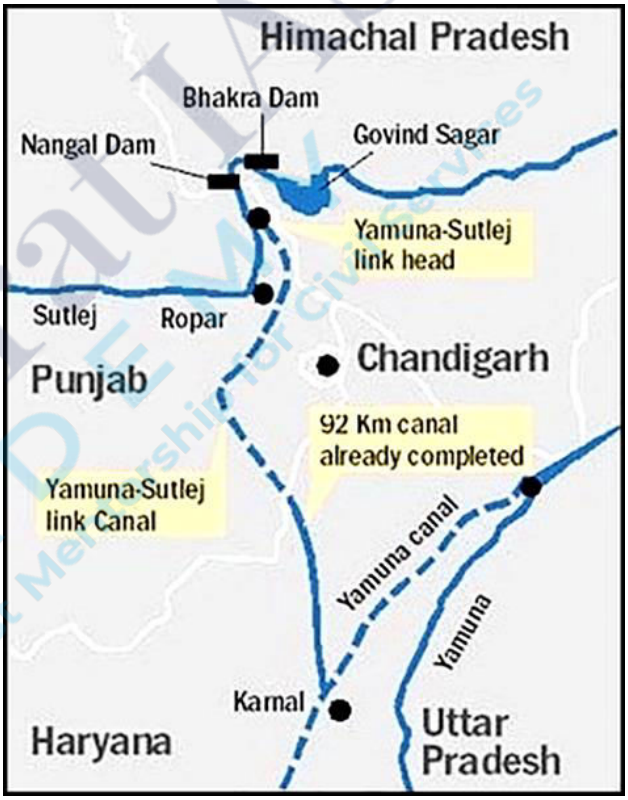
- **Death:**
  - Shivaji passed away in **Raigad in 1680** and was cremated at the **Raigad Fort.** Shivaji Maharaj Jayanti is celebrated each year on **19th February** to remember and praise his courage, warfare tactics and administrative skills.

5. Sutlej-Yamuna Link Canal Dispute

Why in News?

Recently, the Supreme Court has ordered the Punjab Government to complete the **Sutlej-Yamuna Link (SYL) canal**, warning the Government to comply with **its orders.**

- The court directed the Union Government to oversee **talks between the Punjab and the Haryana governments** on this topic; the Haryana government has completed construction of its half of the canal.
- The **Issue stems from a controversial 1981 water-sharing agreement drawn up when Haryana was carved out of Punjab in 1966.**



What is the Background?

- **1960:**
  - The dispute can be traced back to the **Indus Water Treaty** between India and Pakistan, allowing the former 'free and unrestricted use' of Ravi, Beas and Sutlej.
- **1966:**
  - The creation of Haryana from the **old (undivided) Punjab** presented the problem of giving Haryana its share of river waters.
  - For Haryana to get its share of the waters of the Sutlej and its tributary Beas, a canal linking the **Sutlej with the Yamuna was planned (SYL Canal).**
  - Punjab refused to share waters with Haryana stating it was against the riparian principle which dictates that the water of a river belongs only to the State and country or States and countries through which the river in question flows.
- **1981:**
  - Both states mutually **agreed on the reallocation of water.**
- **1982:**
  - Construction of the **214-km SYL was launched in Kapoori village,** Punjab.
  - Agitations, protests and assassinations were carried out in protest creating an environment of terrorism in the state and making the issue of national security.
- **1985:**
  - Prime Minister Rajiv Gandhi and **then Akali Dal chief Sant signed an accord agreeing for a new Tribunal** to assess the water.
  - The Eradi Tribunal headed by Supreme Court Judge V Balakrishna Eradi was set up to reassess the availability and sharing of water.
  - In 1987, the tribunal recommended an increase in the shares of Punjab and Haryana to 5 MAF and 3.83 MAF, respectively.
- **1996:**
  - Haryana moved the **Supreme Court (SC)** seeking directions to Punjab to complete the work on the SYL.
- **2002 and 2004:**
  - SC directed Punjab to complete the work in its territory.
- **2004:**
  - The Punjab Assembly passed the **Punjab Termination of Agreements Act**, terminating its water-sharing agreements and thus jeopardizing the construction of SYL in Punjab.

- **2016:**
  - SC started hearings into a **presidential reference (Article 143)** to decide on the legality of the 2004 Act and declared that Punjab backed out of its promise to share the waters of rivers. Thus, the **act was termed constitutionally invalid.**
- **2020:**
  - SC directed the **Chief Ministers of both states to negotiate and settle the SYL** canal issue at the highest political level to be mediated by the Centre.
  - Punjab has asked for a tribunal for a fresh time-bound assessment of the water availability.
    - Punjab holds that there has been no adjudication or scientific assessment of river waters in the state to date.
    - The **availability of Ravi-Beas water has also come down** from the estimated 17.17 MAF in 1981 to 13.38 MAF in 2013. **A fresh tribunal would ascertain all this**.

What is the Argument of Punjab and Haryana?

- **Punjab:**
  - Punjab vehemently **opposes sharing any additional water** with neighbouring states. They stress that Punjab lacks surplus water and highlight the reduction in their water allocation over the years.
  - Many areas in Punjab may **go dry after 2029** and the state has already **over-exploited its groundwater** for irrigation purposes as it fills granaries of the Centre by growing wheat and paddy worth ₹ 70,000 crore every year.
    - Water in about **79% of the state's area is over-exploited** and in such a situation, the government says sharing water with any other state is impossible.
- **Haryana:**
  - Haryana strongly advocates for the canal's completion, **citing a looming water crisis and asserting that Punjab** has been utilizing Haryana's share of water.
  - It says that providing irrigation is tough for the state and there was a problem of drinking water in **southern parts of Haryana,** where groundwater has depleted up to 1,700 feet.
  - Haryana has been **citing its contribution to the central food pool** and arguing that it is being **denied its rightful share in the water as assessed by a tribunal.**

What is the Significance of the Satluj Yamuna Link Canal?

- **Facilitating Equitable Water Sharing:**
  - The SYL Canal aims to **facilitate the equitable sharing of river waters** between Haryana and Punjab. Once completed, the **canal would enable the distribution of water from the Ravi and Beas rivers,** which are vital water sources in the region. This is crucial for both states to ensure fair access to water resources and prevent potential conflicts arising from unequal distribution.
- **Addressing Historical Water Disputes:**
  - It can address long-standing water disputes **between Haryana and Punjab.** By providing a defined pathway for water transfer, it aims to settle disagreements related to water allocation and usage, which **have persisted for decades and at times led to legal battles and political tensions.**
- **Enhancing Agricultural Productivity:**
  - The SYL Canal, by facilitating better water distribution, **can contribute to enhanced agricultural productivity** and sustainability.
  - It can support farmers in cultivating their lands effectively, leading to better yields and socio-economic development.
- **Socio-Economic Development:**
  - The SYL Canal can play a **significant role in promoting overall socio-economic development** in both states.
  - Reliable access to water is fundamental for industrial development, urbanization, and overall growth, benefiting various sectors and improving the quality of life for the residents.

What are the Reasons for Water Sharing Issues among Various States?

- Water-sharing issues among various states, **not only in India but in many parts of the world**, are complex and multifaceted, often involving several factors. Some common reasons that contribute to water-sharing issues among states:

- **Geographical Variation in Water Availability:** Different states have varying levels of access to water resources due to their geographical location, topography, and proximity to rivers, lakes, or other sources of water.
  - Some states may naturally have more abundant water resources, while others may face water scarcity.
- **Climate Change and Global Warming:** Climate change and global warming are altering weather patterns and affecting precipitation levels, leading to changes in **the availability and distribution of water.**
  - Erratic rainfall, prolonged droughts, and changing monsoon patterns can exacerbate water scarcity issues and create conflicts over water sharing.
- **Unequal Distribution of Rivers and Water Sources:** The distribution of rivers and other water sources across states is often unequal, causing disputes over access and utilization.
  - **States located upstream may have control over the source of a river,** while downstream states may face challenges in securing their fair share of water.
- **Construction of Dams and Reservoirs:** The construction of dams and reservoirs for various purposes can significantly alter the flow of rivers and affect water availability downstream.
- **Population Growth and Increased Demand:** Rapid population growth in certain states increases the demand for water for various purposes, including agriculture, industry, and domestic use.
  - This heightened **demand puts pressure on available water resources,** leading to conflicts over allocation and sharing.
- **Political and Inter-State Relations:** Political factors, interstate relations, and differing priorities among states can influence negotiations and agreements related to water sharing.
  - Political considerations, power dynamics, and electoral interests can complicate the resolution of water disputes.

What are the Sustainable Solutions for Water Sharing Issues?

- **Water Conservation and Efficiency Measures:**
  - Implementing **water-saving technologies** and promoting water conservation practices in agriculture, industry, and households can significantly reduce water demand.
- **Modernizing Irrigation Systems:**
  - Upgrading irrigation infrastructure to more **efficient systems like drip irrigation** can minimize water wastage in agriculture, a sector that consumes the majority of water resources.
- **Real-time Monitoring and Forecasting:**
  - Utilizing technology for **real-time monitoring of reservoir levels,** river flows, and weather patterns can aid in effective water management and timely decision-making, especially during climatic uncertainties.
- **Conflict Resolution Mechanisms:**
  - Establishing efficient conflict resolution mechanisms, **possibly outside the legal framework,** can help states resolve water-sharing disputes more expediently and collaboratively.
  - An atmosphere of cooperation and understanding among neighbouring states is necessary to address water disputes amicably.
- **River Basin Ecosystem Restoration:**
  - Focusing on restoring and preserving river basin ecosystems **can enhance the sustainability of water resources**. Healthy ecosystems contribute to the quality and availability of water.
  - Ensuring comprehensive **EIAs (Environmental Impact Assessment)** before initiating any water-related project can **prevent or mitigate adverse effects on water sources and ecosystems.**

Way Forward

- The water disputes can be **solved or balanced by having a permanent tribunal established** with appellate jurisdiction of the Supreme Court established over the tribunal's decision.
- The immediate target of any Constitutional Government should be an **amendment to Article 262** (Adjudication of disputes relating to waters of Inter-State Rivers or river valleys) and an amendment to the **Inter-State Water Disputes Act** and its implementation at the equal note.

6. Surge in Human Settlements in Flood-Prone Areas

Why in News?

According to a recent study conducted by the **World Bank**, **human settlements** in some of the **world's riskiest flood zones** have increased by a staggering **122% since 1985**, contributing to the vulnerability of millions to water disasters induced by **climate change.** And, this growth is **predominantly observed in middle- and low-income countries.**

- On the other hand, the most secure regions experienced an **80% increase in growth in human settlements.**

What are the Major Takeaways from the Study?

- **Global Landscape of Settlement Expansion:**
  - Most countries, **especially in East Asia,** saw more settlements in **regular flood zones and ultra-high flood zones** than in dry areas.
  - **Libya**, which suffered from devastating flooding in **September 2023,** had an 83% increase in settlement extent in the worst flood zones.
  - **Pakistan,** experiencing c**atastrophic flooding both in 2022 and 2023,** witnessed an 89% increase in settlements in prone areas.
- **Notable Exceptions:**
  - **Dry settlements in the United States increased by 76%**, while the highest flood settlements rose by only 46%.
  - Other countries with more dry settlements than ultra-wet areas include **India, France, Sweden, Austria, Finland, Japan and Canada.**

What are the Possible Factors behind Increasing Human Settlements in Flood Zones?

- **Rural to Urban Migration**: As countries experience economic growth, **urbanization near waterways becomes prevalent**. Settlements often expand into flood-prone areas as cities grow.
  - **For Example: Dar es Salaam, Tanzania,** exemplifies this issue, **growing from a fishing village to over seven million people.**
- **Economic Factor:** Low-income populations often **cannot afford to live in safer, less flood-prone areas.** They might be forced to live in flood-prone zones because of **housing affordability constraints.**
- **Lack of Regulatory Enforcement:** In some countries, **land-use planning** and zoning regulations might not be effectively enforced. This can result in **settlements proliferating in flood-prone areas without adequate safeguards.**
- **Cultural and Historical Ties:** Some communities have **deep cultural or historical connections to flood-prone regions**, and this can influence their decisions to remain or settle in these areas despite the risks.
- **Tourism and Recreation: Coastal and riverfront areas,** despite their vulnerability to flooding, continue to draw tourists and recreation enthusiasts because of their inherent appeal.
  - The **demand for resorts, hotels, and vacation homes** can lead to settlement in these areas, even if it's only seasonal.

Note

Settlement expansion into flood zones **does not negate the significance of climate change.** The two issues are **intertwined,** compounding risks and vulnerabilities. People might **prioritize immediate needs for shelter and livelihoods over long-term climate risks.**

- This can lead to decisions that are more focused on short-term survival.

Way Forward

- **Strict Land Use Policies:** Implement and enforce stringent land use regulations that **prohibit or restrict new construction in high-risk flood zones.**
  - Designate flood-prone areas as **'no-build' zones** and enforce these restrictions consistently.
- **Infrastructure Investment:** There is a need to invest in resilient infrastructure, including better **flood defences, early warning systems, and floodplain mapping.**
  - Improve drainage systems to mitigate the impact of flooding in existing settlements.

- **Government Support and Relocation Assistance:** The government can offer financial incentives for residents to relocate from flood-prone areas to safer zones.
  - Also, the government needs to strengthen **emergency response and preparedness measures in flood-prone areas** to minimize the loss of life and property during flood events.
- **Public Awareness and Education:** Launch public awareness campaigns to educate citizens about the **risks associated with living in flood-prone areas.**
  - Promote **community-based education programs on flood preparedness** and the importance of avoiding such areas.

7. Cabinet Approves Royalty Rates for Mining

Why in News?

Recently, the Union Cabinet has approved the amendment of the **2nd Schedule** of the **Mines and Minerals (Development and Regulation) Act, 1957 ('MMDR Act')** for specifying the rate of royalty in respect of 3 **Critical and Strategic minerals,** namely, **Lithium, Niobium and Rare Earth Elements (REEs).**

- This will enable the **Central Government** to auction blocks for **Lithium, Niobium and REEs** for the first time in the country.

Note

The **Mines and Minerals (Development and Regulation) Amendment Act, 2023** was passed by the Parliament and came into force in August, 2023.

- The Amendment delisted six minerals, including **Lithium and Niobium,** from the list of atomic minerals, thereby **allowing the grant of concessions for these minerals** to the private sector through auction.

What are Royalty Rates?

- **About:**
  - Mineral royalty is the **payment that the government (the sovereign owner) receives** for allowing the extraction of mineral resources.
  - A report by the **Centre for Social and Economic Progress (CSEP)** states that India has some of the highest mineral royalty rates in the world, which affects the competitiveness of its mining sector.
- **Key Amendments:**
  - The **2nd Schedule** of the **MMDR Act** provides royalty rates for various minerals. The amendment significantly lowers the royalty rates for these minerals.
  - For instance, Lithium mining will attract a **royalty of 3% based on the London Metal Exchange price.**
    - Niobium too, will be subject to a 3% royalty calculated on the ASP, in case of both primary and secondary sources.
    - REEs will have a royalty of 1% based on the ASP (Average Sale Price) of the Rare Earth Oxide (the ore in which the REE is most commonly found).
  - The Ministry of Mines has laid down the way to calculate the ASP of these minerals, on the basis of **which the bid parameters will be determined.**
  - Domestic mining is sought to be encouraged with the aim of lowering imports and setting up related end-use industries such as **Electric Vehicles (EVs)** and energy storage solutions.

What is the Significance of the Move?

- **Private Sector Participation:**
  - The amendment paves the way for the participation of the private sector through **auctioning concessions** for these minerals, as the government removed them from the **list of 'specified' atomic minerals.**
- **Global Benchmarking and Commercial Exploitation:**
  - By specifying new royalty rates aligned with global benchmarks, the **government is encouraging commercial exploitation** of these minerals through **competitive auctions,** either conducted by the central government or states.
- **Boosting Domestic Mining and Industries:**
  - The move aims to **encourage domestic mining to reduce imports** and promote the establishment of end-use industries like electric vehicles and energy storage solutions.
- **Commitment to Net-Zero Emissions:**

- The critical minerals targeted in this amendment are **viewed as essential for India's energy transition** and its commitment to achieving **Net-Zero Emissions** by 2070.

- **Strategic Push Against China:**
  - The effort to enter the **lithium value chain is part of India's strategic push** to reduce dependence on China, a major source of lithium-ion energy storage products.

What are the Key Points Related to Lithium, REEs, and Niobium?

- **Lithium:**
  - Lithium is a **vital ingredient for rechargeable lithium-ion batteries** used in electric vehicles, laptops, and mobile phones. India, currently reliant on imports for lithium, has made exploration efforts in regions like Jammu & Kashmir, Rajasthan, Gujarat, Odisha, and Chhattisgarh to extract lithium.
- **Rare Earth Elements (REEs):**
  - REEs are crucial for permanent magnet motors used in electric vehicles. They are primarily sourced from or processed in China, presenting a supply chain challenge.
  - REEs mining can have environmental implications, and India's efforts aim to secure a supply of **REEs while considering environmental sustainability.**
- **Niobium:**
  - Niobium is used to **enhance the strength of alloys**, making them particularly useful in various applications such as jet engines, buildings, oil and gas pipelines, magnets for MRI scanners, etc.
  - Nobium is a silvery metal that is **very resistant to corrosion** due to a layer of oxide on its surface.

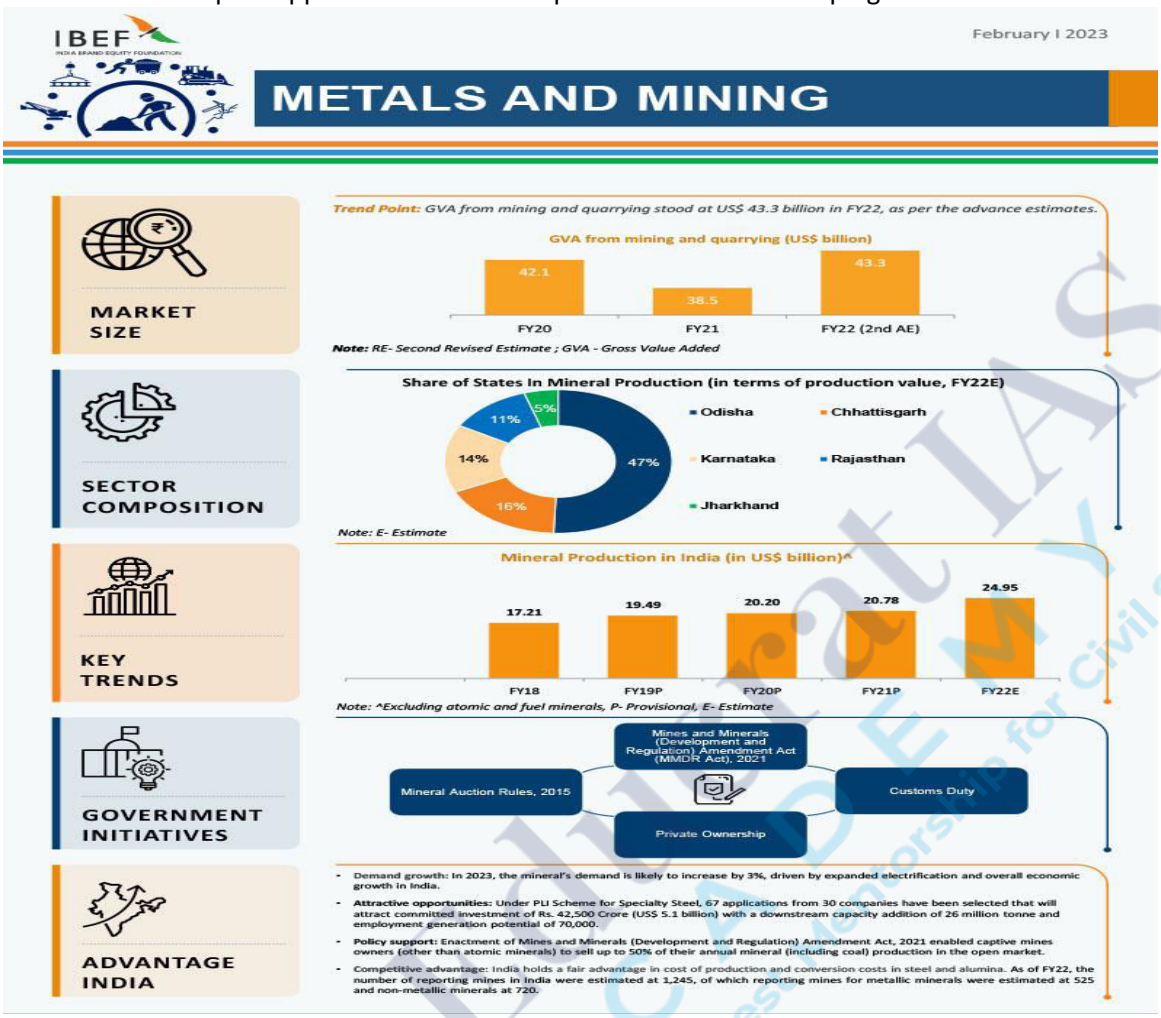
What is the Scenario of the Mining Sector in India?

- **Backbone of Manufacturing:**
  - The mining industry plays a **crucial role in the country's economy,** serving as the backbone for the manufacturing and infrastructure sectors.
  - The mining and quarrying sector contributes **around 2.5% of the Gross Domestic Product (GDP).**
- **Scope:**
  - India ranks **4th globally** in terms of iron ore production and is the world's 2nd largest coal producer as of 2021.
    - Combined Aluminum production (primary and secondary) in India stood at 4.1 MT per annum in FY21 becoming the **2nd largest in the world.**
  - As per World Mineral Production, 2016-20, British Geological Survey, **India's ranking in 2020 in world production in terms of quantity.**

Mineral/Resource	**Production Rank in 2020**
Coal & Lignite	2nd
Steel (Crude/Liquid)	2nd
Zinc (Slabs)	3rd
Aluminium (Primary)	3rd
Chromite Ores & Concentrate	4th
Iron Ore	4th
Graphite	4th
Manganese Ore	5th
Bauxite	6th

Copper (Refined)	7th

- In 2023, the mineral's demand is likely to increase by 3%, driven by expanded electrification and overall economic growth in India.
  - India holds a fair advantage in production and conversion costs in steel and alumina. Its strategic location enables export opportunities to develop as well as fast-developing Asian markets.



8. Bio-Decomposer to Address Stubble Burning

Why in News?

Recently, the Delhi Government has initiated the spraying of a **Bio-Decomposer** to tackle **Stubble Burning**. However, the effectiveness of the microbial solution largely depends on its timing of application, according to farmers.

- Stubble burning in Delhi is not a **major contributor to its pollution levels,** with a minimal number of instances reported in recent years.

What is the Issue of Stubble Burning?

- **About:**
  - **Stubble (parali)** burning is a method of **removing paddy crop residues** from the field to sow wheat from the **last week of September to November,** coinciding with the withdrawal of **Southwest Monsoon**.
  - Stubble burning is a **process of setting on fire the straw stubble,** left after the harvesting of grains, like paddy, wheat, etc. It is usually required in areas that use the combined harvesting method which leaves crop residue behind.
  - It is a common **practice in October and November across North West India,** but primarily in Punjab, Haryana, and Uttar Pradesh.
- **Effects of Stubble Burning:**
  - **Pollution:** Emits large amounts of toxic pollutants in the atmosphere which contain harmful gases like **methane (CH4), Carbon Monoxide (CO), Volatile Organic compounds (VOC)** and carcinogenic polycyclic aromatic hydrocarbons.

- These pollutants disperse in the surroundings, may undergo a physical and chemical transformation and eventually adversely affect human health by causing a thick blanket of smog.
  - **Soil Fertility:** Burning husk on the ground destroys the nutrients in the soil, making it less fertile.
  - **Heat Penetration:** The heat generated by stubble burning penetrates into the soil, leading to the loss of moisture and useful microbes.
- **Alternatives to Stubble Burning:**
  - **In-Situ Treatment of Stubble:** For example, crop residue management by zero-tiller machine and Use of bio-decomposers.
  - **Ex-Situ (off-site) Treatment:** For example, Use of rice straw as cattle fodder.
  - **Use of Technology:** For example, Turbo Happy Seeder (THS) machine, which can uproot the stubble and also sow seeds in the area cleared. The stubble can then be used as mulch for the field.

What is Bio-Decomposer to Tackle Stubble Burning?

- **About:**
  - Biodecomposer is designed to accelerate the **natural decomposition process of crop residues.**
  - It is typically a **concoction of various microorganisms like fungi, bacteria, and enzymes** that work together to **break down the plant material** into organic matter that enriches the soil.
  - **Examples:**
    - **Bacteria:** Bacillus, Clostridium, E. coli, Salmonella
    - **Fungi:** Mushrooms, Molds, Yeasts
    - **Earthworms**
    - **Insects:** Beetles, Flies, Ants, Maggots
    - **Arthropods:** Millipedes, Woodlice
- **Pusa-Biodecomposer:**
  - It is a **fungi-based liquid solution** that can soften **hard stubble** to the extent that it can be easily mixed with soil in the field to act as compost.
    - The fungi thrive at 30-32 degrees Celsius, which is the temperature prevailing when paddy is harvested and wheat is sown.
  - It produces enzymes to digest cellulose, lignin and pectin in paddy straw.
    - It was developed by the **Indian Council of Agricultural Research (ICAR)** and named after **ICAR's campus at Pusa in Delhi.**
  - It rapidly converts crop residues, animal waste, dung and other waste into organic manure.

- **Benefits:**
  - The decomposer **improves the fertility and productivity** of the soil as the stubble works as manure and compost for the crops and lesser fertiliser consumption is required in the future.
  - It is an efficient and **effective, cheaper, doable and practical technique** to stop stubble burning.
  - It is an eco-friendly and environmentally useful technology and will contribute to achieving the **Swachh Bharat Mission.**
- **Efficacy:**
  - The microbial solution aims to decompose paddy straw left in the field post-harvest. It needs to be sprayed after harvest, ploughed into the soil, and lightly **irrigated for the stubble to decompose over a period of 20-25 days.**
  - Farmers have emphasized the importance of aligning the spraying process with the timing of **harvest to maximize the effectiveness of the decomposer.**
  - Factors like crop rotation, labour availability, and the type of crop grown **affect the relevance and usability of the decomposer** for farmers.
  - The effectiveness of the microbial solution is also **dependent on weather conditions,** with less rain in September and October favouring its application.

What are the Other Initiatives to Tackle Stubble Burning?

- The State Governments of Punjab, National Capital Region (NCR) States and the Government of National Capital Territory of Delhi (GNCTD) have developed **detailed monitorable action plans** based on the framework by the Commission for Air Quality Management (CAQM) to tackle the problem of air pollution.

Way Forward

- It is important to encourage farmers to **adopt alternative farming practices** such as zero tillage, direct seeding, and crop diversification. These practices can reduce the generation of crop residue and minimize the need for stubble burning.
- Promote the use of **modern harvesting machinery** like combine harvesters that can cut crops at a lower height, leaving less stubble behind. This can significantly reduce the need for stubble burning.
- Conduct awareness campaigns to educate farmers about the harmful effects of stubble burning and the available alternatives. Engage with farmer groups, agricultural universities, and local communities to disseminate information effectively.

9. Odhuvars in Tamil Nadu

Why in News?

Recently, the Tamil Nadu government handed over appointment orders to **15 Odhuvars** (among them five are women), who were assigned to **Shaivite temples** in the Chennai region as they **serve the deities by singing hymns and praise.**

Who are Odhuvars in Tamil Nadu?

- **About:**
  - Odhuvars sing devotional hymns in Tamil Nadu's Hindu temples but are **not priests.** They are in the service of Lord Shiva by singing his **praise from Thirumurai in Saivite temples**. They sing devotional hymns **but do not enter the sanctum sanctorum.**
- **Origin of Odhuvars:**
  - The tradition of Odhuvars can be traced back to ancient times, **with its roots firmly embedded in the Bhakti movement**, which flourished **between the 6th and 9th centuries in Tamil Nadu.**
  - During this period, **several saint-poets known as Alwars and Nayanars** composed devotional hymns in **praise of Lord Vishnu and Lord Shiva, respectively.** The Odhuvars emerged as **custodians of this rich musical and devotional heritage.**

Alvars and Nayanars: The Saints of Tamil Bhakti Tradition

- **Alvars:**
  - **Devotion to Lord Vishnu:** The Alvars were a group of **twelve Vaishnava (devotees of Lord Vishnu) saint-poets.** Their compositions primarily centred on their deep devotion to Lord Vishnu and emphasized the **concept of surrender (*prapatti*) to attain salvation.**
  - **Poetic Works:** The Alvars' devotional hymns and poems were collected in the **Naalayira Divya Prabandham**, a significant Vaishnavite scripture. These hymns were composed in the Tamil language and celebrated the divine qualities and forms of Lord Vishnu.
- **Nayanars:**
  - **Devotion to Lord Shiva:** The Nayanars were a group of **sixty-three Shaiva (devotees of Lord Shiva) saint-poets.** They were deeply devoted to Lord Shiva and composed hymns and poems in praise of him, emphasizing the path of **bhakti (devotion) and love for the divine.**
  - **Poetic Works:** The Nayanars' hymns and poems were collected in the **Thirumurai, a corpus of Shaivite scriptures.** These compositions, written in Tamil, celebrated the various manifestations and attributes of Lord Shiva.

What is the Significance of Odhuvars in Present Context?

- **Religious Significance:** Odhuvars continue to hold a crucial place in the daily and festive rituals of Tamil Nadu temples. **They are responsible for reciting Thevaram and Thiruvasagam**, two ancient Tamil texts filled with hymns and praises for Lord Shiva.
- **Community Engagement:** Odhuvars often come from **marginalized communities, and their role in temples offers economic opportunities.** Moreover, their performances bring the local community together**, fostering a sense of unity and belonging.**
- **Preservation of Tamil Language:** Odhuvars contribute to the preservation of the Tamil language. Through their recitations, they ensure that the ancient Tamil texts are **understood and appreciated by successive generations.**
- **Promotion of Devotion:** Odhuvars help create a devotional atmosphere within the temples. Their soul-stirring renditions instil a **sense of piety and spiritual connection among the worshippers.**

What are the Challenges and Issues of Odhuvars in Tamil Nadu?

- **Economic Vulnerability:**
  - Many Odhuvar families struggle to make ends meet, as their **income depends largely on temple donations and offerings.** This economic vulnerability can lead to the decline of the tradition.
- **Lack of Recognition:**
  - The Odhuvars' contribution to temple rituals and preservation of Tamil culture often goes unnoticed. **They receive limited recognition**, which can be demotivating.
- **Declining Interest:**
  - The younger generation may not be as interested in continuing the tradition, as it can be financially unstable and offers limited social prestige. **This raises concerns about the continuity of the tradition.**
- **Technology and Modernization:**
  - The advent of recorded music and modernization has altered the way people consume religious and devotional content. **Odhuvars may find it challenging to compete with digital media** and contemporary musical forms.
- **Lack of Institutional Support:**
  - Recognised government institutions like **Sangeet Natak Academy** etc. have been **non-committal to Odhuvar's concerns** as their expertise and competence in the field can alleviate the suffering of the community.

10. Marine Cloud Brightening

Why in News?

The concept of **marine cloud brightening** has gained prominence recently as a tactic for **addressing extreme ocean heat** and as a way to **reduce coral bleaching and safeguard marine ecosystems.**

What is Marine Cloud Brightening?

- **About:**
  - The concept of **cloud brightening** traces back to British cloud physicist John Latham, who **proposed this idea in 1990** as a **means to control global warming** by altering the Earth's energy balance.
  - Latham's calculations suggested that **brightening clouds over vulnerable ocean regions could counteract the warming** caused by a doubling of pre-industrial atmospheric carbon dioxide.
- **Mechanism of Marine Cloud Brightening:**
  - In **clean maritime air**, clouds primarily form from **sulfates and sea salt crystals,** which are **relatively scarce**, leading to **larger droplets with lower light reflection.**
  - **Marine cloud brightening (MCB)** seeks to boost marine cloud reflectivity (albedo), **making clouds whiter and brighter.**
    - It involves using **water cannons or specialized vessels to release fine seawater droplets** into the atmosphere.
    - As these droplets evaporate, **they leave behind salt particles,** serving as cloud condensation nuclei that foster the formation of denser, brighter clouds.

Note

Warm clouds consist of numerous small suspended water droplets. These droplets form around **tiny airborne particles known as "aerosols,"** which can be natural (like dust, sea salt, pollen, ash, and sulfates) or human-made (from activities like burning fossil fuels and manufacturing).

- A cloud of many small droplets is **brighter than one with fewer large droplets** even if both clouds contain the same amount of water overall.
- **Potential Benefits:**
  - MCB has the **potential to lower sea surface temperatures** in targeted areas, potentially **reducing the frequency and severity of coral bleaching events.**
    - This could **provide a lifeline for corals,** enabling their survival and recovery while the world transitions away from fossil fuels.
  - Researchers are exploring the viability of MCB for the Great Barrier Reef through modelling studies and small-scale experiments.
    - The **Great Barrier Reef**, a **UNESCO World Heritage Site**, has been particularly vulnerable to coral bleaching, experiencing mass bleaching events in recent years.

Note

Surprisingly, humanity is already unintentionally engaged in cloud brightening. The **Intergovernmental Panel on Climate Change** estimates humanity's unintentional **release of aerosols** offsets around **30% of the warming effect due to greenhouse gases.**

- **Sulphates in ship** exhaust are such a potent source of aerosols for droplet formation, that passage of ships leaves cloud trails called **ship tracks.**
- **Challenges and Risks Associated with MCB:**
  - **Technical Feasibility:** MCB involves the large-scale spraying of seawater into the atmosphere at significant altitudes, which presents **engineering complexities in terms of design, cost, maintenance**, and operation of the spraying devices.
  - **Environmental Impacts:** Alterations in cloud patterns and precipitation due to MCB could **affect regional climate and hydrological cycles**, potentially causing unintended consequences like droughts or floods.
  - **Ethical Issues:** MCB raises **ethical dilemmas about human intervention in natural processes** and the governance and decision-making processes surrounding its implementation.
  - **Moral Hazard:** MCB might lead to **complacency among policymakers and the public,** diminishing their commitment to reducing greenhouse gas emissions and adapting to climate change.

What is Coral Bleaching?

- **Coral bleaching** is a phenomenon where corals, **typically vibrant and colourful,** lose their colour and turn white due to stress, often caused by elevated sea temperatures.
  - This occurs when the **corals expel the symbiotic algae** living within their tissues, which provide them with nutrients and colour.
- **Coral bleaching weakens the corals,** making them more susceptible to disease, and can lead to their death if the stress continues.

Conclusion

MCB is still in the early stages of research and development, requiring additional studies to assess its **feasibility, efficacy, impacts, risks, and governance.** It is essential to recognize that **MCB is not a standalone solution but a potential complementary measure** to help coral reefs confront extreme heat stress in the short term. MCB should be integrated into a comprehensive approach that includes **conservation, restoration, adaptation, and innovation to safeguard coral reefs from the impacts of climate change.**

11. International Migration Outlook 2023

Why in News?

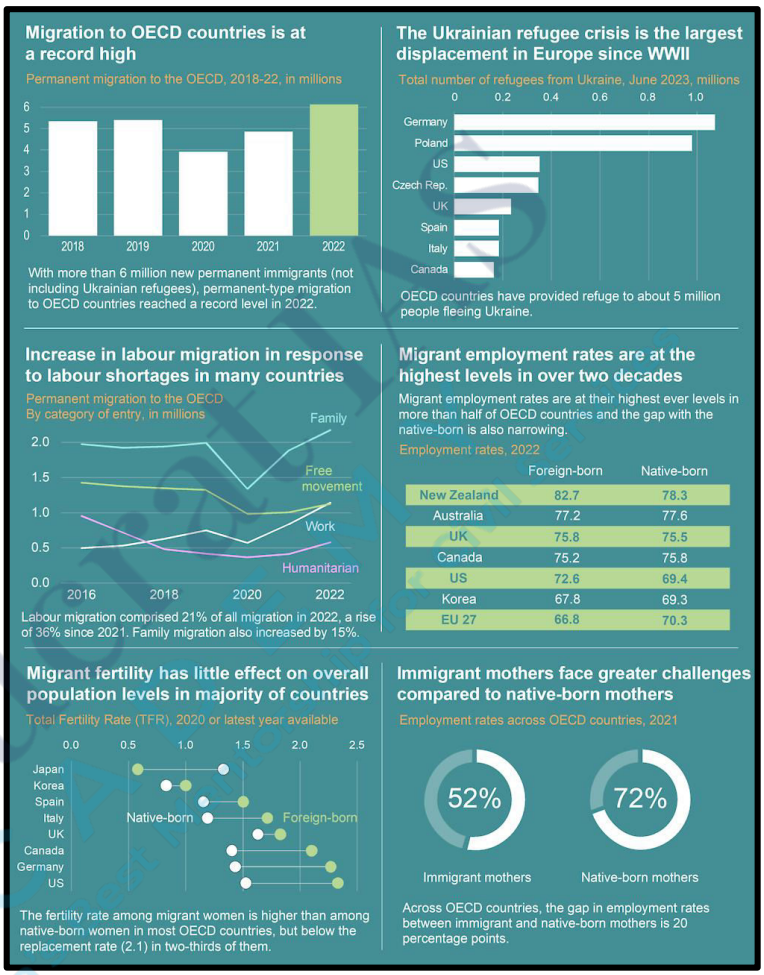
Recently, **International Migration Outlook 2023**, a report on international migration patterns was released by the **Organisation for Economic Co-operation and Development (OECD)** to analyze the migration trends worldwide.

What are the Highlights of the Report?

- **India Leads in Migration to OECD Countries:**
  - In 2021 and 2022, India became the primary source of migration to OECD countries, surpassing China. India consistently topped the list **with 0.41 million new migrants in both years, while China had 0.23 million new migrants,** followed by Romania with approximately 200,000 new migrants.
- **Climate-Induced Displacement and Policy Responses:**
  - The report sheds light on the **increasing focus on policy responses to climate-induced displacement in recent years.** Few OECD countries have explicit policies to address this issue.
  - Notably, **Colombia began discussing a pioneering bill in April 2023**, aiming to recognize and support climate-displaced individuals, with a broad definition and provisions for housing, healthcare, education, and a national register.
- **Record Refugee Inflows and Worker Migration:**
  - The **OECD region experienced record refugee inflows due to the Russia-Ukraine war,** with over 10 million people becoming internally displaced or refugees. Worker migration saw significant increases from India, Uzbekistan, and Turkey, making them prominent source countries following Ukraine.
- **Recent Trends in International Migration:**
  - All top four destination countries **(The United States, Germany, the United Kingdom and Spain)** registered large year-on-year increases, between 21% and 35%. The increase was smaller in Canada (8%) the fifth destination country.

- The United States **alone accounted for 1.05 million new permanent-type migrants,** and the other four countries for between 440 000 and 650 000 each.

- **Permanent-Type Migration by Main Categories:**
  - In 2022, **family migration** remained the primary category of entry for new permanent-type migrants, **representing 40%** of all permanent-type migration, a relatively stable share over time.
  - The share of **labour migration** has increased over time. While in 2022, **labour migration represented 21% of permanent-type migration, it accounted for only 16% in 2019.**
  - Conversely, the share of **free movement migration** (within the **EU-EFTA** and between Australia and New Zealand) has decreased since 2020. It accounted for **21% of permanent-type migration in 2022, compared with 28% in 2019.**



What is OECD?

- **About:**
  - The OECD is an **intergovernmental economic organisation**, founded to stimulate economic progress and world trade.
  - Most OECD members are high-income economies with a very high **Human Development Index (HDI)** and are regarded as developed countries.
- **Foundation:**
  - It was founded in 1961 with its **Headquarters in Paris, France and its total membership is 38 countries.**
  - The most recent countries to join the OECD were Colombia, in April 2020, and Costa Rica, in May 2021.
  - **India is not a member, but a key economic partner.**
- **Reports and Indices by OECD:**
  - Government at a Glance
  - OECD Better Life Index.

12. Atal Bhujal Yojana and Ground Water Management

Why in News?

Recently, the 5th meeting of the **National Level Steering Committee (NLSC)** of **Atal Bhujal Yojana (ATAL JAL)** was held to review the overall progress of the scheme.

- The **World Bank** has been involved in the review of the program. The committee encouraged states to integrate **Water Security Plans (WSPs)** into the Gram Panchayat Development Plans which will ensure the sustainability of the scheme's approach even after the program's completion.

What is Atal Bhujal Yojna?

- **About:**
  - ATAL JAL is a **Central Sector Scheme** for facilitating sustainable groundwater management with an outlay of ₹ 6000 crore.
  - It is being implemented by the **Ministry of Jal Shakti.**
    - The scheme is being funded by the **Government of India** and the **World Bank** on a **50:50** basis.
    - The entire World Bank's loan component and central assistance will be passed on to the States as grants.
- **Objectives:**

- It aims to improve the management of groundwater resources in select water-stressed areas in identified states viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.
- ATAL JAL promotes **panchayat-led** groundwater management and **behavioural change** with a primary focus on demand-side management.

What is the Status of Groundwater Depletion in India?

- **Groundwater Depletion** in India is a **major concern** because it is the primary source of drinking water. Some of the main causes of groundwater depletion in India include over-extraction of groundwater for irrigation, **Urbanisation, and Climate Change.**
- **India is the world's largest user of groundwater**, exceeding the use of the United States and China combined according to a **recent UN report.**
- **According to the Central Ground Water Board (CGWB)** of India, approximately 70% of the total water used in India is from groundwater sources.
  - However, the CGWB also estimates that around 25% of the country's total **groundwater extraction is unsustainable**, meaning that it is being extracted at a faster rate than it can be replenished.
- Overall, groundwater depletion in India is a **serious problem that needs to be addressed through sustainable water management practices,** such as improved irrigation techniques and conservation efforts.

What are the Major Causes of Groundwater Depletion in India?

- **Over-extraction of Groundwater for Irrigation:**
  - Irrigation accounts for around **80% of total water use in India,** and much of this water is sourced from groundwater.
  - As demand for food continues to grow, more and more groundwater is being extracted for irrigation, leading to depletion.
    - According to the **UN's Interconnected Disaster Risks Report 2023**, 78% of wells in Punjab are considered overexploited, and the north-western region as a whole is predicted to experience critically low groundwater availability by 2025.
- **Climate Change:**
  - Rising temperatures and **Changing Precipitation Patterns** can alter the recharge rates of **Groundwater Aquifers,** making them more vulnerable to depletion.
  - Droughts, flash floods, and **Disrupted Monsoon Events** are recent examples of climate change events that are placing pressure on India's groundwater resources.
- **Poor Water Management:**
  - Inefficient use of water, leaky pipes, and inadequate infrastructure for capturing and storing rainwater can all contribute to groundwater depletion.
- **Decrease in Natural Recharge:**
  - The natural recharge of groundwater aquifers can be decreased by factors such as **Deforestation**, which can lead to **Soil Erosion** and reduce the amount of water that is able to seep into the ground and replenish the aquifers.

What are the Issues Associated with Depleting Ground Water?

- **Water Scarcity:** As groundwater levels drop, there may not be enough water available for domestic, agricultural, and industrial use. This can lead to **water shortages and conflicts** over water resources.
  - A study led by the University of Michigan warns that if **Indian farmers continue to draw groundwater at the current rate**, the rate of groundwater depletion could triple by 2080. This could have severe implications for the **country's food and water security, as well as the livelihoods of over one-third of its population.**
- **Land Subsidence:** When groundwater is extracted, the **soil can become compacted, leading to Land Subsidence** (the sinking or settling of the land). This can cause damage to infrastructure, such as roads and buildings, and can also increase the risk of flooding.
- **Environmental Degradation:** Depleting groundwater can also have negative impacts on the environment. For example, when groundwater levels drop, it can cause **Saltwater Intrusion** in coastal areas, leading to the contamination of freshwater resources.
- **Economic Impacts:** Groundwater depletion can also **have economic impacts,** as it can lead to reduced agricultural production and increased costs for water treatment and pumping.
- **Lack of Depletion Data:** The Indian government regulates **groundwater exploitation by "notifying" highly overexploited blocks** in water-stressed states.
  - However, only about 14% of overexploited blocks are currently notified.

- **Earth's Axis to Tilt:** According to a recent study in Geophysical Research Letters, it is claimed that excessive pumping of groundwater has caused the **Earth's axis to tilt nearly 80 centimetres east** between 1993 and 2010 alone and contributes to sea level rise.

What are the Government Initiatives Related to Groundwater Conservation?

- Pradhan Mantri Krishi Sinchayee Yojana,
- Jal Shakti Abhiyan- Catch the Rain Campaign,
- Aquifer Mapping and Management Programme,
- Atal Mission for Rejuvenation and Urban Transformation (AMRUT).

Way Forward

- Embrace **comprehensive and sustainable water management strategies** that address both immediate needs and long-term challenges.
- Foster **meaningful engagement with local communities**, incorporating their perspectives and knowledge in water management decisions.
- Prioritize **investments in water infrastructure** and capacity-building programs to build resilience against future water crises.
- Establish **robust monitoring and evaluation frameworks** to assess the effectiveness and impact of water management initiatives.
- Promote responsible **groundwater management and conservation practices** to ensure water availability for future generations.

13. Sikkim Dam Disaster Raises Concerns for India's Bhutan Hydropower Projects

Why in News?

The recent **glacial lake outburst flood (GLOF)** in Sikkim has washed away the 1200-MW Teesta-III dam.

- The **National Green Tribunal (NGT)** has issued notices to key stakeholders, including the **National Hydroelectric Power Corporation (NHPC) that** previously dismissed any GLOF threats.
- The collapse of a dam in Sikkim has raised **concerns over the safety and feasibility of India's hydroelectric projects in Bhutan,** which are vital for meeting the energy needs of both countries.

Why Did NGT Issue Notices to Teesta-III Dam Stakeholders?

- The NGT has summoned three pivotal stakeholders (the Sikkim government, Sikkim Urja Limited (responsible for Teesta-III), and NHPC) to address the situation.
- NHPC had **previously downplayed the risk of GLOFs in the region.**
- In 2014, when NHPC's 520 MW Teesta-IV project faced a challenge to its **environmental clearance**, NHPC, in an affidavit to the NGT, said that projects below **Chungthang (Teesta-III)** faced no threat from GLOFs.
    - Apparently convinced, the NGT dismissed the appeal against Teesta-IV's environment clearance in 2017.

What is the National Green Tribunal (NGT)?

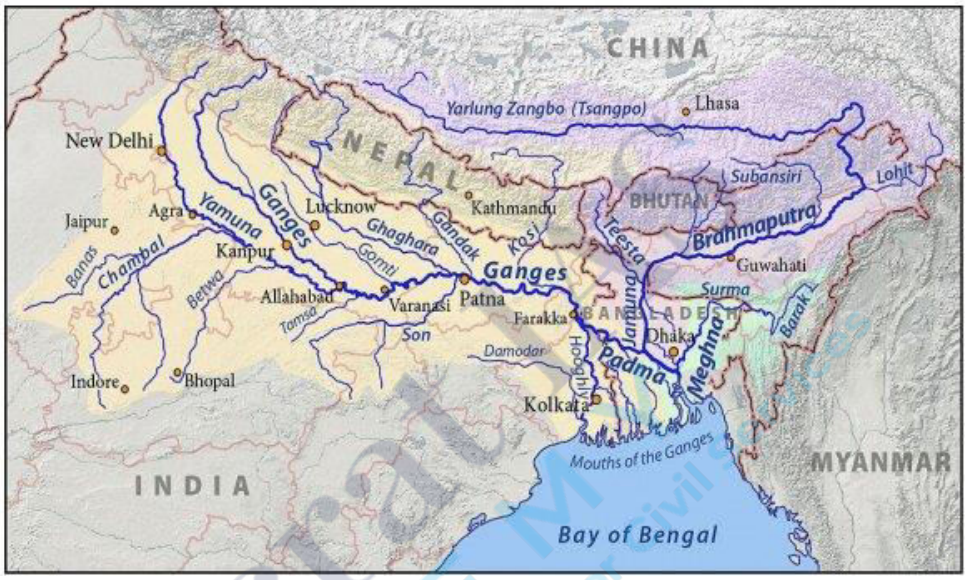
- **About:**
    - The NGT is a specialized body set up under the **National Green Tribunal Act, 2010** for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.
    - The NGT has five places of sitting: **New Delhi (principal bench), Bhopal, Pune, Kolkata and Chennai.**
- **Structure:**
    - The Tribunal comprises the **Chairperson, the Judicial Members and Expert Members.**
        - The Chairperson is appointed by the Central Government in consultation with the **Chief Justice of India (CJI).**
        - A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
    - The total number of members in **NGT should not be less than 10 and not more than 20**. Each member holds **office for five years or until they attain the age of 70 years,** whichever is earlier and are not eligible for reappointment.
- **Powers and Functions:**

- It has the power to hear cases relating to various environmental laws, such as the **Water Act, 1974**; the **Environment Protection Act, 1986**; the **Forest Conservation Act, 1980**; the **Biological Diversity Act, 2002; etc.**
- It has the power to issue orders, directions or writs for enforcing any legal right relating to the environment or preventing or remedying any environmental damage.
  - It has the power to award relief or compensation to the victims of environmental harm or pollution.
  - It has the power to review its own decisions or orders.

What are the Key Facts about the Teesta River and Teesta-III Dam?

- **Teesta River:**
  - **The Teesta River** is a tributary of the **Brahmaputra (known as Jamuna in Bangladesh),** flowing through India and Bangladesh.
  - It originates in the **Himalayas** near Chunthang, Sikkim and flows to the south through West Bengal before entering Bangladesh.
    - Originally, the river continued southward to empty directly into the Padma River (the main channel of **Ganga** in Bangladesh) but around 1787 the river changed its course to flow eastward to join the Jamuna River.

The Ganges-Brahmaputra Basin



  - The Teesta River water conflict is one of the most contentious issues between India and Bangladesh.
  - **Tributaries:** Zemu Chhu, Rangyong Chhu, Rangit River, Lachung Chhu, Chakung Chhu.

- **Teesta-III Dam:**
  - It is a **hydroelectric project built on the Teesta River** in Chungthang, Sikkim. India. It has an installed capacity of 1,200 MW. The dam was the highest in Sikkim.
  - **Impact of the GLOF in Sikkim:**
    - The GLOF that occurred in Sikkim washed away the **1200-MW Teesta-III** and caused severe damage to NHPC projects downstream, including the **510 MW Teesta-V and the under-construction 500 MW Teesta-VI.**

How Does Sikkim's Dam Disaster Affect India's Hydropower Projects in Bhutan?

- The Sikkim dam disaster raises significant concerns about the safety and viability of India's ongoing hydropower projects in Bhutan.
- The dam collapse has cast a shadow over two of three India-assisted, under-construction mega hydropower projects in Bhutan — the 1,200 MW **Punatsangchhu Stage-I (Puna-I) and the 1,020 MW Punatsangchhu Stage-II (Puna-II) on Punatsangchhu River.**
- These projects are part of a **2006 agreement between India and Bhutan to develop 10,000 MW of hydropower by 2020,** which was later **revised to 2027.**
- These projects are expected to **provide cheap and clean electricity to India**, which has a power deficit of about 10%, as well as generate revenue for Bhutan, which earns more than half of its GDP from hydropower exports to India.
- However, **these projects have also faced delays and cost overruns** due to geological challenges, technical issues and environmental concerns.
- Bhutan's Prime Minister, acknowledges the need to re-evaluate the geological surveys.

Way Forward

- **Strengthen Safety Protocols:** Enhance safety measures and perform rigorous geological assessments for ongoing and future hydropower projects.
- **Collaborative Efforts:** India and Bhutan should work together to re-evaluate geological surveys, possibly with the involvement of international experts.
- **Technical Expertise:** Invest in building technical expertise in addressing glacial lake outburst floods (GLOFs) and incorporate this knowledge into project planning.
- **Environmental Impact Studies:** Conduct comprehensive environmental impact studies for hydropower projects in ecologically sensitive areas like the Himalayas.
- **Regular Review:** Establish a framework for regular reviews and assessments of ongoing projects, ensuring lessons from past incidents are considered.

GS Paper – 2

1. Nobel Prize in Medicine 2023

Why in News?

The **Nobel Prize in Medicine or Physiology** for 2023 has been awarded to **Katalin Karikó and Drew Weissman** for their ground-breaking work on **nucleoside base modification of messenger Ribonucleic Acid (mRNA).**

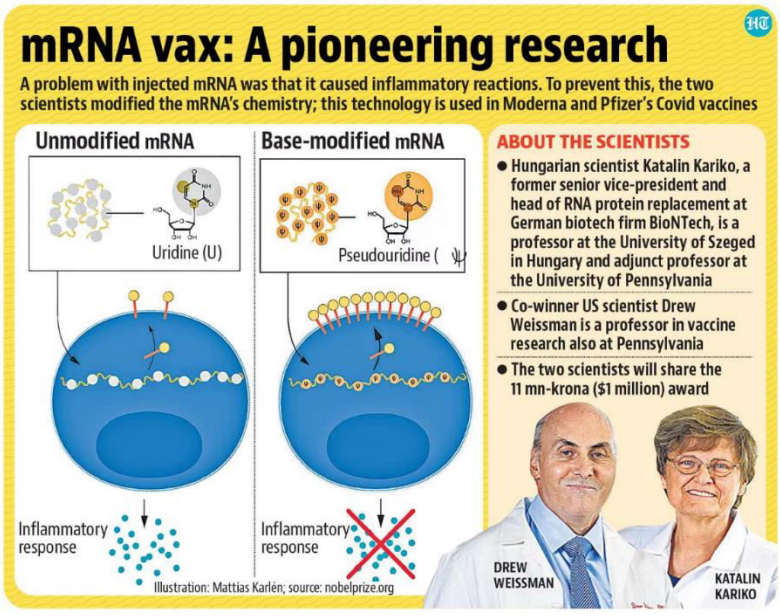
- The discoveries by the two Nobel Laureates were critical for developing effective **mRNA vaccines against COVID-19** during the pandemic that began in early 2020.

What Did Katalin Karikó and Drew Weissman Discover?

- **Understanding the Challenge:**
  - Cells possess an inherent capability to **detect foreign materials. Dendritic cells,** which play a crucial role in our immune system, had the ability to recognize **in vitro transcribed mRNA as foreign,** setting off an i**nflammatory response.**
    - This reaction could potentially lead to harmful side effects and **undermine the vaccine's efficacy.**
  - Furthermore, another challenge stemmed from the fact that in vitro transcribed mRNA was highly unstable and susceptible to degradation by enzymes within the body.

Note

- **In vitro transcribed mRNA** is a type of synthetic RNA that is **produced in the laboratory** by using a DNA template and an RNA polymerase.
- It can be used for various purposes, such as **making RNA probes, vaccines, or proteins.**
- **Katalin Karikó and Drew Weissman's Discovery**:
  - Karikó and Weissman observed that **dendritic cells identify in vitro transcribed mRNA as foreign,** activating them and causing the release of inflammatory signals.
  - They questioned why this **mRNA was considered foreign, unlike mRNA from mammalian cells**, which didn't trigger the same response.
    - Mammalian cells are **eukaryotic cells** that belong to the **animal kingdom** and have a nucleus and other membrane-bound organelles.
  - This led them to realize that **there must be distinct properties separating the two mRNA types.**
- **The Breakthrough:**
  - RNA, like **Deoxyribonucleic acid (DNA)**, consists of **four bases: A, U, G, and C.** Karikó and Weissman noticed that **natural RNA from mammalian cells often had chemical modifications in its bases.**
  - They hypothesized that the **absence of these modifications** in lab-made mRNA might **cause inflammatory reactions.**
  - To test this, they created various mRNA variants with unique chemical alterations and delivered them to dendritic cells. Their results showed a **significant reduction in inflammatory responses** when **base modifications were included in the mRNA.**
  - This discovery transformed our understanding of how cells recognize and respond to different types of mRNA, with profound implications for mRNA's therapeutic potential.
  - Their subsequent studies in 2008 and 2010 demonstrated that mRNA with **base modifications led to increased protein production.**
  - This effect was attributed to the **reduced activation of an enzyme involved in protein production.**
  - Karikó and Weissman's research removed critical obstacles, making **mRNA more suitable for clinical applications.**



- **Application of Base-modified mRNA Vaccines:**
  - Interest in mRNA technology grew, and by 2010, several companies were actively developing this method for various purposes.
  - Initially pursued **vaccines against diseases like Zika virus, which is closely related to SARS-CoV-2.**
  - With the onset of the COVID-19 pandemic, base-modified mRNA vaccines encoding the SARS-CoV-2 surface protein were developed at an unprecedented pace.
    - These vaccines demonstrated protective effects of approximately 95% and received approval as early as December 2020.
  - The remarkable flexibility and speed of mRNA vaccine development opened doors to potential use against other infectious diseases.
  - Collectively, more than **13 billion COVID-19 vaccine doses** have been administered worldwide, saving millions of lives and preventing severe illness.
  - This **transformative development during a major health crisis** highlights the critical role played by this year's Nobel laureates in recognizing the importance of base modifications in mRNA.

What are mRNA Vaccines and how do they Work?

- mRNA stands for **messenger RNA,** a molecule that carries **genetic information from DNA to the protein-making machinery of the cell.**
- mRNA vaccines use synthetic mRNA that encodes a **specific protein from a pathogen,** such as the **spike protein of the coronavirus.**
  - When the mRNA vaccine is injected into the body, some of the cells take up the mRNA and use it to produce the protein. The protein then triggers an **immune response** that produces **antibodies and memory cells that can recognize and fight the pathogen in the future.**
- mRNA vaccines are faster and cheaper to produce, as they do not require cell culture or complex purification processes.
- mRNA vaccines are also more flexible and adaptable, as they can be easily modified to target new variants or strains of pathogens.

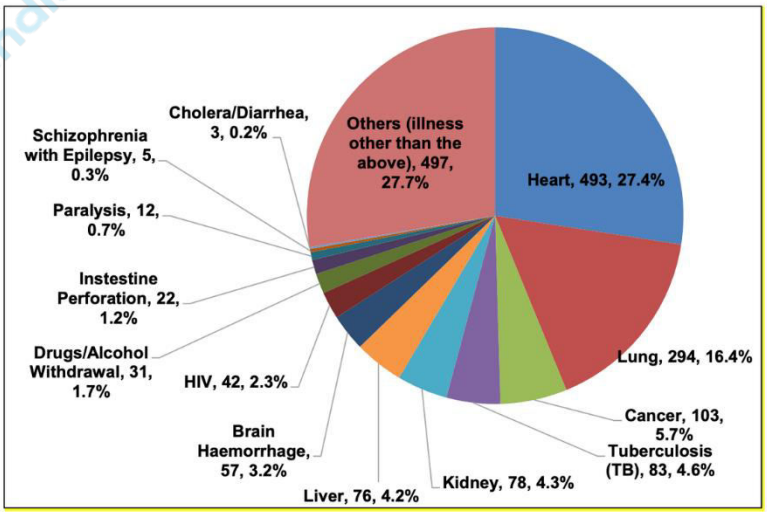
2. Deaths in India's Prisons

Why in News?

Recently, the **Supreme Court Committee on Prison Reforms** has found suicide to be one of the leading causes of Unnatural Deaths among Indian prisoners.

How are Prison Deaths Classified?

- **Prison Deaths** are labelled as **Natural or Unnatural** by the Prison Statistics India report published by the **National Crime Records Bureau (NCRB)** every year.
  - In 2021, a total of 2,116 prisoners died in judicial custody, with almost 90% of cases recorded as natural deaths.
- **Natural Deaths** account for aging and illness. Illness has been further sub-categorized into diseases **such as heart conditions, HIV, tuberculosis, and cancer,** among others.
  - As the prison population swells, recorded natural deaths have increased from 1,424 in 2016 to 1,879 in 2021.
- **Unnatural Deaths are more diverse in classification, profiled as,**
  - Suicide (due to hanging, poisoning, self-inflicted injury, drug overdose, electrocution, etc.)
  - Death due to inmates
  - Death due to assault by outside elements



- As per data provided by States/UTs.

Deaths of Prison Inmates due to illness during 2021

- Death due to firing
- Death due to negligence or excesses
- Accidental deaths (natural calamities like earthquakes, snakebites, drowning, accidental falls, burn injuries, drug/alcohol consumption, etc.
  - The **suicide rate among inmates** was found to be **more than twice** in comparison to what is recorded in the general population.

How are Deaths Investigated?

- Since 1993, the NCRB has been required to intimate a custodial death within 24 hours, followed by post-mortem reports, magisterial inquest reports or videography reports of the post-mortem.
- In cases of custodial rape and death, the **Code of Criminal Procedure** also requires compulsory judicial magisterial inquiry in place of an executive magistrate inquiry.

What are the Efforts to Tackle Prison Death?

- **Judgment of Supreme Court**:
  - The Supreme Court in a 1996 judgment articulated the social obligation towards prisoners' health, noting that they suffer from a "double handicap":
    - "First, the prisoners do not enjoy the access to medical expertise that free citizens have. Their incarceration places limitations on such access; no physician of choice, no second opinions, and few if any specialists.
    - Secondly, because of the conditions of their incarceration, inmates are exposed to more health hazards than free citizens."
- **Government Efforts:**
  - The **Model Prison Manual of 2016** and the **Mental Healthcare Act of 2017**, outline inmates' right to healthcare.
    - This includes **adequate investment in healthcare facilities,** setting up mental health units, training officers to provide basic and emergency care, and formulating suicide prevention programmes to thwart such instances.
  - In light of rising suicide cases, the **NHRC in June 2023** issued an advisory to States, highlighting that **suicides arise out of both medical and mental health issues.**
    - The NHRC recommended filling positions of "Prison Welfare Officers, Probation Officers, Psychologists, and Medical Staff".

What are the NHRC's Recommendations Related to Prison Deaths?

- **Preventing Suicide Attempts:**
  - Regular checks and vigilance on bed sheets and blankets of inmates are advised to ensure that these items are not used in attempts to commit suicide.
- **Mental Health Training for Staff:**
  - A component of mental health **literacy should be included** in the basic training of prison staff. Periodic refresher courses are also recommended to keep staff informed and updated on **mental health-related matters.**
- **Regular Observation and Support:**
  - Regular observation of **inmates by prison staff is essential**, and assigning a prisoner 'buddy' who is trained in psychological first aid can provide critical support to those in need.
- **Gatekeeper Model Implementation:**
  - The Gatekeeper Model, devised by the **World Health Organization (WHO)**, should be adopted to strengthen mental health care in prisons.
  - This involves **training carefully selected inmates to identify fellow prisoners** who may be at risk of suicide, thereby facilitating early intervention and support.
- **Addressing Addiction Issues:**
  - Measures to **tackle addiction among prisoners** should be implemented, including regular visits by mental health care professionals and de-addiction experts to provide necessary support and interventions.
- **Life-Skill Education and Activities:**
  - Inmates should be provided with **life-skill-based education and engaging activities** such as **Yoga, Sports, crafts,** drama, music, dance, and suitable spiritual and optional religious instructions.
    - These activities help channel inmates' energies positively and occupy their time constructively. Collaboration with reputable **NGOs** can be sought to facilitate this.

Important Facts from Prison Statistics

- **Number of Prisons:**
  - The total number of prisons at the national level has increased from 1,306 in 2020 to 1,319 in 2021, having increased by 1.0%.
    - The highest number of jails was reported in Rajasthan (144) followed by Tamil Nadu (142) and Madhya Pradesh (131).
- **Capacity:**
  - The actual capacity of prisons has increased from 4,14,033 in 2020 to 4,25,609 in 2021, having increased by 2.8%.
  - Out of the total capacity of 4,25,609 in 1,319 prisons in 2021, the Central Jails of the country were having the highest capacity (1,93,536) followed by the District Jails and the Sub Jails.
- **Convicted Prisoners:**
  - The number of convicted prisoners **has increased from 1,12,589 in 2020 to 1,22,852 in 2021,** having increased by 9.1% during the period.
  - The highest number of convicted prisoners were lodged in Central Jails followed by District Jails and Sub Jails by December, 2021.
- **Undertrial Prisoners.**
  - The number of under-trial prisoners has increased from 3,71,848 in 2020 to 4,27,165 in 2021 having increased by 14.9% during this period.
  - Among the 4,27,165 under-trial prisoners, the highest number of under-trial prisoners was lodged in District Jails followed by Central Jails and Sub-Jails as of 31st December, 2021.
- **Detenues:**
  - The number of detenues has decreased from 3,590 in 2020 to 3,470 in 2021 (as of 31st December of each year), having decreased by 3.3% during this period. b. Among the 3,470 detenues, the highest number of detenues were lodged in Central Jails followed by District Jails and Special Jails as of 31st December, 2021.

Way Forward

- Regularly review and update policies to align with evolving needs and challenges.
- There is a need to invest in **training and capacity building for prison staff** to ensure better care and support for inmates.
- Fostering collaboration between government bodies, **NGOs, and healthcare professionals** to enhance mental healthcare and addiction management within prisons.
- Promote awareness and advocacy campaigns to reduce stigma around mental health and addiction, fostering a more empathetic environment within the prison system.
- Encourage research to identify emerging trends and effective interventions, supported by ongoing monitoring and evaluation of implemented measures.

3. Myths Regarding Micro-biome Research

Why in News?

In the last two decades, Micro-biome Research has gone from a **'Niche subject area' to 'one of the hottest topics** in all of science'.

- Microbial interactions and activities within the human gut have been the subject of extensive research and discussion.
- Contrary to popular misconceptions, recent assessments shed light on the complexity of the human micro-biome, challenging certain widely believed claims.

Note

- Under the Union Budget 2021-22, the government outlaid ₹ 1,660 crore for biotechnology research and development.

What is Micro-biome?

- **About**:
  - The **micro-biome is the community of Microorganisms** (such as fungi, bacteria and viruses) that exists in a **particular environment.**
  - In humans, the term is often used to describe the microorganisms that live in or on a particular part of the body, such as the skin or gastrointestinal tract.

- These groups of microorganisms are **dynamic and change in response to a host of environmental factors,** such as exercise, diet, medication and other exposures.

Myths Regarding Micro-biome in the Human Body:

- **The Age of the Field:**
  - One of the misconceptions is that Micro-biome Research is a new field. Scientists had described and **speculated on the benefits of bacteria inhabiting the gut**, such as Escherichia coli and Bifidobacteria, as early as the **late 19th and early 20th centuries.**
- **The Question of Origin:**
  - The term "micro-biome" in its modern form was used before its popularization in 2001, challenging the common attribution to Joshua Lederberg.
  - Joshua Lederberg is a **Nobel laureate in medicine**, with the naming of the field in 2001.
  - The term had been used in 1988 to describe a community of microbes.
- **The Number and Mass of Microbes:**
  - Some of the more prevalent and more harmful myths **concern the size of the micro-biome.**
  - The actual number of microbial cells in human faeces is around 1010 to 1012 per gram, and the **weight of the human micro-biota is about 200 grams**, not 1-2 kg as often stated.
- **From Mother to Child:**
  - Contrary to some opinions, mothers don't pass their micro-biomes to their children at birth.
  - Some **microorganisms are directly transferred during birth** but they constitute a small fraction of the human micro-biota, and only an even smaller fraction of these microbes survive and persist throughout the child's life.
  - Every adult ends up with a unique micro-biota configuration, even identical twins that are raised in the same household.
- **Microbes are Dangerous:**
  - Some researchers have suggested that diseases are caused by undesirable interactions **between microbial communities and our cells.**
  - But whether a microbe and its metabolite are 'good' or 'bad' depends on the context.
  - For example, **most humans carry a species of bacteria called** *Clostridium difficile* without any disease for life. It causes **problems only in the elderly or in people with compromised immune systems.**
- **The Firmicutes-Bacteroidetes Ratio:**
- One myth correlates obesity with the **ratio of two phyla of bacteria** — Firmicutes and Bacteroidetes.
- The problem with this myth is that the level of phyla is too broad to comment on effects with confidence.
- A phylum is a group within a kingdom. In the descending order of classifying organisms, **a kingdom comprises different phyla; a phylum comprises classes;** then there are **orders, families, genera, and, finally, species.**
- Even within a bacterial species, several strains behave differently, causing the host to manifest different clinical symptoms.
- **Functionality and Redundancy of Microbes:**
  - Not all microbes are functionally redundant; many functions are **specific to certain species within** the micro-biome.
  - Some researchers have claimed that different microbes are actually functionally redundant.
  - However, the different bacteria in the human micro-biome perform some common important functions, many functions are the preserve of a few species.
- **Bias in Sequencing:**
  - Sequencing in micro-biome research is not entirely unbiased; **biases can be introduced at various stages,** affecting the results and conclusions.
- **Standardized Methods in Micro-biome Research:**
  - While standardized methods are important for comparing findings across studies, no methodology is perfect, and it is crucial to acknowledge the limitations of the chosen method.
- **Culturing the Micro-biome:**
  - While it's challenging to grow microbes from the human micro-biome in the lab, there have been successful efforts in the past, indicating that current gaps in culture collections are due to a lack of previous effort rather than inherent 'unculturability'.

How the Human Micro-biome is linked with Bodily Functions?

- **Digestive Health and Nutrient Absorption:**
  - The gut micro-biome, primarily in the intestines, aids in breaking down complex carbohydrates, fibres, and other indigestible compounds that the human body can't process on its own.
  - Microbes assist in the fermentation process, producing essential nutrients such as vitamins (e.g., Vitamin B and K) that the body can absorb and utilize.
- **Immune System Regulation:**
  - The micro-biome interacts closely with the immune system, influencing its development, training, and responses.
  - A well-balanced micro-biome helps regulate immune responses, preventing inappropriate reactions and enhancing the ability to fight off infections.
- **Metabolic Health and Weight Regulation:**
  - The composition of the gut micro-biome has been linked to metabolic disorders like obesity and type 2 diabetes.
  - Certain microbes may affect metabolism, energy extraction from food, and storage of fats, ultimately impacting body weight and metabolic health.
- **Mental Health and Brain Function:**
  - The **gut-brain axis represents the bidirectional communication between the gut and the brain** through neural, hormonal, and immunological pathways.
  - The gut micro-biome can influence brain function, behaviour, and mental health conditions such as anxiety, depression, and stress by producing neurotransmitters and interacting with the central nervous system.

4. India, Iran and the Chabahar Port

Why in News?

India and Iran are making significant progress in **finalizing a 10-year pact for operations at the Chabahar port,** with key issues narrowing down.

- Additionally, the two nations are exploring ways to address the **depletion of Iran's rupee reserves**, which has impacted trade, especially in commodities like **rice, tea, and pharmaceuticals.**

What is the Significance of the Chabahar Port for India?

- **About:**
  - **Chabahar is Iran's only oceanic port.** It is situated in Sistan and Baluchistan Province, on the **Makran coast.**
  - There are two main ports in Chabahar – the **Shahid Kalantari port and the Shahid Beheshti port.**
    - The Shahid Kalantari port was developed in the 1980s.
    - Iran had offered India the project of developing the Shahid Beheshti port which was well received by India.
- **Progress and Updates Regarding the Chabahar Port Deal:**
  - The two countries signed an **initial agreement in 2016** for India to develop and operate the port's Shahid Beheshti terminal for 10 years.
  - However, the **finalization of the long-term agreement has been delayed by several factors** including **differences in some clauses in the pact.**
    - One of the main sticking points was the **clause related to jurisdiction for arbitration in case of disputes.**
    - India wanted the arbitration to be held in a neutral country, while Iran preferred its own courts or a friendly country.
  - According to some recent reports, India and Iran have narrowed the gap on the arbitration issue and are looking at the **option of taking up these matters at arbitration courts in a location such as Dubai.**

- They have also made progress on other issues, such as tariffs, customs clearance, and security arrangements.

Significance of Chabahar Port:

- **Alternative Trade Route:** Historically, India's access to Afghanistan and **Central Asia** has been largely **dependent on transit routes through Pakistan.**
  - The Chabahar Port offers an alternative route that bypasses Pakistan, reducing India's reliance on its neighbour for trade with Afghanistan and beyond.
  - This is particularly important given the often-tense relations between India and Pakistan.
  - Also, the Chabahar port will boost **India's access to Iran**, the key gateway to the **International North-South Transport Corridor** that has sea, rail and road routes between **India, Iran, Russia, Central Asia and Europe.**
- **Economic Benefits:** The Chabahar Port offers India a gateway to the resource-rich and economically vibrant region of Central Asia.
  - It can significantly enhance **India's trade and investment opportunities in these markets**, potentially leading to economic growth and job creation in India.
- **Humanitarian Assistance:** The Chabahar Port can serve as a crucial entry point for **humanitarian assistance and reconstruction efforts in Afghanistan.**
  - India can use the port to provide aid, infrastructure development support, and other assistance to Afghanistan, contributing to regional stability.
- **Strategic Influence**: By developing and operating the Chabahar Port, **India can enhance its strategic influence in the Indian Ocean region**, thus strengthening India's geopolitical position.

What is the Status of Economic Ties between India and Iran?

- **Status:**
  - Over the years, India's trade with Iran has seen significant fluctuations. In 2019-20, India's imports from Iran, primarily crude oil, **fell by about 90% to USD 1.4 billion compared to USD 13.53 billion in 2018-19.**
  - Also, Iran has seen a depletion of its **rupee reserves in the Vostro account**, affecting its ability to import key Indian commodities like basmati rice and tea.
- **Revival:**
  - To revive **trade between India and Iran**, which has been impacted by **US and Western sanctions**, both nations are considering the option of **Rupee-Rial trade**.
    - This move aligns with the **Reserve Bank of India's** decision to allow **invoicing and payments for international trade in Indian rupees in July 2022.**
  - Rupee-Rial trade refers to trade between India and Iran using their **respective currencies, the Indian Rupee (INR) and the Iranian Rial (IRR),** instead of using widely accepted international currencies like the US Dollar (USD).
    - This type of trade is often used when international sanctions or restrictions make it difficult for **countries to use global currencies for trade with a particular nation**, as was the case with Iran due to US sanctions.

5. The China-Tibet Issue

Why in News?

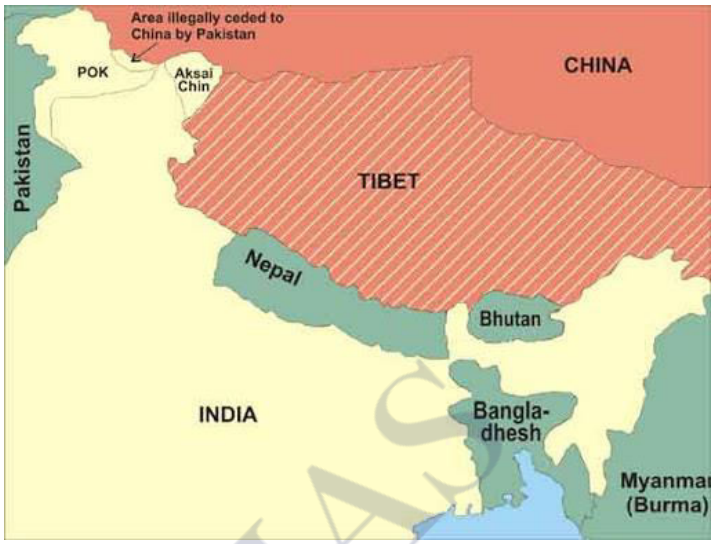
During a recent discussion with reporters in Dharamshala, the **Dalai Lama** reaffirmed his stance that **Tibetans seek greater autonomy within China,** emphasizing their desire for **self-governance** while remaining part of the People's Republic of China.

What is the China-Tibet Issue?

- **Tibet's Independence:**
  - Tibet is a region on the Tibetan Plateau in Asia, spanning about 2.4 million km2 – nearly a quarter of China's territory.
  - It is the traditional homeland of the Tibetan people as well as some other ethnic groups.
  - **Tibet is the highest region on Earth**, with an average elevation of 4,900 meters. The **highest elevation in Tibet is Mount Everest,** Earth's highest mountain, rising 8,848 m above sea level.
  - The **13th Dalai Lama, Thubten Gyatso**, announced de facto Tibetan independence in early 1913.

- **China did not recognize Tibet's independence and continued to claim sovereignty over the region.**

- **Chinese Invasion and Seventeen Point Agreement:**
  - From 1912 until the founding of the People's Republic of China in 1949, no Chinese government exercised control over what is today **China's Tibet Autonomous Region (TAR).**
  - The Dalai Lama's government alone ruled the land until 1951. **Tibet was not "Chinese" until Mao Zedong's People's Liberation Army (PLA)** marched in and Invaded Tibet.
  - In 1951 Tibetan leaders were forced to sign a treaty dictated by China. The treaty, known as the **"Seventeen Point Agreement"**, professes to guarantee Tibetan autonomy and to respect the Buddhist religion but also allows the establishment of Chinese civil and military headquarters at Lhasa (Tibet's capital).
    - However, the Tibetan people, including the Dalai Lama consider it invalid.
    - This has often been described by the **Tibetan people and third-party commentators as "a cultural genocide".**



- **1959 Tibetan Uprising:**
  - Escalating tensions between Tibet and China led to a critical turning point in 1959 when the Dalai Lama, along with a group of followers, fled to India, seeking asylum.
  - Tibetans who followed the Dalai Lama formed an exiled government based in Dharamshala, India, known as the **Central Tibetan Administration (CTA).**
- **Aftermath of the 1959 Tibetan Uprising:**
  - Since the 1959 Uprising, the central government of China has been steadily tightening its grip on Tibet.
  - In Tibet today, there is **no freedom of speech, religion, or press and arbitrary detainments continue.**
  - Forced abortion, sterilization of Tibetan women, and the transfer of low-income Chinese citizens threaten the survival of Tibetan culture.
  - Although China has invested in infrastructure improvements for the region, particularly in **Lhasa itself,** it has also encouraged thousands of ethnic Han Chinese to move to Tibet resulting in the demographic shift.

What is the Impact of Tibet and the Dalai Lama on India-China Relations?

- For centuries, Tibet was India's actual neighbour, as most of India's boundaries and the **3500km LAC (Line of Actual Control) are with the Tibetan Autonomous Region, and not the rest of China.**
- In 1914, it was Tibetan representatives, along with the Chinese that **signed the Simla convention with British India that delineated boundaries.**
- However, after **China's full accession of Tibet in 1950**, China repudiated the convention and the **McMahon line that divided the two countries.**
- Further, in 1954, India signed an agreement with China, agreeing to recognize Tibet as the **"Tibet region of China".**
- The presence of the **Dalai Lama in India** has been a persistent irritant in **India-China relations, as China considers him a separatist.**
- **The Tibetan plateau's significance in terms of water resources and geopolitical considerations adds complexity to the India-China-Tibet equation.**

What are the Recent Developments in Tibet?

- China has been building and developing next-generation **infrastructure in Tibet**, such as border defence villages, dams, an all-weather oil pipeline, and internet connectivity projects.
- China is trying to **control the selection of the next Dalai Lama**, by promoting that Tibetan Buddhism has always been part of Chinese culture.
- The Indian government **doesn't give citizenship to Tibetans born in India after the cut-off year of 1987.**
  - This has created a sense of dissatisfaction amongst the youth of the Tibetan community.

Dalai Lama

- **About:**
  - The Dalai Lama belongs to the **Gelugpa tradition of Tibetan Buddhism**, which is the **largest and most influential tradition in Tibet.**
  - There have been only **14 Dalai Lamas** in the history of Tibetan Buddhism, and the **first and second Dalai Lamas were given the title posthumously.**
    - **The 14th and current Dalai Lama is Tenzin Gyatso.**
  - The Dalai Lamas are believed to be manifestations of **Avalokiteshvara or Chenrezig, the Bodhisattva of Compassion and the patron saint of Tibet.**
    - Bodhisattvas are realized beings inspired by a wish to attain **Buddhahood for the benefit of all sentient beings,** who have vowed to be reborn in the world to help humanity.
- **Process to Choose Dalai Lama:**
  - The process to choose the Dalai Lama traditionally involves identifying the **reincarnation of the previous Dalai Lama**, who is considered the spiritual leader of Tibetan Buddhism.
  - The search for the Dalai Lama's reincarnation typically begins after the **previous Dalai Lama's passing.**
    - According to Buddhist scholars it is the responsibility of the High Lamas of the Gelugpa tradition and the Tibetan government to seek out and find the next Dalai Lama following the death of the incumbent.
  - **If more than one candidate is identified,** the true successor is found by officials and **monks drawing lots in a public ceremony.**
  - The **selected child, usually very young,** is then recognized as the reincarnation of the Dalai Lama and undergoes rigorous spiritual and educational training.
  - The Dalai Lama's role encompasses both **spiritual and political leadership** in Tibetan Buddhism, and the selection process plays a crucial role in Tibetan cultural and religious traditions.
  - This process can take several years: it took four years to find the 14th (current) Dalai Lama.
    - The search is generally limited to Tibet, although the current Dalai Lama has said that there is a chance that he will not be reborn and that if he is, it will not be in a country under Chinese rule.

6. Global Hunger Index 2023

Why in News?

In the **Global Hunger Index** 2023, India ranked **111th out of 125 countries,** indicating a serious level of hunger.

- Neighbouring countries, such as **Pakistan (102nd), Bangladesh (81st), Nepal (69th), and Sri Lanka (60th)**, scored better than India.

What is the Global Hunger Index?

- **About:**
  - The **Global Hunger Index (GHI)** is a peer-reviewed report, published on an annual basis by **Concern Worldwide and Welthungerhilfe.**
  - The GHI is a tool designed to comprehensively measure and track hunger at **global, regional, and national levels,** reflecting multiple dimensions of hunger over time.
    - The GHI score is calculated on a 100-point scale reflecting the severity of hunger - **0 is the best score (implies no hunger) and 100 is the worst.**

Note: Concern Worldwide is an **international humanitarian organization** dedicated to tackling poverty and suffering in the world's poorest countries.

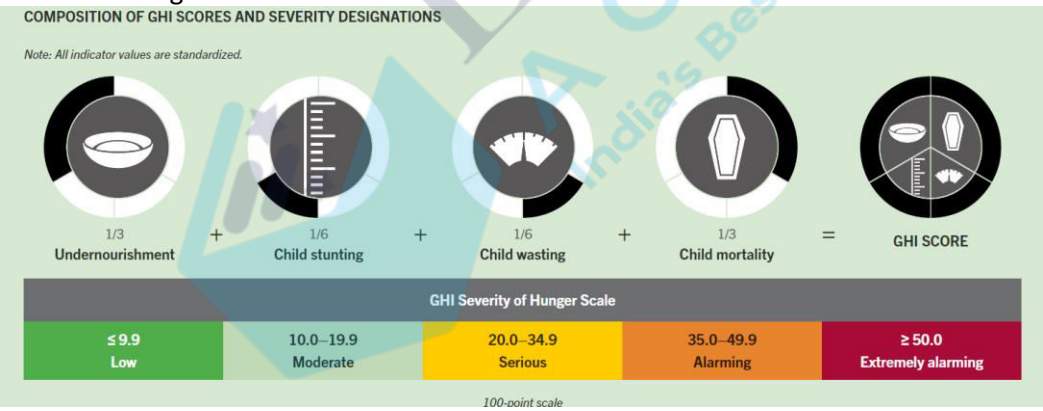
- Welthungerhilfe is a **private aid organization in Germany.** It was established in **1962,** as the German section of the **"Freedom from Hunger Campaign".**
- **Calculation:**
  - Each country's GHI score is calculated based on a formula that combines **four indicators** that together capture the **multidimensional nature of hunger:**
    - **Undernourishment:** The share of the population whose caloric intake is insufficient;
    - **Child Stunting:** The share of children under the age of five who have low height for their age, reflecting chronic under-nutrition;
    - **Child Wasting:** The share of children under the age of five who have low weight for their height, reflecting acute under-nutrition; and

- **Child Mortality:** The share of children who die before their fifth birthday, reflecting in part the fatal mix of inadequate nutrition and unhealthy environments.

- **Alignment with Sustainable Development Goals (SDG):**
  - The prevalence of undernourishment is an indicator of **SDG 2.1**, focusing on ensuring access to safe, nutritious, and sufficient food for all.
  - Child stunting and wasting rates are **indicators for SDG 2.2,** which aims to end all forms of malnutrition.
  - Reducing preventable child deaths is an **SDG 3.2 goal.**

What are the Key Takeaways from GHI 2023?

- **India's GHI Score:**
  - **Score Analysis:**
    - India's GHI score 2023 stands at **28.7**, categorized as **"serious" on the GHI Severity of Hunger Scale.**
    - This shows a slight improvement from its GHI 2015 score of **29.2,** which was also deemed serious.
    - Also, compared to its alarming GHI scores of 38.4 in 2000 and 35.5 in 2008, India has made significant progress.
  - **Related Data and References:**
    - Child stunting is prevalent at 35.5% (India's **National Family Health Survey(NFHS) 2019-2021**)
    - The prevalence of undernourishment in India is **16.6%** (State of Food Security and Nutrition in the World report 2023)
    - India's child wasting rate is a concerning **18.7%** (India's NFHS 2019-21), the highest among all countries in the report.
    - The under-five mortality rate stands at **3.1%** (United Nations Inter-Agency Group for Child Mortality Estimation January 2023)
- **Global Hunger Trends:**
  - According to the GHI 2023 report, **Belarus, Bosnia & Herzegovina, Chile, and China** are among the top-ranked countries (i.e., low level of hunger) and **Yemen, Madagascar, Central African Republic** are at the bottom.
  - The **GHI 2023 score for the world is 18.3**, considered **moderate**, showing minimal improvement since 2015.
    - The prevalence of **undernourishment** has risen from 572 million to approximately **735 million people since 2017.**
  - The GHI attributed the stagnation to various crises, including **climate change, conflicts, economic shocks, the COVID-19 pandemic, and the Russia-Ukraine war.**
    - These crises have exacerbated social and economic inequalities and hindered progress in reducing hunger worldwide.



What is the Indian Government's Response to GHI Report 2023?

- **Criticism of Methodology:** The **Ministry of Women and Child Development** has raised concerns about the report's methodology, suggesting **"serious methodological issues" and "malafide intent."**
  - Data from the government's Poshan Tracker consistently shows **child wasting prevalence below 7.2%**, which contradicts the GHI's reported figure of **18.7%.**
- **Focus on Child Health:** The government noted that **three out of the four GHI indicators pertain to children's health** and may not provide a complete representation of the entire population.
- **Small Sample Size:** The government expressed doubts about the accuracy of the **"Proportion of Undernourished Population"** indicator, as it is based on a **small sample size opinion poll.**

- **Complex Factors:** The government's argument is that indicators like **stunting and wasting are outcomes of various complex factors**, including **sanitation, genetics, environment**, and food utilization, and are not s**olely attributable to hunger.**
  - The government also pointed out that **child mortality may not solely be an outcome of hunger,** indicating that other factors are at play.

What are the Other Terms Related to Hunger?

Term	Definition
Undernourishment	▪ It refers to insufficient calorie intake to sustain a healthy life, as defined by the **Food and Agriculture Organization of the United Nations.** ▪ It is based on individual needs in terms of **age, sex, stature, and physical activity.**
Under-nutrition	▪ It extends beyond calories and encompasses deficiencies in **energy, protein, and essential vitamins and minerals.** ▪ Under-nutrition results from **inadequate food intake in terms of both quantity and quality**, poor nutrient utilization due to infections or illnesses, or a combination of these factors.
Famine	• It is a **distinct condition** defined by the UN as occurring when specific conditions are met: o when at least **20%** of the population faces severe food shortages, o acute child malnutrition rates exceed **30%,** o **Two out of 10,000 people** die from starvation or malnutrition-related diseases daily.

What are the Factors Responsible for Hunger in India?

- **Socioeconomic Disparities and Poverty:** Widespread **poverty** and socioeconomic disparities are fundamental determinants of hunger in India.
  - Poverty leads to inadequate **food consumption and the inability to afford** essential nutritional and healthcare services.
- **Hidden Hunger:** India is experiencing a **severe micronutrient deficiency (also known as hidden hunger).**
  - There are several causes of this problem, including poor diet, disease, and a **failure to meet micronutrient needs during pregnancy and lactation.**
- **Inefficient Agricultural Practices and Food Distribution:** Inefficiencies in agricultural practices, including **suboptimal crop yields and post-harvest losses,** also contribute to insufficient food availability.
  - Furthermore, subsequent leakages in **food distribution and supply chain management restrict the flow of food to vulnerable populations,** resulting in food scarcity and higher prices, which disproportionately affect the poor.
- **Gender Inequality and Nutritional Disparities:** Gender-based disparities exacerbate the problem of hunger and malnutrition in India.
  - Women and girls often experience **unequal access to food within households,** receiving smaller portions or lower-quality diets.
  - This inequity, **coupled with the demands of maternal and child care**, exposes them to higher nutritional risks, leading to chronic under-nutrition.
- **Climate Change and Environmental Stressors:** India is susceptible to **climate change-related environmental stressors,** such as **changing weather patterns, extreme weather events, and natural disasters.**
  - These factors can disrupt agricultural production, leading to crop failures and food scarcity.

- **Lack of Audit for Nutritional Programmes**: Although a number of programmes with improving nutrition as their main component are planned in the country, there is **minimal or no nutritional audit mechanism at the local governance level.**

What are the Indian Government Initiatives to Address Hunger?

- Eat Right India Movement,
- POSHAN Abhiyan(National Nutrition Mission),
- Mid-day Meal (MDM) scheme,
- Pradhan Mantri Matru Vandana Yojana,
- National Food Security Act, 2013,
- Mission Indradhanush,
- Integrated Child Development Services (ICDS) Scheme,
- PM Garib Kalyan Yojna.

Way Forward

- **Social Audit and Awareness:** Mandate social audits of the **mid-day meal scheme in all districts**, involving local authorities, alongside raising awareness on nutrition.
  - Utilize information technology for better program monitoring.
  - Establish **community-driven nutrition education programs** that raise awareness about balanced diets, food preparation, and the importance of nutrition in local languages, **particularly targeting women and children.**
- **PDS Enhancement:** Revamp the **Public Distribution System (PDS)** to enhance **transparency, reliability, and affordability** of nutritious food, benefiting the economically disadvantaged.
- **Reducing Food Waste, Reducing Hunger:** Address food wastage issues by **improving warehousing and cold storage facilities.**
  - According to the **International Institute of Refrigeration**, if developing countries had the same level of refrigeration infrastructure as developed countries, **they would save 200 million tonnes of food or around 14% of their food supply,** which can help in tackling hunger and malnutrition.
- **Mobile Nutritional Clinics:** Implement **mobile nutritional clinics that visit remote and underserved areas** to provide health assessments, dietary counselling, and supplementary feeding for children and pregnant women.

7. Granting Habitat Rights and Implications

Why in News?

Recently, the Chhattisgarh Government granted habitat rights to its **Baiga PVTG (Particularly Vulnerable Tribal Group)** right after the Kamar PVTG received habitat rights in August 2023.

- The Baiga PVTG became the second group to be granted these rights in Chhatisgarh.
- Chhattisgarh has **seven PVTGs** (Kamar, Baiga, Pahadi Korba, Abujhmadiya, Birhor, Pando and Bhujia).

What is the Baiga Tribe?

- The Baiga (means sorcerers) tribe mainly lives in Chhattisgarh, Jharkhand, Bihar, Odisha, West Bengal, Madhya Pradesh and Uttar Pradesh.
- Traditionally, the Baiga lived a semi-nomadic life and practised slash-and-burn cultivation. Now, they are mainly dependent on **minor forest produce** for their livelihood.
  - Bamboo is the primary resource.
- Tattooing is an integral part of Baiga culture, every age and body part has a specific tattoo reserved for the occasion.

What are Habitat Rights?

- **About:**
  - Habitat rights recognition provides the community concerned **rights over their customary territory of habitation,** socio-cultural practices, economic and livelihood means, intellectual knowledge of biodiversity

and ecology, traditional knowledge of the use of natural resources, as well as **protection and conservation of their natural and cultural heritage.**

- Habitat rights **safeguard and promote traditional livelihood** and ecological knowledge passed down through generations. They also help **converge different government schemes and initiatives from various departments** to empower PVTG communities to develop their habitats.
  - According to the FRA, "habitat" includes customary habitats and those in reserved and protected forests of PVTGs and other forest-dwelling Scheduled Tribes.
- Out of 75 PVTG in India, **only three have habitat rights- the Bharia PVTG in Madhya Pradesh was the first,** followed by the Kamar tribe and now the Baiga tribe in Chhattisgarh.

- **Procedure of Declaring Habitat:**
  - The procedure is based on a detailed guideline given for this purpose in 2014 by the Ministry of Tribal Affairs.
  - The process **involves consultation with traditional tribal leaders** to determine the extent of culture, traditions, and occupation.
  - Coordination between state-level departments, including Forest, Revenue, Tribal, and Panchayati Raj, and with the UNDP team is essential for defining and declaring habitats.
- **Legality:**
  - Habitat rights are granted to PVTGs under Section 3(1)(e) of the **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006** (also known as FRA).
  - The recognition of Habitat rights grants PVTGs possession over their customary territory, encompassing habitation, economic and livelihood means, and biodiversity knowledge.

Identification of PVTGs

- PVTGs are identified based on criteria such as **technological backwardness,** stagnant or declining population growth, **low literacy levels**, subsistence economy, and challenging living conditions.
- They face vulnerability in **health, education, nutrition, and livelihood.**
- The Ministry of Tribal Affairs has identified **75 PVGTs in 18 states and one Union Territory.**
- In 1973, the **Dhebar Commission created Primitive Tribal Groups (PTGs)** as a separate category, which are less developed among the tribal groups. In 2006, the Government of India renamed the PTGs as PVTGs.

What is the Significance of Granting Habitat Rights?

- **Preservation of Culture and Heritage:**
  - Granting tribal rights helps preserve the unique cultural, social, and traditional heritage of tribal communities. It allows them to **maintain their distinct languages, rituals, customs, and traditional knowledge systems.**
- **Empowerment and Social Justice:**
  - Tribal rights empower these communities by providing them with legal recognition, ensuring their participation in decision-making processes that affect their lives, and rectifying historical injustices. This empowerment contributes to a more just and equal society.
- **Protection of Livelihoods:**
  - Many tribal communities depend on their natural surroundings for their livelihoods. Granting rights over lands and resources ensures that **they can sustain their traditional occupations like hunting, gathering, fishing, and farming, supporting their economic well-being.**
- **Sustainable Development:**
  - By granting rights to tribal communities, governments can **promote sustainable development.** Indigenous practices often prioritize sustainability and conservation, which is crucial for the environment and the overall well-being of society.
- **Conservation of Biodiversity:**
  - Tribal communities often possess unique knowledge about their local ecosystems, flora, fauna, and sustainable resource management. Recognizing their rights **allows for the preservation of biodiversity and sustainable management of natural resources.**

Conclusion

Granting tribal rights is fundamental to fostering a more inclusive, just, and harmonious society where the rights, cultures, and traditions of all citizens, including tribal communities, are respected and protected.

8. SC to Hear Challenge on Designation of Bills as Money Bills

Why in News?

A seven-judge Bench of the **Supreme Court of India,** led by the **Chief Justice of India**, addresses a request for priority to a reference concerning the manner in which the Centre got crucial amendments passed in the Parliament as **Money Bills.**

What are the Challenged Amendments Passed as Money Bills?

- **Prevention of Money Laundering Act (PMLA) Amendments:**
  - Amendments made from 2015 onwards to the **Prevention of Money Laundering Act (PMLA)** granted the **Enforcement Directorate** extensive powers, including the authority to make arrests and conduct raids.
    - The primary concern is the passage of these **amendments as Money Bills**, raising questions about their legality and constitutionality.
    - Legal experts and petitioners question whether these significant changes should have followed the standard legislative process involving both houses of Parliament.
- **Finance Act of 2017:**
  - The **Finance Act of 2017** was categorized and passed as a Money Bill, raising concerns about the proper use of this legislative procedure.
  - Allegations that the Act aimed to alter appointments to 19 key judicial tribunals, including the **National Green Tribunal and Central Administrative Tribunal.**
    - Accusations that categorizing the 2017 Act as a Money Bill was a deliberate attempt to extend executive control over these tribunals.
  - The Act's passage was accompanied by changes that substantially downgraded the qualifications and experience required to staff these key judicial bodies.
- **Aadhaar Act, 2016**:
  - The Supreme Court in 2018, ruled in favour of the government and had cleared the **Aadhaar Act as a valid money bill under Article 110 of the Constitution.**
    - The government had argued that since the subsidies distributed through Aadhaar flow from the **Consolidated Fund of India**, the law is validly categorized as a Money Bill which raised legal and procedural questions.
    - Money Bills are **exclusive to the Lok Sabha and limit the Rajya Sabha's influence.**
  - Recently, the CJI, asked for a more comprehensive review.

What will be the Implications of the Larger Bench?

- Clarity on the constitutionality of the PMLA, Aadhaar Act, and Tribunal reforms.
  - Determination of whether these laws were rightly categorized as money bills or used to circumvent Rajya Sabha scrutiny.
- Resolution of whether these classifications were legally sound or strategic manoeuvres to avoid oversight.
- The discussions within the larger bench might offer additional insights into the level of scrutiny that the **judiciary can exercise over the Speaker's determinations in classifying bills as money bills.**

What is a Money Bill?

- **Definition:**
  - A Money Bill is a financial legislation that contains provisions exclusively related to revenue, taxation, government expenditures, and borrowing.
- **Constitutional Basis:**
  - **Article 110(1),** a Bill is deemed to be a money Bill if it deals only with matters specified in **Article 110 (1) (a) to (g) —** taxation, borrowing by the government, and appropriation of money from the **Consolidated Fund of India,** among others.
    - Article 110(1) (g) adds that **"any matter incidental to any of the matters specified in Articles 110(1)(a)-(f)" can also be a Money Bill.**
  - Article 110 (3) of the Constitution, "If any question arises whether a Bill is a Money Bill or not, the decision of the **Speaker of the House of the People thereon shall be final.**
- **Procedure:**
  - Money Bills must be introduced in the Lok Sabha and cannot be introduced in the Rajya Sabha (the upper house).

- The Rajya Sabha can only make recommendations on a Money Bill but does not have the power to amend or reject it.
- The President can either accept or reject a money bill but **cannot return it for reconsideration.**
- There is no **provision for Joint sitting.**

9. India's Balancing Act in the Israel-Palestine War

Why in News?

India's diplomatic stance on the **Israel-Palestine conflict** has evolved over the years, reflecting a delicate balance between its **historical support for Palestine and its growing relationship with Israel.**

How has been India's Policy over the Israel-Palestine Conflict?

- **Background:**
  - India's **historical stance on the Israel-Palestine conflict** leaned towards Palestine, driven by factors such as **Mahatma Gandhi's opposition to a Jewish state in Palestine**, India's large Muslim population, and the **need to maintain good relations with Arab countries.**
    - India's position with regard to Palestine was also guided by the general consensus in the Arab world, the Non-Aligned Movement, and the United Nations.
    - When the partition of Palestine plan was put to vote at the UN, **India voted against it, along with the Arab countries**. India also opposed Israel's admission to the UN.
  - During the **Cold War,** India aligned **itself with the Soviet Union,** which supported the Arab states, thus **perpetuating its pro-Palestine position.**
- **Shift in India's Policy:**
  - **Establishment of Diplomatic Relations:** In 1992, India established full **diplomatic relations with Israel**, marking a significant shift. Despite this, India continued to **voice support for the Palestinian cause.**
    - It was only after the end of the Cold War that Prime Minister Narasimha Rao took the bold step of **establishing diplomatic ties with Israel, irrespective of potential fallout** with the Arab nations.
  - **Balance in National Interest:** India's diplomatic decisions are guided by **national interest**, necessitating a balance between maintaining strong relations with Israel, supporting Palestine, and **developing ties with the Arab world.**

What are the Current Policy and Diplomatic Nuances?

- **Relations with Israel as a National Interest:**
  - India's relations with Israel have strengthened considerably in recent years, encompassing **various sectors like trade, technology, defence,** and counter-terrorism cooperation.
  - India's support for Israel is seen as a response to its **fight against cross-border terrorism,** although the situations in Israel and India differ significantly.

- **Stands With Palestine's Cause:**
  - Besides growing relations with Israel, India has reiterated its stand for Palestine's cause.
    - Amid the ongoing tensions, USD 29.53 million has been contributed by India to the **UN Relief and Works Agency (UNRWA)** for Palestinian refugees.
  - India also sent nearly 6.5 tonnes of medical aid and 32 tonnes of disaster relief material for the **people of Palestine.**
- **India Balancing its Stance:**
  - In 2017, the Indian Prime Minister for the first time visited Israel and in 2018 he made an official visit to Palestine for the first time.
  - In 2017, India voted **against the U.S. and Israel for an attempt to declare unilaterally all** of Jerusalem as the Israeli capital.
  - India's policy is clear, they condemn **terrorism but do not support indiscriminate reprisal bombings.**
- **India's Official Stand:**
  - India's official position on the Israel-Palestine conflict remains unchanged, advocating for a **two-state solution with Israel and Palestine** as good neighbours.
    - It was only after the mediation of the US, in the **1991 Madrid Peace conference** a two-state solution was agreed to **resolve the Israeli-Palestinian conflict.**
  - This is evidenced by the Indian Prime Minister's visit to **Ramallah in the West Bank in 2018.**

What will be the Likely Implications of Israel Palestine Conflict on India?

- **Defence Deals with Israel:**
  - India has a significant defence relationship with Israel, with defence procurement and technology cooperation. The conflict may **impact this relationship, as Israel may focus more on its security needs** during the conflict.
  - Israel supplies the most military equipment to India, with the military business between the two countries worth around USD 2.1 billion.
- **Energy Security:**
  - India is **dependent on oil imports from the Middle East,** and any escalation in the region could affect energy prices and, subsequently, India's economy.
  - Since all the world economies are interconnected, if countries like Saudi Arabia and Iran get involved in the ongoing Israel-Palestine conflict then definitely there will be **direct consequences for India's energy supply,** economy and investment.
- **Impact on India-Middle East-Europe Economic Corridor:**
  - The conflict has the potential to affect the stability of the Middle East, a region of strategic importance to India.
  - An escalation of hostilities could have implications for India's interests and engagements in the region.
    - India recently signed the **India-Middle East-Europe Economic Corridor (IMEC)** as an ambitious infrastructure project aimed at connecting India, the Middle East, and Europe through various transportation modes, including shipping and rail networks.
    - Instability in the region can create security challenges, and affect the smooth operation of the IMEC.

Way Forward

- Maintaining a status quo in the Israel-Palestine conflict is a challenging endeavour, and India can play a **constructive role by promoting a peaceful resolution** based on a two-nation theory.
- India should continue its diplomatic efforts and use its international influence to encourage both **Israel and Palestine to return to the negotiating table.**
- India must continue to act as a mediator and provide humanitarian assistance to the Palestinian people to address their immediate needs and alleviate suffering in conflict-affected areas.
- Encourage dialogues and exchanges between Israeli and Palestinian civil society groups, academics, and youth to promote mutual understanding and trust.

10. Questioning in Parliament

Why in News?

Recently, one of the **Members of Parliament (MPs)** has been questioned by the **Central Bureau of Investigation (CBI)** and the **Lok Sabha Ethics Committee**, in her alleged involvement in 'cash for query' allegations.

- The member had allowed an individual to use her parliamentary login and password to **post questions on her behalf** in the Lok Sabha with the intention of furthering a particular agenda or receiving compensation for doing so.
- These allegations raised concerns about the ethical conduct of parliamentarians and the potential misuse of their positions for personal gain.

What is the Procedure for Raising Questions in Parliament?

- **Procedure:**
  - **Rules of Procedure and Conduct of Business in Lok Sabha:** The procedure for raising questions is governed by **Rules 32 to 54 of the "Rules of Procedure and Conduct of Business in Lok Sabha"** and Directions 10 to 18 of the "Directions by the Speaker, Lok Sabha".
    - To ask a question, an MP has to first **give a notice addressed to the lower house's Secretary-General,** intimating their intention to ask a question.
    - The notice usually contains the text of the question, the official designation of the Minister to whom the question is addressed, the date on which the answer is desired, and the order of preference, in case the MP tables more than one notice of questions for the same day.
    - MPs can **submit up to five notices of questions (both oral and written) for a single day**. Notices exceeding this limit are considered for subsequent days within the same session.
  - **Notice Period:** Typically, the notice period for a question is **not less than 15 days.**
    - MPs can submit their notices either through an online 'Member's Portal' or by using printed forms from the Parliamentary Notice Office.
    - The Speaker of Lok Sabha reviews the notices and determines their admissibility based on established rules.
- **Conditions for Question Admissibility:**
  - Questions must not **exceed 150 words** and should avoid containing arguments, defamatory statements, or references to personal conduct, except in an official or public capacity.
  - Questions that pertain to broad policy issues are not admissible due to the impracticality of addressing complex policies within a brief answer.
  - Questions cannot concern matters under judicial consideration or before parliamentary committees. They should also **avoid seeking information that could undermine national unity and integrity.**

Note

In Rajya Sabha, the admissibility of questions is governed by **Rules 47-50 of the Rules of Procedure and Conduct of Business** in the Council of States. Among various norms, the question **"shall be pointed, specific and confined to one issue only".**

What are the Categories of Questions?

- **Starred Question:**
  - A starred **question is asked by an MP and answered orally** by the Minister-in-charge. Each MP is allowed to **ask one starred question** per day. When a question is answered orally, **supplementary questions can be asked thereon.**
- **UnStarred Question:**
  - The MP seeks a **written answer,** which is deemed to be laid on the table of the House by the concerned minister and **supplementary questions cannot be followed.**
- **Short Notice Question:**
  - These are urgent matters of public importance, and an **oral answer is sought.** For asking such a question, a notice of less than 10 days is prescribed as the minimum period.
- **Question to Private Member:**
  - A question can be addressed to a private member under Rule 40 of Lok Sabha's Rules of Procedure, or under Rule 48 of Rajya Sabha's Rules, provided that the question deals with a subject relating to some Bill, resolution or other matter for which that member is responsible.

What is the Significance of Raising Questions?

- **Parliamentary Right:**
  - Asking questions is an inherent and **unrestricted parliamentary right of MPs,** serving as a tool for legislative control over executive actions.
- **Functions of Questioning:**

- This exercise allows MPs to **acquire information on government activities,** critique policies, highlight government shortcomings, and prompt ministers to take steps for the common good.

- **Government's Perspective:**
  - For the government, questions provide insight into public sentiment regarding policies and administration. They can lead to the formation of parliamentary commissions, inquiries, or the enactment of legislation.

Way Forward

- Under Article 75 of the constitution, asking questions in parliament is a constitutional right of a member of the House. Viewed from this angle, the Question Hour in parliament stands on a different footing.
- In a way, every Question Hour is the manifestation of a direct kind of democracy in operation, in the sense that representation of the people directly questions the government on matters of governance, and the government is duty-bound to answer the questions in the House.
- The concerned officials also should give a good reason why a question should be disallowed. The reason also cannot be accessed through **RTIs (Right to Information) due to the privilege of the House** — tough to take it to court as well.

11. Former Navy Personnel Sentenced to Death in Qatar

Why in News?

Recently, a Qatari court has sentenced eight former personnel of the **Indian Navy** to death in the Espionage Charges.

- The individuals were arrested in August 2022 and faced **charges related to breaching sensitive secrets.**

What is the Background of the Case?

- **Accusations:**
  - The accused individuals, while employed by **Al Dahra in Doha,** were allegedly accused of breaching sensitive secrets at the time of their arrest in 2022 in **Qatar.**
  - Dahra Global Technologies and Consultant Services, the company they worked for, was also linked to the production of **advanced Italian-origin submarines known for their stealth capabilities.**
  - However the specific charges against the eight Indian nationals have not been made public by **Qatari authorities.**

- **Previous Trials:**
  - The case has seen two trials in March and June of 2023. While the detainees were granted consular access on multiple occasions, both Indian and Qatari authorities **have maintained a veil of secrecy around the case**, citing its sensitivity.
- **India's Reaction:**
  - India has expressed deep shock and concern over the death sentences imposed on its citizens and is exploring all possible legal options to secure their release.
  - The **Ministry of External Affairs (MEA)** has conveyed the high importance attached to this case and **reiterated its commitment to providing consular and legal assistance** to the detained individuals.

What are the Diplomatic Implications of this Case?

- The verdict could potentially strain relations between India and Qatar, where a significant number of **Indian migrants contribute to fostering economic and diplomatic ties.**

- With over seven lakh Indians in Qatar, the Indian government is under pressure to act at the **highest level to save the lives of the detainees.**
  - They are making their contribution in different sectors. Indians are highly respected in Qatar for their sincerity, hard work, technical expertise and law-abiding nature.
  - The remittances which the Indian expatriate community in Qatar send to India are estimated to be around 750 million dollars per annum.
- This case represents the **first major crisis in the India-Qatar relationship,** which has generally been stable.
  - The two nations have engaged in high-level meetings, with the Prime Minister of India visiting Doha in 2016, followed by **meetings with the Emir of Qatar.**
- Qatar is a significant supplier of liquefied natural gas (LNG) to India, **accounting for a substantial portion of India's LNG imports.**

What are the Options India has to prevent these Navy Personnel?

- **Diplomatic Options:**
  - India can engage in direct diplomatic negotiations with the Qatari government to seek a resolution to the case. Given the strategic and economic importance of the relationship between the two **countries, diplomatic leverage can play a significant role.**
  - The government can also use diplomatic pressure to prevent meting out the death penalty.
  - Among the possibilities being looked at is filing an appeal against the verdict or using an **agreement signed by India and Qatar in 2015 for the transfer of convicted prisoners** so that they can **complete their sentence in their home country.**
  - NGOs and civil society can raise the **issue at a global level, and pressure from the United Nations** can be taken too.
- **Legal Options:**
  - The first step is to **appeal within the judicial system in Qatar**. The individuals sentenced to death can file appeals within the Qatari legal system.
    - India can provide **legal representation to the detainees and ensure that their right to appeal** is pursued vigorously.
  - If due procedures are not followed or an appeal process is missing, then India can **invoke International Court of Justice (ICJ) jurisdiction.**
    - ICJ acts as a world court **with twofold jurisdiction i.e.** legal disputes between States submitted to it by them (contentious cases) and requests for advisory opinions on legal questions referred to it by United Nations organs and specialized agencies (advisory proceedings).

In What Cases Was India Involved with the ICJ?

- Kulbhushan Jadhav Case (India Vs Pakistan).
- Right of Passage over Indian Territory (Portugal v. India, culminated 1960).
- Appeal relating to the Jurisdiction of the ICAO Council (India v. Pakistan, culminated 1972).
- Trial of Pakistani Prisoners of War (Pakistan v. India, culminated 1973).
- Aerial Incident of 10 August 1999 (Pakistan v. India, culminated 2000).
- Obligations concerning Negotiations relating to the Cessation of the Nuclear Arms Race and to Nuclear Disarmament (Marshall Islands v. India, culminated 2016).

Way Forward

- The way forward is likely to be challenging and may require time and persistence. It's essential for India to remain committed to the **well-being and legal rights of its citizens while navigating the complexities of international diplomacy** and the legal process in Qatar.
- Successful resolution may require a combination of **diplomatic efforts, legal actions, and international cooperation.**

GS Paper – 3

1. Nobel Prize in Chemistry 2023

Why in News?

The **Royal Swedish Academy of Sciences** awarded the **Nobel Prize in Chemistry 2023** to **Moungi G Bawendi, Louis E Brus, and Alexei I Ekimov** for their ground-breaking discovery and synthesis of **quantum dots**.

How did Scientists Discover Quantum Dots?

- **Background:**
  - Traditionally, **all pieces of a pure element**, regardless of size, were believed to have **identical properties** due to the uniform distribution of electrons.
    - However, about forty years ago, scientists discovered that nanoparticles on the nanoscale, **typically 1 to 100 billionths of a meter in size,** exhibited distinct behaviours different from their larger counterparts of the same element, **challenging this conventional belief.**
- **The Nobel Laureates' Contributions:**
  - **Alexei Ekimov:** In around 1980, Alexei Ekimov was the first to observe the **anomalous behaviour in Copper Chloride nanoparticles.**
    - He successfully manufactured these nanoparticles, **showcasing their distinctive properties.**
  - **Louis Brus:** American scientist Louis Brus made a similar discovery involving **Cadmium Sulphide** nanoparticles.
    - Like Ekimov, he could create these **nanoparticles with altered properties.**
  - **Moungi Bawendi:** Moungi Bawendi, who initially collaborated with Louis Brus, later played a pivotal role in **simplifying the production methods for nanoparticles with unique characteristics.**
    - His work paved the way for efficient and controlled manufacturing of nanoparticles displaying desired deviant behaviours.

Factor Responsible for Distinctive Properties of Nanoparticles:

- The unconventional behaviour of small nanoparticles is a result of the **emergence of quantum effects.**
- Despite nanoparticles being considerably larger than individual atoms, a crucial insight emerged in the 1930s, that **when particles are reduced to the nanoscale, quantum effects can come into play.**
  - This is primarily because, under such conditions, **electrons within atoms find themselves confined within a limited space.**
  - Typically, electrons move within a relatively spacious area outside the nucleus of an atom.
  - However, as particle size drastically decreases, **electrons experience increasing constraints,** leading to the manifestation of these peculiar quantum effects.
- This profound understanding, as **observed and demonstrated by the Nobel Laureates, Ekimov and Brus in their laboratories,** resulted in the creation of nanosized particles with distinct behaviours compared to their larger counterparts of the same element.
  - These remarkable nanoparticles, possessing unique properties, came to be known as **quantum dots.**
- **Feature of Quantum Dots:** Quantum dots are **nanoscale particles,** typically ranging in size from **1 to 100 nanometers**. These minuscule structures possess unique properties that are **governed by their size.**
  - Notably, the size of quantum dots determines the **colour of light they emit,** with smaller dots emitting blue light and larger ones shining in **yellow and red.**

Note

- **Quantum Effect:** Quantum refers to the fundamental behaviour of matter and energy at the smallest scales, where **classical physics no longer applies.**
  - Quantum effects are the phenomena that occur at the quantum level, where particles like electrons exhibit **behaviours such as superposition and entanglement,** which are distinct from classical physics.
- **Quantum Technology: Quantum technology** harnesses the unique properties of quantum mechanics to create innovative tools and applications, including quantum **computing, quantum cryptography, and quantum sensors,** with the potential to revolutionize various fields.

What can be the Applications of Quantum Dots?

- **Display Technology**: Quantum dots can enhance the quality of displays, such as **LED lamps and television screens,** by emitting clear and vibrant light.

- **Medical Imaging: They can illuminate tumour tissue during surgery,** aiding surgeons in precise removal.
  - Their nanoscale size makes them ideal for use in **tiny sensors.**
- **Flexible Electronics:** Quantum dots hold promise for **flexible electronics,** paving the way for innovative and adaptable devices.
- **Slimmer Solar Cells:** Quantum dots could lead to more **efficient and compact solar cells**, improving renewable energy solutions.
- **Encrypted Quantum Communication:** Quantum dots might play a role in developing **secure quantum communication technologies,** protecting sensitive information.

Who are the Other Recent Nobel Laureates in the Field of Chemistry?

- **2022**
  - **Carolyn R. Bertozzi, Morten Meldal and K. Barry Sharpless** "for the development of **click chemistry** and **bio-orthogonal chemistry"**
- **2021**
  - **Benjamin List and David MacMillan** "for the development of **asymmetric organocatalysis"**
- **2020**
  - **Emmanuelle Charpentier and Jennifer A. Doudna** "for the development of a method for **genome editing"**
- **2019**
  - **John B. Goodenough, M. Stanley Whittingham and Akira Yoshino** "for the development of **lithium-ion batteries"**
- **2018**
  - **Frances H. Arnold** "for the directed **evolution of enzymes"**
  - **George P. Smith and Sir Gregory P. Winter** "for the phage display of **peptides and antibodies".**

2. Coral Reef Breakthrough

Why in News?

The **International Coral Reef Initiative (ICRI)**, has launched the **Coral Reef Breakthrough** in partnership with the **Global Fund for Coral Reefs (GFCR)** and the **High-Level Climate Champions (HLCC).**

- The Initiative was launched at the **37th ICRI General Meeting, 2023.**

What is the Coral Reef Breakthrough?

- The Coral Reef Breakthrough is a science-based initiative with clear goals for the state and non-state actors to collectively conserve, protect, and restore **coral reefs**, safeguarding their vital contributions to humanity's future.
- The Coral Reef Breakthrough aims to secure the future of at least **125,000 km^2** of **shallow-water tropical coral reefs** with investments of **at least USD 12 billion** to support the resilience of more than half a billion people globally **by 2030.**
- The initiative is based on **four action points:**
  - **Action point 1:**
    - Mitigate **local drivers of loss** including land-based sources of pollution, destructive coastal development, and overfishing.
  - **Action point 2:**
    - **Double the area of coral reefs under effective protection:** Bolster resilience-based coral reef conservation efforts by aligning with and transcending global coastal protection targets including **30by30.**
    - 30 by 30 is a global initiative to **protect at least 30% of the Earth's land and ocean area by 2030**. It was proposed during the **UNCCD Conference of Parties (COP15).**
  - **Action point 3:**
    - Assist the development and implementation of innovative solutions at scale and climate-smart designs that support coral adaptation to impact 30% of degraded reefs by **2030.**
  - **Action point 4:**
    - Secure investments of at least USD 12 billion by 2030 from public and private sources to conserve and restore these crucial ecosystems.
    - Meeting the targets of the Coral Breakthrough will be instrumental in achieving the **Sustainable Development Goals (SDGs)**, particularly **SDG14, Life Below Water.**

International Coral Reef Initiative (ICRI)

- It is a global partnership between Nations and organizations that strives to preserve coral reefs and related ecosystems around the world.
- The Initiative was founded in **1994 by eight governments: Australia, France, Japan, Jamaica, the Philippines, Sweden, the United Kingdom, and the United States of America.**
  - It was announced at the **First Conference of the Parties of the Convention on Biological Diversity, 1994.**
- ICRI has **101 members, including 45 countries (India is one of them).**

High-Level Climate Champions (HLCC)

- They are appointed by the **United Nations** to facilitate and enhance the engagement of non-state actors such as businesses, cities, regions, and investors in supporting the goals of the **Paris Agreement on climate change.**

Global Fund for Coral Reefs (GFCR)

- The GFCR is a blended finance instrument to mobilise action and resources to protect and restore coral reef ecosystems.
  - It provides grant funding and private capital to support sustainable interventions to save coral reefs and the communities that rely on them.
- UN Agencies, nations, philanthropies, private investors and organisations have joined the Global Fund for Coral Reefs Coalition to deliver on ecological, social and economic resilience.

3. Stratospheric Aerosol Intervention Impact on Global Food Production

Why in News?

A recent study published in the journal ***Nature Food*** highlights the potential consequences of a **geoengineering technique**, **stratospheric aerosol intervention (SAI)**, on **global food production.**

What are the Key Highlights of the Study?

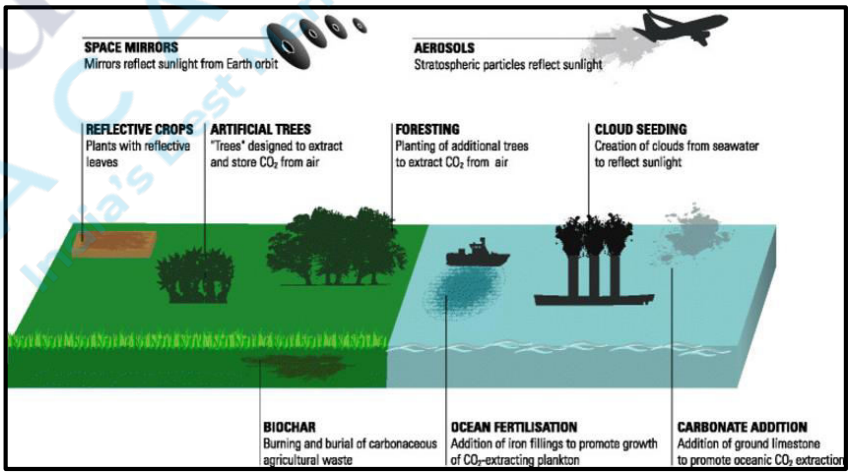
- **SAI as a Climate Intervention:**
  - SAI is considered a Plan B for addressing **climate change** if traditional mitigation strategies fail.
  - SAI mimics volcanic eruptions by injecting **sulphur dioxide into the stratosphere** (layer of atmosphere extending from about 10 kilometres to 50 km in altitude), where it oxidises to **form sulphuric acid,** which then forms reflective **aerosol particles.**
    - For example, **Mount Pinatubo in the Philippines** erupted in 2001 and injected about **15 million tonnes of sulphur dioxide** into the stratosphere, which then formed aerosol particles.
    - According to the **National Aeronautics and Space Administration (NASA)**, it caused a drop in the **average global temperature of about 0.6 degrees Celsius over the next 15 months.**
- **Diverse Impact on Agriculture:**
  - Reduction in temperature due to SAI affects agriculture differently based on factors like **precipitation** and **solar radiation.**
    - Understanding the ideal global temperatures for crop production is crucial for informed decision-making.
  - Researchers employ computer models to evaluate the effects of SAI scenarios on crops like **maize, rice, soybean, and spring wheat.**
  - Under **uncontrolled climate change**, crop production thrives in cold, high-latitude areas like Canada and Russia.
  - **Moderate SAI levels** could enhance food productivity in mid-latitude temperate regions like **North America and Eurasia.**
  - Under large amounts of climate intervention, agricultural production in the tropics could see an increase.
    - These regions include Mexico, Central America, the Caribbean and the top half of South America, most of Africa, parts of the Middle East, most of India, all of Southeast Asia, most of Australia and most of the island nations of Oceania.
  - Different nations may opt for varying SAI levels to maximize crop production, considering their geographical location and climate conditions.
- **Comprehensive Impact Assessment:**
  - Beyond crop production, the study underscores the need to explore other consequences, such as effects on human health and ecosystems.

What is Stratospheric Aerosol Intervention (SAI)?

- SAI is a proposed method of solar geoengineering (or solar radiation modification) to reduce **global warming.**
  - This would introduce aerosols into the stratosphere to create a cooling effect via global dimming and increased **albedo,** which occurs naturally from volcanic winter.
- However, some of the possible disadvantages of SAI are that it could have unintended consequences for the environment and human society, such as affecting the ozone layer, the hydrological cycle, the monsoon systems, and crop yields.

What is the Geo-engineering Technique?

- **About:**
  - It is a term that refers to the deliberate large-scale intervention in the Earth's climate system to combat climate change.
  - These interventions generally fall into two categories: **Carbon Dioxide Removal (CDR) and Solar Radiation Management (SRM).**
- **Carbon Dioxide Removal (CDR):**
  - These techniques aim to remove excess carbon dioxide from the atmosphere, thereby reducing the greenhouse effect.
  - **Examples of CDR Techniques:**
    - **Afforestation and Reforestation:**
      - Planting trees or restoring forests to increase the natural absorption of carbon dioxide by plants.
    - **Biochar:**
      - Converting **biomass** into **charcoal** and burying it in the soil to enhance its carbon storage capacity.
    - **Bioenergy with Carbon Capture and Storage (BECCS):**
      - Growing crops for **biofuel production** and capturing the carbon dioxide emitted during combustion and storing it underground or in the ocean.
    - **Ocean Fertilization:**
      - Adding nutrients such as iron or **nitrogen to the ocean to stimulate the growth of phytoplankton** that consume carbon dioxide and transfer it to the deep ocean.
- **Solar Radiation Management (SRM):**
  - These techniques aim to reduce the amount of solar energy that reaches the Earth's surface, thereby cooling the planet.
  - **Examples of SRM Techniques:**
    - **Stratospheric Aerosol Intervention (SAI).**
    - **Space-Based Reflectors (SBR):**
      - Placing mirrors or other devices in orbit around the Earth to deflect or block some of the incoming sunlight.
    - **Marine Cloud Brightening (MCB):**
      - Spraying seawater droplets or other substances into low-level clouds over the ocean to increase their reflectivity and albedo.



    - **Cirrus Cloud Thinning (CCT):**
      - Reducing the formation or persistence of high-level cirrus clouds that trap heat by cloud seeding them with ice crystals or other agents.
    - **Surface Albedo Modification (SAM):**
      - Changing the reflectivity of the land or sea surface by painting roofs white, covering deserts with reflective sheets, or increasing the ice cover.

4. Large Ozone Hole Detected Over Antarctica

Why in News?

Satellite measurements over **Antarctica** have revealed a massive **ozone hole**, or **"ozone-depleted area,"** stirring concerns. The **European Space Agency's Copernicus Sentinel-5P satellite** captured this significant anomaly.

- While it is not likely to **exacerbate warming on the surface of Antarctica,** this phenomenon raises questions about its **causes and potential ties to climate change.**

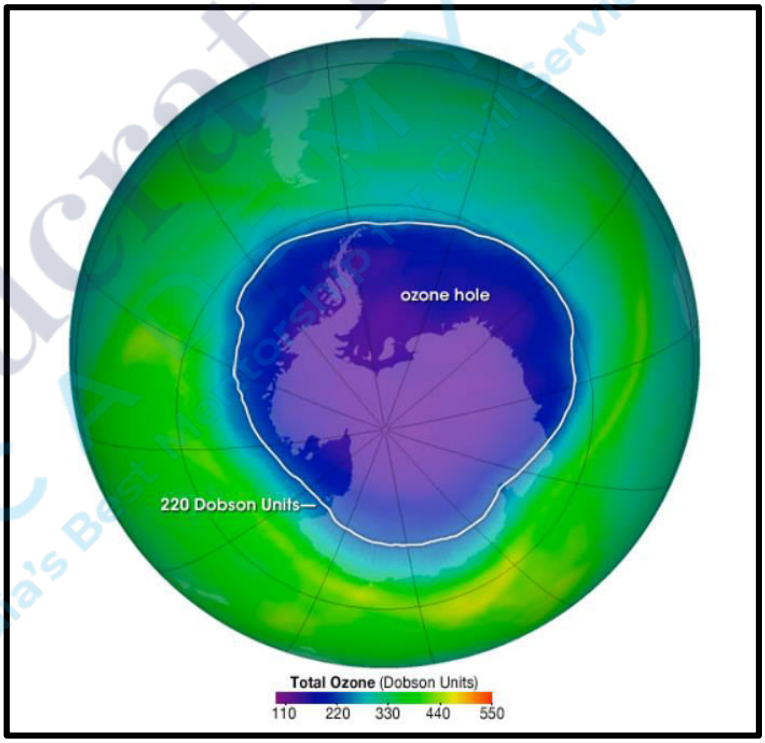
What is the Ozone Layer?

- The ozone layer, **found in the stratosphere (good ozone),** acts as a protective gas shield that **absorbs harmful ultraviolet (UV) radiation**, safeguarding us from the adverse effects of excessive UV exposure.
- **Skin cancer rates** are significantly influenced by UV radiation, underscoring the importance of preserving the ozone layer.

What is an Ozone Hole?

- **About:**
  - An ozone hole is a **region of the stratosphere over Antarctica** where the **ozone layer is exceptionally depleted.**
    - The ozone hole is **not technically a "hole" where no ozone is present.** Scientists use the word hole as a metaphor for the area in which ozone concentrations drop below the **historical threshold of 220 Dobson Units.**
  - The size of the **ozone hole over Antarctica varies from year to year,** typically **opening in August and closing by November or December.**
    - This annual fluctuation is driven by unique climatic conditions over the region.

- **Mechanism Behind Ozone Hole:**
  - The opening of the **ozone hole is a result of the Earth's rotation,** which generates specific winds over the enclosed landmass of Antarctica.
    - The **polar vortex, a band of strong winds around the poles,** plays a vital role in ozone-hole dynamics.
  - During winter, a polar vortex forms due to temperature differences and acts as a **protective barrier,** keeping **polar air separate from warmer,** lower-latitude air.
    - This isolation creates a cold environment for **polar stratospheric clouds (PSCs), which trigger ozone-depleting reactions.**
    - The chemical reactions that occur on the surface of PSCs are responsible for the activation of chlorine and bromine compounds. These compounds, particularly chlorine, are **catalysts in ozone-depleting reactions.** When exposed to sunlight, they trigger the breakdown of ozone molecules.



  - The **size and strength of the polar vortex directly impact ozone depletion.** When it weakens in spring, mixing with warmer air from lower latitudes **gradually closes the ozone hole,** replenishing the ozone layer.
- **Cause of the Ozone Hole in 2023:**
  - Scientists suspect that the substantial ozone hole observed in 2023 may be attributed to **volcanic eruptions in Tonga** during **December 2022 and January 2023.**
  - Unlike conventional volcanic eruptions, which generally release gasses confined to the lower atmosphere, this **eruption propelled a significant amount of water vapour into the stratosphere.**
    - This water vapour, in addition to other ozone-depleting elements like **bromine and iodine,** impacted the ozone layer through chemical reactions, altering its heating rate.

Note

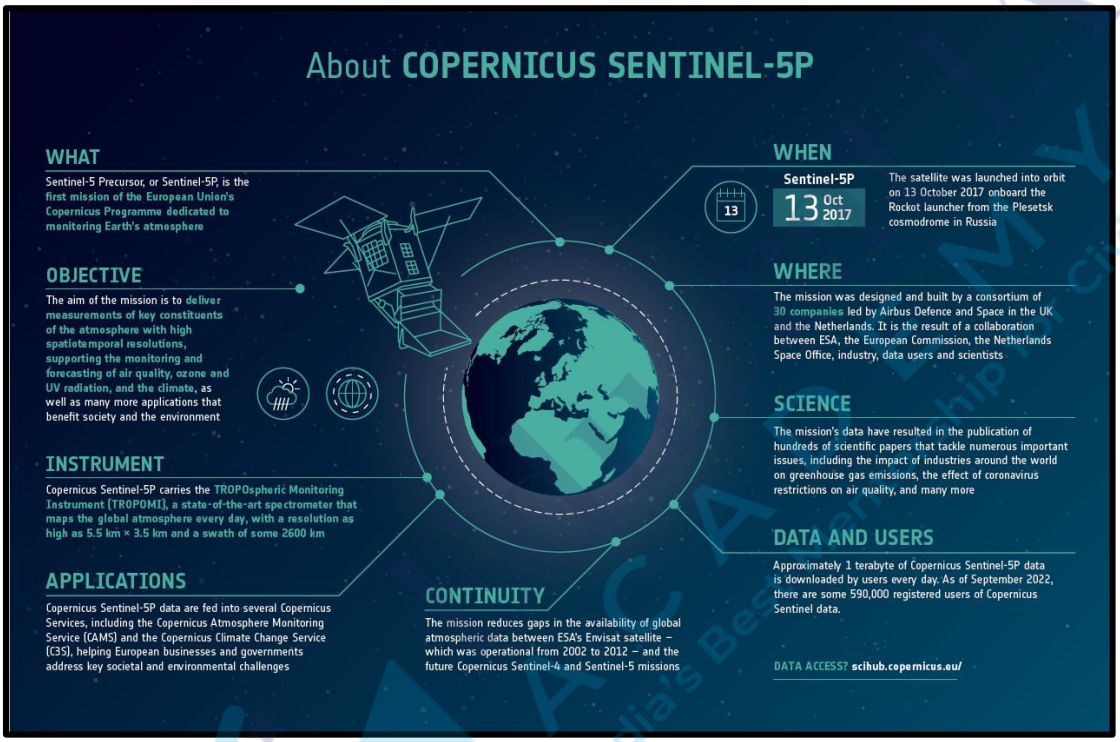
- While the Antarctic ozone hole in 2023 is likely linked to a natural event, it's essential to acknowledge that in the **1970s**, human activities, specifically the widespread use of **chemicals called chlorofluorocarbons (CFCs)**, were responsible for significant ozone depletion.
  - The use of these gasses as **propellants in aerosol cans** released chlorine into the stratosphere, contributing to ozone depletion.

- **Ozone Holes and Climate Change:**
  - Ozone depletion is not considered a **primary driver of global climate change.** However, there are indications that rising global temperatures may influence the behaviour of ozone holes.
  - Recent instances of significant ozone holes have been linked to climate change, particularly the **occurrence of wildfires.**
  - The increased frequency and intensity of wildfires, **often fuelled by climate change**, inject more **smoke into the stratosphere**, potentially contributing to further ozone depletion.
  - While ozone holes may have a **cooling effect**, reducing the **greenhouse gas effect,** (the loss of ozone means slightly more heat can escape into space from that region), they can also **alter the progression of seasons,** leading to **prolonged wintertime conditions.**

Note

- In response to the ozone depletion crisis, the international community recognized the need for action, leading to the **Vienna Convention in 1985** and the subsequent **Montreal Protocol in 1987.**
  - **World Ozone Day (16th of September)** is observed every year to commemorate the signing of the Montreal Protocol.

What is Copernicus Sentinel 5P Satellite?



5. Consanguinity

Why in News?

Recent studies delve into the **influence of consanguinity** on **genetics** and health. It elucidates how this widespread tradition affects **disease susceptibility and the development of human traits within global populations.**

What is Consanguinity?

- **Consanguinity** involves both **social and genetic dimensions**. Socially, it means marrying blood relatives, such as **cousins or siblings**, while genetically, it refers to unions between closely related individuals, often termed **inbreeding.**
  - It is a construct that has implications for both **family and population genetics.**

What are the Key Takeaways from the Studies Related to Consanguinity?

- Approximately **15-20% of the world's population practices consanguinity,** with higher prevalence in regions like **Asia and West Africa.**
  - Some ancient human civilizations, including the **Egyptians and Incas,** are believed to have practised consanguinity.

- Genetic evidence suggests that **King Tutankhamun of Egypt** was born to parents who were blood relatives.
- India has more than **4,000 endogamous groups** where people marry within the same caste/tribe or group, making it a fertile ground for consanguinity studies.
- It was found that consanguinity has **increased mortality rates** and the prevalence of **recessive genetic diseases** in populations where it is practised.

What are the Benefits and Challenges Related to Consanguinity?

- **Benefits:**
  - **Preservation of Cultural and Social Traditions:** In some societies, marrying within the family is a **long-standing tradition that helps preserve cultural and social norms.**
  - **Social Safety Net:** Consanguineous relationships can provide a **built-in social safety net.**
    - Relatives are more likely to assist each other during times of **financial, emotional, or medical crises**, reducing the burden on external social services.
  - **Reduced Risk of Incompatibility:** In some cases, marrying a close relative may reduce the **risk of incompatibility in terms of cultural, religious, or social backgrounds.** This can lead to more stable marriages.
  - **Genetic Improvement in Animal and Plant Breeding Programs:** In controlled breeding settings, mating closely related individuals is a widely used technique to **strategically eliminate harmful genetic traits** and enhance desirable qualities in plants and animals.
    - Through selective breeding, scientists can develop stronger and more productive strains, **leading to better agricultural yields and improved livestock quality.**

- **Challenges of Consanguinity:**
  - **Increased Risk of Genetic Disorders:** The most significant challenge of consanguinity is the **increased risk of offspring inheriting genetic disorders** due to the sharing of common recessive genes.
    - Conditions such as cystic fibrosis disability are more prevalent among offspring of close relatives.
  - **Limited Genetic Diversity:** Marrying close relatives can lead to **limited genetic diversity** in the population, potentially reducing the overall resilience to diseases and environmental changes.
  - **Complex Family Dynamics:** In consanguineous families, complex family dynamics can develop, as multiple roles and relationships intersect.
    - This can lead to conflicts and tensions related to **decision-making and family hierarchies.**
  - **Potential Erosion of Individual Autonomy:** In closely-knit consanguineous communities, there can be an **erosion of individual autonomy**, where decisions related to marriage, family planning, and other life choices are heavily influenced by the **family or community,** potentially limiting personal freedom.
  - **Silenced Voices in Domestic Violence Cases:** In consanguineous relationships, women may be **discouraged from reporting domestic violence** due to familial and cultural pressures to preserve family respect.
    - This silence can **perpetuate the cycle of abuse,** making it difficult to seek help or intervention in cases of domestic violence.

Way Forward

Consanguinity, a practice entwined with culture, genetics, and societal norms, **necessitates a delicate balance.** To tackle its challenges, there is a need to respect cultural values while addressing social and health issues through **education, legal safeguards, and support services like personalized medicine and genetic counselling.** Empowering **individuals to make informed choices** while preserving cultural heritage is also crucial.

6. Cancer Cells' Resistance to Chemotherapy

Why in News?

Recently, a new study, published in ***Cell Reports*** carried out by researchers at the Netherlands Cancer Institute made a breakthrough in understanding why **certain cancer cells resist a drug called anti-cancer drug (chemotherapeutic agents) Taxol.**

- Their research has the potential to improve cancer treatment by finding ways to overcome this resistance, bringing hope to patients facing this formidable adversary.

What are the Key Highlights of the Study?

- **Challenges of Chemotherapy:**

- Chemotherapy is a fundamental cancer treatment but poses significant challenges.
- It involves the **targeting of rapidly dividing cancer cells**, often leading to programmed cell death or apoptosis.
  - However, this mechanism also affects non-cancerous cells. Any tissue with a significant number of normal cells that are also dividing, such as cells in the digestive tract, the bone marrow, and hair follicles are also affected by **chemotherapeutic agents** and **suffer apoptosis.**
  - This cell death underlies the **unpleasant side-effects of chemotherapy**, such as painful **inflammation of the oral cavity and the gut, nausea, diarrhoea, anaemia, and hair loss.**
- Striking a balance between effective cancer cell destruction and manageable side effects is a challenge faced by oncologists.

- **Antibody-Drug Conjugates (ADCs):**
  - Researchers have developed ADCs as a more targeted approach for certain cancer types.
  - ADCs involve attaching drugs to antibodies designed to **recognize proteins predominantly found in cancer cells.**
    - This targeted delivery helps direct chemotherapy directly to cancer cells while sparing healthy ones, reducing collateral damage.
- **Chemotherapy Resistance:**
  - Some **cancer cells can evade the effects of chemotherapy,** which may lead to a **higher risk of cancer relapse.**
    - The study focuses on understanding resistance to Taxol, a commonly used chemotherapeutic agent.
  - **The Role of the ABCB1 Gene:**
    - Resistance to Taxol is closely linked to the **location of the ABCB1 gene** within the cell's nucleus.
    - Sensitive cells exhibit different ABCB1 gene locations compared to resistant cells.
    - In resistant cells, the **gene has detached from the nuclear envelope (membrane) and shifted deeper into the nucleus.**
    - This relocation results in a remarkable 100-fold increase in RNA corresponding to the ABCB1 gene.
- **P-gp Efflux Pump:**
  - The increased RNA levels lead to the production of the **P-gp efflux pump**, which plays a **pivotal role in chemotherapy resistance.**
    - The P-gp pump effectively removes **Taxol and other toxic compounds from the cell**, preventing their accumulation at levels necessary to **arrest cell division and trigger apoptosis.** This allows **cancer cells to persist.**
- **Identifying Lamin B Receptor (LBR):**
  - Researchers sought to understand what anchors the ABCB1 gene to the nuclear envelope in sensitive cells.
    - The study identified the **Lamin B Receptor (LBR) as a crucial protein** influencing the **ABCB1 gene's location and activation.**
  - When LBR is absent, **cells can activate the ABCB1 gene** when exposed to Taxol. However, deleting the gene responsible for making LBR doesn't immediately increase ABCB1 expression; it requires exposure to Taxol. This indicates the involvement of additional factors in silencing ABCB1.
- **Variability in Cancer Cell Responses:**
  - The study highlights variations in how different types of cancer cells respond to the absence of LBR.
    - Some, like lung cancer cells, expressed high levels of ABCB1 RNA.
    - Depleting LBR in lung cancer cells didn't significantly increase Taxol resistance.
    - Breast cancer cells, on the other hand, showed an increased Taxol-resistant fraction after LBR depletion, unlike head and neck cancer cells.
  - This variability in responses of different cancer cells depends on LBR to varying degrees to tether genes to the nuclear envelope.

Chemotherapy

- It is a type of **cancer treatment** that uses powerful anti-cancer drugs to kill **fast-growing cells in the body.** Cancer cells **grow and multiply much more quickly than most cells** in the body.
- Chemotherapy can be used alone or in combination with other therapies, such as surgery, radiation, or hormone therapy.

Cancer

- It is a complex and broad term used to **describe a group of diseases characterised by the uncontrolled growth and spread of abnormal cells in the body.**

- These abnormal cells, **known as cancer cells**, have the ability to invade and destroy healthy tissues and organs.
- In a healthy body**, cells grow, divide, and die in a regulated manner,** allowing for the normal functioning of tissues and organs.
  - However, in the case of cancer, certain genetic mutations or **abnormalities disrupt this normal cell cycle,** causing cells to divide and grow uncontrollably.
  - These cells can form a mass of tissue called a **tumour.**

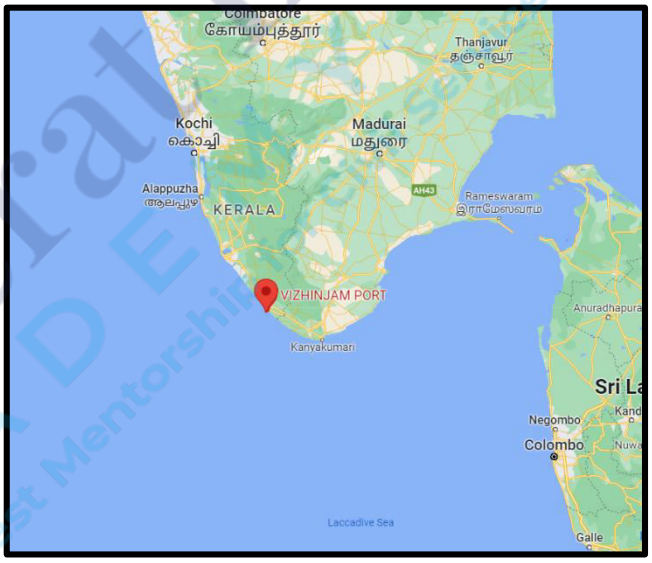
What are the Government Initiatives Related to Cancer Treatment?

- National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke.
- National Cancer Grid.
- National Cancer Awareness Day.
- HPV Vaccine.

7. Vizhinjam International Seaport Project

Why in News?

The **Vizhinjam International Seaport Project**, India's first deep-water transhipment port, has gained attention recently as the **first cargo ship arrived at the port.**



Note

- A transhipment deep-water seaport is a port that can handle large ships that carry cargo from one place to another.
- It has a **deep water channel and a large berth area** for loading and unloading goods. It also allows the transfer of cargo from one ship to another at the port.

What is the Vizhinjam International Seaport Project?

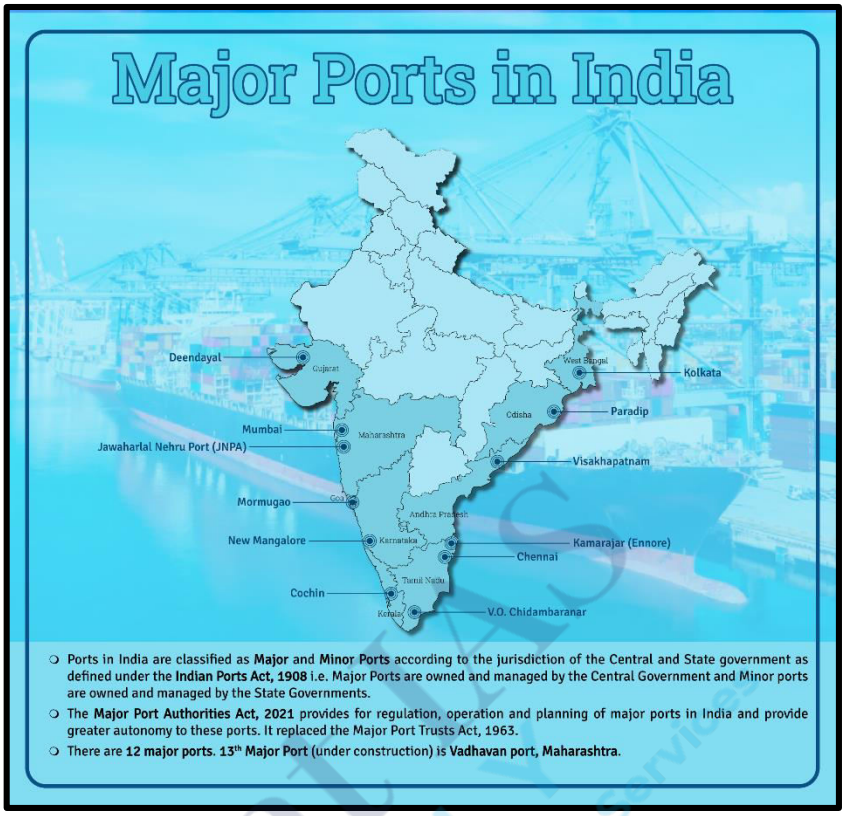
- The Vizhinjam International Transhipment Deepwater Multipurpose Seaport is an ambitious project taken up by the **Government of Kerala.**
  - It is designed to primarily cater to the **transhipment and gateway container business** with provision for a cruise terminal, liquid bulk berth and facilities for additional terminals.
- The port is currently being developed with a **Public Private Partnership**, with **Adani Ports Private Limited** with a component structured on a **design, build, finance, operate, and transfer ("DBFOT") basis.**
- It is strategically situated near **Thiruvananthapuram, Kerala.** Its location along the southern coast of India provides easy access to **international shipping routes.**
  - It is positioned to compete with global transhipment hubs like **Colombo, Singapore, and Dubai,** reducing the **cost of container movement** to and from foreign destinations.
- The port boasts a **natural depth of more than 18 meters,** which can be further scaled up to 20 meters.
  - This depth is crucial as it enables the port to accommodate large vessels and mother ships with substantial cargo capacities.
- Initial capacity in the **first phase is set at one million (twenty-foot equivalent units) TEUs,** with the potential for expansion to 6.2 million TEUs.
- **Project Progress:**
  - Expected to generate 5,000 direct job opportunities and stimulate an industrial corridor and cruise tourism.
  - The project is approximately **65.46% complete**. The project has experienced delays over the years, mainly due to factors like natural disasters, protests, and logistical challenges.
    - The current timeline anticipates the first phase's operational readiness by December 2024.

Why India Needs a Deepwater Container Transhipment Port?

- India has **12 major ports.** However, the country lacks a **landside mega-port and terminal infrastructure** to deal with ultra-large container ships.

- Hence, nearly **75% of India's transhipment cargo** is handled at ports **outside India**, mainly Colombo, Singapore, and Klang.

- In fiscal 2021-22, the total transhipment cargo of India was about **4.6 million TEUs, out of which about 4.2 million TEUs** were handled outside India.
- Developing a port into a Transhipment Hub will accrue significant benefits such as **forex savings, foreign direct investment**, **and increased economic activity** at other Indian Ports, development of related logistics infrastructure, employment generation, improved operation/logistics efficiencies and increase in revenue share.
  - It also encourages related businesses, including ship services, logistics, and bunkering.
- A deep-water container transhipment port can attract a large share of the container transhipment traffic which is now being diverted to Colombo, Singapore and Dubai.



8. Implementing Kunming-Montreal Global Biodiversity Framework

Why in News?

Recently, the 25th meeting of the **Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA-25)** in Nairobi, Kenya concluded with recommendations aimed at facilitating the transition from agreement to action following the adoption of the **Kunming-Montreal Global Biodiversity Framework (KMGBF)** in December 2022.

- The meeting primarily focused on creating a progress monitoring mechanism, while also addressing the implications of assessments conducted by the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** and the **Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6),** among other matters.

What is the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA)?

- Article 25 of the **Convention on Biological Diversity establishes an open-ended intergovernmental scientific advisory body known as the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA).**
- Its purpose is to provide the Conference of the Parties (COP) and, as appropriate, its other subsidiary bodies, with **timely advice relating to the implementation of the Convention.**

What Was the Recent SBSTTA-25 Meeting About?

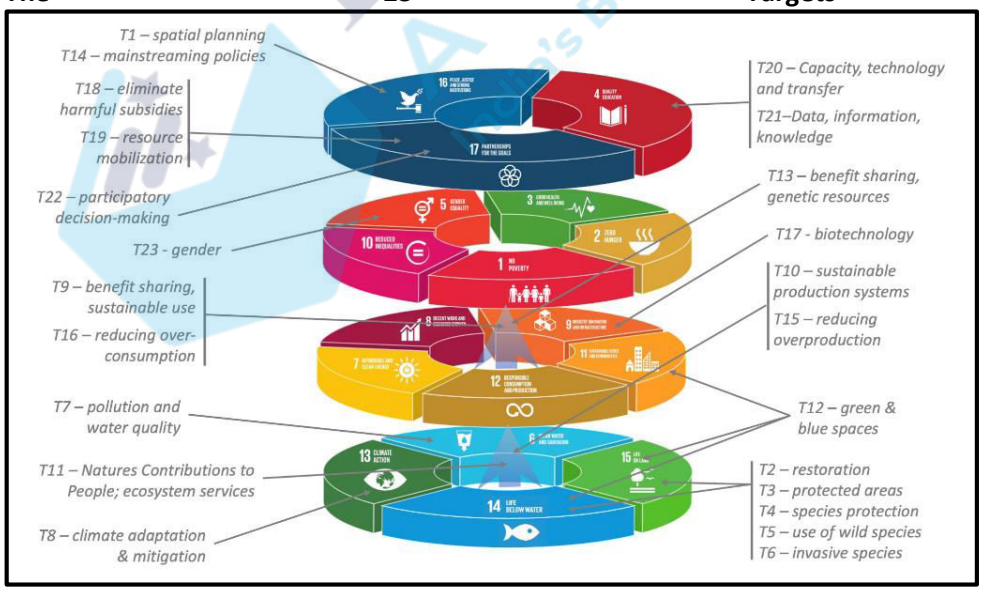
- **IPBES Reports on Invasive Species and Biodiversity Valuation:**
  - The recent IPBES report has highlighted the critical role that **invasive species** play in driving the extinction of plants and animals. Additionally, **the Methodological Assessment Report on Diverse Values and Valuation of Nature, as well as the Thematic Assessment Report on the Sustainable Use of Wild Species,** were discussed.
  - These findings shed light on the intricate relationship between biodiversity and the impact of invasive species.
- **IPCC AR6 Findings on Biodiversity and Climate Change:**
  - The findings from the **IPCC AR6 report** were also a focal point of discussion. The report underscores that climate change is the **primary driver of biodiversity loss and emphasizes the capacity of biodiversity to support climate adaptation, resilience, mitigation, and disaster risk reduction.**

- This connection between biodiversity and climate change has significant implications for global environmental management.

- **Converging Crises**
  - During the meeting, experts recognized that **biodiversity loss, climate change, ocean acidification, desertification, land degradation, invasive alien species, and pollution are interconnected crises.**
- **Recommendations:**
  - To address these challenges coherently and effectively, **the group finalized 15 key points for presentation at the 16th meeting of the Conference of the Parties (COP16) to the Convention on Biological Diversity (CBD).**
  - This approach aligns with the goals of the Convention, the Kunming-Montreal Global Biodiversity Framework, and other global initiatives such as the **United Nations Framework Convention on Climate Change** and the **2030 Agenda on Sustainable Development.**
  - Moreover, the meeting **emphasized the importance of utilizing the work of other multilateral agencies, including the World Health Organization and the Food and Agriculture Organization,** to enhance scientific and technical guidance in implementing the Kunming-Montreal Global Biodiversity Framework.

What is the Kunming-Montreal Global Biodiversity Framework?

- **About:**
  - The Kunming-Montreal Global Biodiversity Framework (GBF) was adopted during the fifteenth meeting of the **Conference of the Parties (COP)-15** of CBD following a four-year consultation and negotiation process.
  - This historic Framework, which supports the **achievement of Sustainable Development Goals** and builds on the Convention's previous Strategic Plans, sets out an ambitious pathway to reach the **global vision of a world living in harmony with nature by 2050.**
- **30 by 30 Target:**
  - The declaration made a reference to the **'30 by 30'** target which is a key proposal being debated at the **COP15**, that would afford 30% of the Earth's land and oceans protected status by 2030.
- **Main Targets:**
  - The framework consists of four goals for 2050 and 23 targets for 2030.
    - **The four goals are:**
      - Conserve and restore biodiversity.
      - Ensure sustainable use of biodiversity.
      - Share benefits fairly and equitably.
      - Enable transformative change.
    - **The 23 Targets are:**



Kunming Biodiversity Fund

- China has also pledged to inject **USD 233 million** into a new fund to protect biodiversity in developing countries. The fund is being referred to by **China as Kunming Biodiversity Fund.**
- Further, some rich country donors say a new fund for conservation is unnecessary because the **United Nations' Global Environment Facility** already helps developing nations finance green projects.

9. United Nations Convention to Combat Desertification Data

Why in News?

Recently, the **UN Convention to Combat Desertification (UNCCD)** has announced the launch of it's **first-ever Data Dashboard,** which shows that Land Degradation is advancing at an astonishing rate across all regions.

- It compiled national reporting figures from 126 countries to provide a comprehensive overview of the **Land Degradation** situation globally.
- The 21st session of the UNCCD will take place in Samarkand, Uzbekistan, in November 2023. This session will focus on reviewing global progress towards achieving **Land Degradation Neutrality (LDN)** and addressing related issues.

What is Land Degradation Neutrality (LDN)?

- LDN is a simple idea and a powerful tool, means to secure **enough healthy and productive natural resources** by **avoiding Degradation** whenever possible and restoring land that has already been degraded.
- At its core are **better land management practices** and better **land-use planning** that will improve economic, social and ecological sustainability for present and future generations.
- LDN provides significant **benefits in terms of mitigation and adaptation to climate change.** Halting and reversing land degradation can transform the **land from being a source of Greenhouse Gas Emissions (GHG)** to a carbon sink, by increasing carbon stocks in soils and vegetation.

What are the Key Highlights of the UNCCD Data on Land Degradation?

- **Land Degradation Trends:**
  - From 2015 to 2019, the world lost over **100 million hectares** of productive land annually, which is **twice the size of Greenland.**
  - Land degradation is **worsening rapidly on a global scale.**
- **Regional Variances:**
  - Eastern and Central Asia, Latin America, and the Caribbean experience **severe degradation**, impacting at least **20% of their total land area.**
  - Sub-Saharan Africa, Western and Southern Asia, Latin America, and the Caribbean hav**e experienced land degradation rates faster** than the **global average.**
  - In sub-Saharan Africa and in Latin America and the Caribbean, 163 million hectares and 108 million hectares, respectively, have **succumbed to land degradation since 2015.**
- **Bright Spots:**
  - Some countries have shown progress in combating land degradation. For instance, **in sub-Saharan Africa, Botswana reduced land degradation from 36% to 17%** of its territory.
    - The country has **committed a total of 45.3 million hectares to LDN,** including both measures to avoid further degradation as well as restoration interventions in selected land degradation hotspots.
  - In the Dominican Republic, **the proportion of degraded land has decreased from 49% to 31% between 2015 and 2019,** with ongoing efforts to restore 240,000 hectares in the Yaque del Norte River basin and cocoa production areas in San Francisco de Macoris province.
  - While Uzbekistan reported the highest proportion of degraded land (26.1%) in the Central Asia region, it also saw the largest decrease – **from 30% to 26% compared to 2015.**
    - Between 2018-2022, Uzbekistan carried out saxaul planting to eliminate salt and dust emissions from the **drained bottom of the Aral Sea.**
- **India's Statistics:**
  - Degraded Land Area in India has been increased from **4.42% in 2015 to 9.45 % in 2019.**

What are the Recommendations of UNCCD to Achieve LDN Targets?

- The UNCCD data emphasizes the need to restore 1.5 billion hectares of degraded land by 2030 to achieve LDN targets outlined in the United Nations **Sustainable Development Goals.**
- The UNCCD highlights that although global trends are concerning, it is still possible to **meet or exceed LDN goals by stopping further degradation** and accelerating restoration efforts.
- Many countries have set voluntary LDN targets for 2030, and funding is crucial for these efforts.

What is Land Degradation?

- **About:**
  - Land degradation is caused by **multiple forces, including extreme weather** conditions, particularly drought.

- It is also caused by **human activities that pollute or degrade** the quality of soils and land utility.

- **Impact:**
  - **Desertification** is a consequence of severe land degradation and is defined as a process that creates arid, semi-arid and dry sub-humid areas.
  - It accelerates **Climate Change** and biodiversity loss and contributes to droughts, wildfires, involuntary migration and the emergence of **Zoonotic Infectious Diseases.**

What are the Efforts to Curb Land Degradation?

- **Global Efforts:**
  - The **Bonn Challenge:** To bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.
  - **Great Green Wall**: Initiative by the **Global Environment Facility (GEF)**, where eleven countries in Sahel-Saharan Africa have focused efforts to fight against land degradation and revive native plant life to the landscape.
- **India's Efforts:**
  - **Integrated Watershed Management Programme (IWMP) (Pradhan Mantri Krishi Sinchayee Yojana)**
  - **The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS),**
  - Soil Conservation in the Catchment of River Valley Project,
  - National Watershed Development Project for Rainfed Areas (NWDPRA).
  - **Desertification and Land Degradation Atlas by ISRO (Indian Space Research Organisation).**

What is the United Nations Convention to Combat Desertification (UNCCD)?

- **About:**
  - **Established in 1994**, it is the sole **legally binding international agreement** linking environment and development to sustainable land management.
  - It addresses specifically the arid, semi-arid and dry sub-humid areas, known as the dry-lands, where some of the most vulnerable ecosystems and peoples can be found.
  - The Convention's 197 parties work together to improve the living **conditions for people in dry-lands**, to maintain and restore land and soil productivity, and to mitigate the effects of drought.
  - The UNCCD works with the other two Rio Conventions to address the interlinked challenges of land, climate and biodiversity:
    - The **Convention on Biological Diversity (CBD).**
    - The **United Nations Framework Convention on Climate Change (UNFCCC).**
- **UNCCD 2018-2030 Strategic Framework:**
  - It is the most comprehensive global commitment to achieve Land Degradation Neutrality (LDN) to restore the productivity of vast expanses of degraded land, improve the livelihoods of more than 1.3 billion people, and reduce the impacts of drought on vulnerable populations.
- **UNCCD and Sustainable Development:**
  - Goal 15 of SDG, 2030 declares that "we are determined to protect the planet **from degradation, including through sustainable consumption and production**, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations".

10. Nutrient Based Subsidy

Why in News?

Recently, the union cabinet has approved **Nutrient Based Subsidy (NBS)** rates for the various nutrients of **Rabi and Kharif Season for 2022-23.**

- For Rabi Season **2022-23:** NBS approved for various nutrients i.e. **Nitrogen (N), Phosphorus (P), Potash (K) and Sulphur (S)**
- **For Kharif Season 2023:** NBS rates approved for Phosphatic and Potassic (P&K) Fertilizers.

What is a Nutrient Based Subsidy (NBS) Regime?

- **About:**
  - Under the NBS regime – fertilizers are provided to the farmers at subsidized rates based on the **nutrients (N, P, K & S) contained in these fertilizers.**

- Also, fertilizers that are fortified with **secondary and micronutrients** such as **molybdenum (Mo) and zinc** are given additional subsidies.
- The subsidy on P&K fertilizers is announced by the Government on an annual basis for each nutrient on a **per kg basis** – which is determined taking into account the **international and domestic prices of P&K fertilizers, Exchange Rate**, inventory level in the country etc.
- The NBS policy intends to increase the **consumption of P&K fertilizers** so that the optimum balance **(N:P:K= 4:2:1)** of NPK fertilization is achieved.
  - This would **improve soil health** and as a result, the yield from the crops would increase, resulting in **enhanced income to the farmers.**
  - Also, as the **government expects rational use of fertilizers,** this would also ease off the **burden of fertilizer subsidy.**
- It is being implemented from **April 2010 by the Department of Fertilizers, Ministry of Chemicals & Fertilizers.**

- **Significance:**
  - Availability of Subsidized P&K Fertilizers will ensure the availability of **DAP (Di-Ammonium Phosphate** and other P&K fertilizers to farmers at subsidized, affordable, and reasonable prices during the Kharif season. This is essential to support agricultural productivity and **food security** in India.
  - The NBS subsidy is crucial for effective resource allocation and ensuring that subsidies are directed toward the **farmers who need them the most,** promoting efficient and **sustainable agricultural practices.**

What are the Issues Related to NBS?

- **Economic and Environmental Costs:**
  - The fertilizer subsidy, including the NBS policy, imposes a **significant financial burden** on the economy. It ranks as the second-largest subsidy after food subsidies, straining fiscal health.
  - Additionally, imbalanced fertilizer usage due to the pricing disparity has adverse **environmental consequences,** such as soil degradation and nutrient runoff, impacting long-term agricultural sustainability.
- **Black Marketing and Diversion:**
  - Subsidized urea is **susceptible to Black Marketing** and diversion. It is sometimes **illegally sold to bulk buyers**, traders, or non-agricultural users like plywood and animal feed manufacturers.
  - Moreover, there are **instances of subsidized urea being smuggled** to neighbouring countries like Bangladesh and Nepal, leading to the loss of subsidized fertilizers intended for domestic agricultural use.
- **Leakage and Misuse:**
  - The NBS regime relies **on an efficient distribution system** to ensure that subsidized fertilizers reach the intended beneficiaries, i.e., farmers.
  - However, there may be instances of leakage and misuse, where subsidized fertilizers **do not reach farmers or are used for non-agricultural** purposes. This undermines the effectiveness of the subsidy and denies genuine farmers access to affordable fertilizers.
- **Regional Disparities:**
  - Agricultural practices, soil conditions, and crop nutrient requirements vary across different regions of the country.
  - Implementing a uniform NBS regime may not adequately address the specific needs and regional disparities, potentially leading to suboptimal nutrient application and productivity variations.

Way Forward

- A uniform policy for all fertilizers is necessary, as nitrogen (N), phosphorus (P), and potassium (K) are **crucial for crop yields and quality.**
- In the long term, NBS could be replaced by a flat per-acre cash subsidy that allows farmers to purchase any fertilizer.
- This subsidy should encompass **value-added and customized products** that provide efficient nitrogen delivery and other essential nutrients.
- It is crucial to strike a balance between price control, affordability, and sustainable nutrient management to achieve the desired outcomes of the NBS regime.

What are the Major Cropping Seasons?

Kharif Crops	**Rabi Crops**
Crops that are sown during the southwest monsoon season are called kharif or monsoon crops.	Those that are sown around the Retreating Monsoon and Northeast monsoon season, which begins by October are called rabi or winter crops.
These crops are sown at the beginning of the season around end May to early June and are harvested post the monsoon rains beginning October.	The harvest for these crops happens typically during April and May, during the summer season.
These crops depend on the rainfall patterns.	These crops depend on the rainfall patterns.
Rice, maize, pulses such as urad, moong dal and millets are among the key kharif crops.	Major Rabi crops are wheat, gram, peas, barley etc.
It requires a lot of water and hot weather to grow.	A warm climate is required for seed germination and cold climate for the growth of crops.
Zaid Crops ▪ Sown and harvested: March-July (between Rabi and Kharif) ▪ Important Zaid crops include: Seasonal fruits, vegetables, fodder crops etc	

GS Paper – 4

1. Concerns of Caste-Based Discrimination

Why in News?

The recent directive by the Patan District Collector, mandating the transfer of all ration cards from a Dalit-run **Fair Price Shop (FPS)** in Kanosan village to a neighbouring village, raises important ethical and constitutional questions.

What is a Fair Price Shop (FPS)?

- FPS is a government-run or government-regulated retail outlet or store in India.
  - The primary purpose of fair-price shops is to **distribute essential commodities like food grains, edible oils, sugar,** and other basic necessities to the public at subsidized or fair prices.
  - These shops are typically part of **government welfare programs** aimed at ensuring food security and reducing the economic burden on low-income households.
    - This system has a robust mechanism for verification of beneficiaries through **Aadhaar authentication** and has features to monitor transactions online with the help of electronic Point of Sale (e-POS) machines.
    - The **e-PoS devices have been integrated with electronic weighing machines** to ensure the beneficiaries get the correct amount of ration.
    - These FPSs and ePOS machines have proved instrumental in the effectuation and seamless implementation of the One Nation **One Ration Card Scheme (ONORC).**

What are the Different Ethical Aspects Involved in the Incident?

- **Ethical Issues:**
  - **Discrimination and Social Equity**
    - The core ethical issue in this case is **discrimination** based on caste leading to the transfer of ration cards.
  - **Dereliction of Duty:**
    - The district collector's directive to transfer ration cards can be seen as a **dereliction of duty.**
    - The ethical principle of integrity, where public officials are expected to act in the best interest of all citizens without favouritism should be practised.
  - **Mental Health and Well-being**
    - The mental trauma experienced by, the victim of caste-based discrimination, leading to a suicide attempt and physical injury, is a significant ethical concern.
    - Ethical principles of **compassion, empathy, and the duty to protect individuals' well-being become important.**
  - **Use of Legal Framework**
    - The convenors of the **Right to Food Campaign** call for the application of legal frameworks like the SC/ST Act and the National Food Security Act.
    - The ethical principle of upholding the **rule of law** and respecting the constitution should be abided by.
  - **Empowerment of Marginalized Communities**
    - The violation of the mandated principles related to the empowerment of **marginalized communities** is a key ethical concern.
    - Ethical principles of fairness, equity, non-discrimination, justice and equality should be adhered to.
  - **Moral Responsibility**
    - The **moral responsibility** of the district collector and the upper caste households in addressing the consequences of their actions is raised.

What are the Other Perspectives on the Incident?

- **Violation of Constitutional Mandates:**
  - The Indian Constitution enshrines fundamental values of **equality, justice, and non-discrimination as enshrined under Fundamental Rights (FRs) in Part-III (Article 17)** of the Constitution.
  - **Discriminatory actions** such as actions based on caste contradict these constitutional principles
- **Violation of Statutory Mandates:**

- **Non-implementation of Scheduled Caste and Scheduled Tribe (Prevention of Atrocities) Act, 1989 (Amended 2015):**
  - The discriminatory treatment of a Scheduled Caste person falls under the purview of the **SC/ST Act, 1989** which aims to prevent and punish atrocities against marginalized communities.
  - It emphasizes the **need for strict action against caste-based discrimination and violence.**
- **National Food Security Act:**
  - The act upholds the democratic empowerment of FPSs in villages, advocating for distribution control to marginalized communities.
  - The transfer of ration shops to another FPS violates the spirit of this legislation.

What Action Could Be Taken in the Similar Situations?

- **Preventive Steps:**
  - **Raising Awareness:**
    - Model of **Mid-Day Meals Scheme** implementation can be adopted where high dignitaries eat the cooked food to bust the myths of caste stigma and discrimination.
- **Punitive Action:**
  - Further legal action must be taken to address the **caste-based discrimination and social boycott effectively.**
    - Linking such erroneous activities with **Annual Confidential Reports** of Bureaucrats such that it acts as a deterrence in the future.
  - **License Revocation:**
    - The impending **revocation of the Dalit FPS dealer's license** raises concerns about economic repercussions and livelihoods.
- **Call for Suo Motu Cognizance:**
  - The Right to Food Campaign urges the **High Courts or Chief Minister's Office** of the government to take **Suo Motu cognizance** of the discriminatory ration card transfers.
  - Such action is essential to uphold the rule of law and constitutional values.
- **Democratic Empowerment and Inclusivity:**
  - **Role of Fair Price Shops (FPSs):**
    - FPSs play a crucial role in **ensuring food security and access to essential commodities** for marginalized communities.
    - Democratic empowerment of FPSs is vital to promote inclusivity and economic well-being.

Conclusion

- Caste-based discrimination and social boycotts have inflicted severe harm on shop owners, emphasizing the urgent need for **justice and accountability. Upholding the values of social equity, justice, and inclusivity are not just a legal obligation but a moral imperative for a democratic and diverse society.**
- This incident serves as a stark reminder of the ongoing challenges in **eradicating caste-based discrimination and upholding constitutional values in India.**

2. Ethics & Transparency Reforms in Lok Sabha

Why in News?

Two crucial reforms are pending within the Lok Sabha, aiming at fostering **Ethical Conduct** and transparency among its members. These are the formulation of a **Code of Conduct for members of Lok Sabha (LS)** and a **Declaration of Members' Business Interests.**

What is the Code of Conduct?

- **Background:**
  - A code for **Union ministers was adopted,** and state governments were advised to adopt it as well.
    - Now the Code of Conduct is applicable to **both Union and State ministers.**
  - In the case of MPs, the first step was the **constitution of Parliamentary Standing Committees on Ethics** in both the Houses.
    - The Committee in Rajya Sabha was inaugurated in **1997 to oversee the moral and ethical conduct** of the Members and to examine the cases referred to it with reference to ethical and other misconduct of Members.

        - The first Ethics Committee in **Lok Sabha was constituted in the year 2000** and since then, the issue of a **Code of Conduct** has been periodically discussed and recommended.
- **Delay and Current Status:**
    - The Ethics Committee of Lok Sabha has been deliberating on the Code of Conduct for over eight years, reflecting a **prolonged delay in addressing** this vital issue.
    - The matter was first brought up in **December 2014 when the Lok Sabha Ethics Committee** submitted a report with proposed amendments to the Rules of Procedure and Conduct of Business in Lok Sabha.
        - The Code of Conduct has **long been applicable to members** of the Rajya Sabha.
- **The Need for a Code of Conduct:**
    - The Code's purpose is to guide and ensure appropriate behaviour and conduct among Lok Sabha MPs, enhancing the integrity of parliamentary proceedings.
    - The historical context dating back almost a century underscores the long-standing concerns about conflicts of interest and the need for regulatory frameworks.
    - The significance of a **Code of Conduct is highlighted** in promoting good governance, maintaining transparency, and ensuring MPs' adherence to ethical standards.

What is the difference between Code of Ethics and Code of Conduct?

- **Code of Ethics is an aspirational document**, issued by the board of directors containing core ethical values, principles, and ideals of the organization.
    - A Code of Conduct is a **directional document** containing specific practices and behaviour that are followed or restricted under the organization.
- Code of Conduct originated **from the code of ethics,** and it converts the rules into specific guidelines that must be followed by the members of the organization.
    - Therefore, the latter **concept is wider than the former.**
- **Code of Ethics regulates the judgment of the organization** while a code of conduct regulates the actions.
- **Code of Ethics focuses on values or principles.** On the other hand, the Code of Conduct is focused on compliance and rules.
- Code of Ethics is publicly available, i.e. anyone can access it. Conversely, the Code of Conduct is addressed to employees only.

What is the Declaration of Members' Business Interests?

- **About:**
    - It is a practice already **in place for Rajya Sabha members.**
    - The purpose is to identify and disclose any personal, pecuniary, or direct interests that could potentially create conflicts of interest, fostering transparency and accountability.
- **Long-Running Saga:**
    - Concerns about **conflicts of interest for Members of Parliament (MPs)** were raised as far back as 1925.
    - In 2012, the **Lok Sabha Ethics Committee suggested** adopting the Rajya Sabha's practice of maintaining a 'Register of Members' Interests.'
        - This register provides information about MPs' financial and personal interests.
    - **Rule 293 in the Rajya Sabha outlines** the requirement for this register, which can be accessed by MPs and even ordinary citizens through the **RTI (Right To Information) Act.**
    - The Lok Sabha Secretariat provided an extract, Paragraph 52A, from a publication of Parliament titled 'Directions by the Speaker Lok Sabha'.
        - This paragraph applies to members of **Parliamentary Committees, not to all MPs.**
        - **The extract ("Personal, pecuniary or direct interest of member") says: "**
        - (1) Where a member of a Committee has a personal, pecuniary or direct interest in any matter **which is to be considered by the Committee,** such member shall state one's own interest therein to the Speaker through the Chairperson of the Committee.
        - (2) After considering the matter, the Speaker shall give a decision which shall be final."

What are the Recommendations of the Second ARC?

- In addition to the existing Code of Conduct for Ministers, there should be a **Code of Ethics to provide guidance on how Ministers should uphold** the highest standards of constitutional and ethical conduct in the performance of their duties.

- Dedicated units **should be set up in the offices of the Prime Minister (PM)** and the Chief Ministers (CM) to monitor the observance of the Code of Ethics and the Code of Conduct. The unit should also be empowered to receive public complaints regarding violations of the Code of Conduct.
- The PM or the CM should **be duty-bound to ensure the observance of the Code of Ethics** and the Code of Conduct by Ministers.
- An annual report with regard to the **observance of these Codes should be submitted** to the appropriate legislature. This report should include specific cases of violations, if any, and the action taken thereon.
- The Code of Ethics should **inter alia include broad principles of the Minister-civil servant relationship** and the Code of Conduct.
- The Code of Ethics, the Code of Conduct and the annual report should be put in the public domain.

Conclusion

- The adoption and implementation of **these reforms** are **crucial** in fostering **Ethical Conduct and Transparency** within the Lok Sabha.
- These initiatives will contribute to a **more accountable and responsible parliamentary system,** ultimately benefiting the democratic process and the nation as a whole.

3. CCSEA Withdraws Stray Dogs from Vaccine Trials

Why in News?

Recently, the **Committee for Control and Supervision of Experiments on Animals (CCSEA)** in India has **withdrawn its recommendation to employ stray dogs in vaccine trials.**

- This decision comes in response to concerns raised by **People for the Ethical Treatment of Animals (PETA) India** regarding the **scientific and ethical implications of using stray dogs in experiments.**

What were the Concerns Raised Regarding CCSEA's Recommendation to Use Stray Dogs in Vaccine Trials?

- PETA emphasized that the CCSEA's recommendation to employ stray dogs in vaccine trials, contradicted its obligations under the **Prevention of Cruelty to Animals Act, 1960**, and the **Breeding of and Experiments on the Animals (Control and Supervision) Amendment Rules, 2006.**
  - Also, it pointed out that the recommendation to **use stray dogs contrasted with the policies adopted by the EU, UK, US, and Australia,** India's counterparts in the field of science and technology.
- PETA India has argued that **relying on stray dogs in tests cannot accurately predict human responses to vaccines,** leading to delays in the approval of effective treatments.
  - The withdrawal of this recommendation represents a positive stride toward safeguarding animal welfare and fostering scientific progress.

Note

PETA India is an animal rights organization. It's a **non-governmental organization (NGO)** that works to **end animal abuse in business and society.**

- PETA India's mission is to: raise awareness about animal cruelty, educate policymakers and the public and promote respect for all animals

What is the Committee for Control and Supervision of Experiments on Animals?

- **About**:
  - **CCSEA** is a **statutory** Committee of the **Department of Animal Husbandry and Dairying (DAHD), Ministry of Fisheries, Animal Husbandry and Dairying (MoFAH&D)** constituted under the **Prevention of Cruelty to Animals (PCA) Act, 1960.**
- **Function:**
  - CCSEA is duty bound to take all such measures as may be necessary to ensure that **animals are not subjected to unnecessary pain or suffering before, during or after the performance** of experiments on them.
  - For this purpose, the Committee formulated the **Breeding of and Experiments on Animals (Control & Supervision) Rules, 1998 (amended in 2001 & 2006)** to regulate the experimentation on animals.
    - Under the provisions of the above rules, establishments that are engaged in Bio-medical research, breeding and trading of laboratory animals are **required to get themselves registered with CPCSEA.**

What is the Prevention of Cruelty to Animals Act, 1960?

- It is an act of the Parliament of India that **prevents the infliction of unnecessary pain or suffering on animals.**
  - The act was originally passed in 1890 and **replaced by the 1960 act.**
- The act provides for the prevention and protection of animals from **Cruelty, Unnecessary pain, Overwork, Torture and Abuse.**
  - The act also established the **Animal Welfare Board of India.**

4. Crop Switching for Sustainable Agriculture

Why in News?

A recent study, featured in the **journal Nature Water,** was conducted by a team of researchers from the Indian Institute of Technology Bombay, the University of Delaware, Columbia University, and Yale School of the Environment.

- This study focuses on addressing **water consumption and sustainable agriculture in India's northern plains,** particularly the **Indo-Gangetic region.**
- The study focused on 124 districts in Uttar Pradesh, Bihar, and West Bengal, covering the upper, middle, and lower **Ganga** basin in India.

What are the Key Findings from the Study?

- **Water Conservation through Crop Switching:**
  - Replacing rice with **millets (pearl millet (bajra) and sorghum)** during the **Kharif season** and shifting from **wheat to sorghum in the Rabi season** can reduce water consumption in the **Indo-Gangetic Plains (IGP) by 32%**. And boost **farmers' profits by 140%.**
- **Beyond Water Conservation:**
  - Crop switching can improve **water savings by 55%** in the Kharif season and **9% in the Rabi season.**
  - Farmers' **profits can increase by 139%** during the Kharif season and **152% during the Rabi season.**
  - Calorie production can increase by 39%.
- **Crop Switching vs. Drip Irrigation:**
  - The authors compared the benefits of crop switching vis-a-vis improving irrigation efficiency — from flood to drip irrigation, and found that Crop switching outperforms **drip irrigation** in reducing **groundwater depletion** and energy savings.
  - Drip irrigation improves net **groundwater recharge by 34%**, while crop **switching achieves a 41% improvement.**
    - Drip irrigation alone does not enhance calorie production or farmer profits.
  - A **combination of crop switching and drip irrigation** shows the greatest improvement in net recharge at the district level and **reduces groundwater depletion by 78%.**
- **The Multi-Objective Approach:**
  - A multi-objective approach is essential for achieving a balance between water conservation, increased calorie production, and higher farmer incomes.
  - **Single-focused approaches come with trade-offs**. For instance, prioritizing water conservation alone may boost savings by 4%, but it leads to significant reductions: Calorie production falls by 23%, and Profit drops by 126%, respectively, compared with the proposed solutions.
  - Similarly, a profit-maximizing approach may slightly increase water savings but also reduce calorie production.
    - Choosing a **profit-maximizing strategy centred around sorghum**, with its high minimum support price and low cultivation costs, can significantly boost profits by 58%. However, this gain is coupled with a stark trade-off: a notable 18.5% reduction in calorie production, and a marginal 2% increase in water savings.
- **Nutri Cereals for Improved Nutrition:**
  - Shifting to Nutri **cereals**, including sorghum and bajra, offers improved nutrition.
  - Nutri cereals can lead to a **46% increase in protein production**, a 353% increase in iron production, and an 82% increase in zinc production, benefiting consumers in terms of nutrition.

North Indian Plains

- **About:**
  - They are a large flat landmass that lies south of the Himalayas and north of Peninsular India.

- They are formed by the alluvial deposits of three major river systems: the Indus, the Ganga, and the Brahmaputra, along with their tributaries.
  - They are the largest alluvial tract of the world.

- **Geographical Overview:**
  - The Indo-Gangetic region has a **subtropical climate** with hot summers and cool winters.
  - The northern plains can be divided into **four physiographic regions** based on the nature of the alluvium and the relief features.
    - **Bhabar:**
      - It is a narrow belt of coarse gravel and pebbles along the foothills of the Himalayas. It is about 8 to 16 km wide and has a porous surface that allows water to seep through it.
    - **Terai:**
      - It is a marshy and swampy region south of the Bhabar. It is about 20 to 30 km wide and has rich soil and dense vegetation. It is also home to many wildlife sanctuaries and national parks
    - **Bhangar:**
      - It is the older and higher alluvial plain that lies above the flood level of the rivers. It is composed of clay, silt, and sand.
      - The soil in this region contains calcareous deposits, locally known as kankar.
    - **Khadar:**
      - It is the newer and lower alluvial plain that lies along the river banks. It is composed of fine silt and clay. It has a light colour and is very fertile. It is renewed every year by the floods.
- **Agricultural Significance:**
  - The IGP plays a pivotal role in Indian agriculture, contributing 30% of the country's total food production.
    - It serves as a primary source of food, including staple cereals like rice and wheat.
- **Demographic Significance:**
  - This region is one of the most densely populated areas globally, with an estimated **400 million inhabitants.** The population density, especially along the banks of the Ganges, is exceptionally high.

5. Lok Sabha's Ethics Committee

Why in News?

Recently, **Lok Sabha's Ethics Committee** has initiated an investigation over **'Cash for Query**' allegations on a Member of Parliament (MPs) accused of accepting **"Bribes" to ask questions in Parliament.**

- The committee will conduct proceedings to investigate the allegations and gather evidence from all relevant parties, including the complainant, witnesses, and the accused MP.

What are the Potential Outcomes?

- If the Ethics Committee finds merit in the complaint, it can make recommendations. The potential punishment it can recommend typically involves **Suspension of the MP for a specified period.**
- The House, which includes all MPs, will ultimately decide whether to accept the committee's recommendation and determine the nature and extent of the punishment, if any.
- If the accused were to be expelled or face a potentially adverse decision, she could **challenge it in a court of law.**
  - The grounds for challenging such a decision in court are limited and **typically include claims of unconstitutionality,** gross illegality, or a denial of natural justice.

Note

In 2005, the two Houses adopted motions to expel 10 Lok Sabha MPs and one Rajya Sabha MP who were accused of agreeing to ask questions in Parliament for money. The motion in Lok Sabha was based on the **Bansal Committee's report, a special committee** set up by the Speaker to examine the issue.

- In Rajya Sabha, the complaint was examined by the House Ethics Committee.
- The expelled MPs, demanded that the **Bansal Committee's report** be sent to the Privileges Committee so that the parliamentarians **could defend themselves.**

What is Lok Sabha's Ethics Committee?

- **About:**
  - The members of the Ethics Committee are appointed by the **Speaker for a period of one year.**
- **History:**

- A Presiding **Officers' Conference held in Delhi in 1996** first mooted the **idea of ethics panels** for the two Houses (Lok Sabha and Rajya Sabha)
- Then Vice President (and Rajya Sabha Chairman) K R Narayanan constituted the **Ethics Committee of the Upper House** on 4th March, 1997 to oversee the **Moral and Ethical conduct of members** and examine cases of misconduct referred to it.
  - In the case of Lok Sabha, a study group of the House Committee of **Privileges in 1997** recommended the constitution of an **Ethics committee**, **but it could not be taken up by Lok Sabha.**
- The Committee of Privileges **finally recommended the constitution of an Ethics Committee** during the **13th Lok Sabha.**
- The late Speaker, G M C Balayogi, constituted an **ad hoc Ethics Committee** in 2000, which became a permanent part of the House only in 2015.

- **Procedure for Complaints:**
  - Any person can **complain against a Member** through another Lok Sabha MP, along with **evidence of the alleged misconduct,** and an affidavit stating that the complaint is not **"false, frivolous, or vexatious".**
    - If the Member himself complains, the affidavit is not needed.
  - The Speaker can refer to the Committee **any complaint against an MP.**
  - The Committee does not entertain complaints based only on media reports or on matters that are sub-judice. The Committee makes a **Prima Facie inquiry before deciding to examine** a complaint. It makes its recommendations after evaluating the complaint.
  - The Committee presents its report to the Speaker, who asks the House if the report should be taken up for consideration.
    - There is also a **provision for a half-hour discussion** on the report.

- **Overlap with Privileges Committee:**
  - The work of the Ethics Committee and the **Privileges Committee** often overlap. An allegation of corruption against an MP can be sent to either body, but usually, more serious **accusations go to the Privileges Committee.**
  - The mandate of the Privileges Committee is to **safeguard the "freedom, authority, and dignity of Parliament".**
  - These privileges are enjoyed by individual Members as well as the House as a whole. An MP can be examined for **Breach of Privilege;** a non-MP too can be accused of breach of privilege for actions that attack the authority and dignity of the House.
  - The Ethics Committee can take up only cases of misconduct that involve MPs.

3.10.23

1) Intelligent Grievance Monitoring System (IGMS) 2.0: The Department of Administrative Reforms and Public Grievances (DARPG) launched **IGMS 2.0. Public Grievance portal and Automated Analysis in Tree Dashboard portal.**

- **Ministry**: Ministry of Personnel, Public Grievances and Pensions.
- **Implementing Agency**: IIT Kanpur.
- **Objectives**: To provide instant tabular analysis of Grievances Filed and disposed of, State-wise and district-wise Grievances Filed and ministry-wise data of the Centralised Public Grievance Redress and Monitoring System (CPGRAMS).
- It is **enabled with Artificial Intelligence capabilities.**

2) Index of Industrial Production (IIP): IIP is a ratio that measures the growth of various sectors in the economy.

- IIP data is released every month by the **Central Statistics Office (CSO),** the current base year is 2011-12.
- The IIP comprises 3 broad sectors: **Manufacturing, Mining and Electricity**.
- The **weightage of all 8 core industries in IIP is 40.27 %.**
- In IIP, the decreasing order of core industries among them is as **Refinery Products** (weight: 28.04%) > **Electricity** (19.85%)> **Steel** (17.92%) > **Coal** (10.33%) > **Crude Oil** (8.98%) > **Natural gas** (6.88%)> **Cement** (5.37%)> **Fertilizers** (2.63%).

3) Scheduled Classification of CPSE: Indian Renewable Energy Development Agency Ltd. (IREDA), a Central Public Sector Enterprise (CPSE), has been **upgraded from Schedule B to Schedule A**.

- It will help IREDA in upgrading from **Mini Ratna (Category– I) to Navratna status.**
- CPSEs are classified into 4 Schedules, **namely A, B, C & D.**
- It was **introduced in the year 1965** for the purpose of determining the pay scales of board-level executives.
- Department of Public Enterprises has laid down criteria for categorization and revision (upgradation).
- **Quantitative**: Investment, net sales, profit, etc.
- **Qualitative**: National importance, level of technology, etc.

4) Pink Bollworm (PBW): The infestation by this insect pest has been common in the cotton belt of **northern Rajasthan, Haryana and South-western Punjab since 2021.**

- **Bt (Bacillus thuringiensis) cotton** which **incorporates genes from a soil bacteria** that codes for proteins toxic to the American bollworm, has lost its efficacy against PBW.
- **Scientific Name:** Pectinophora gossypiella (Saunders).
- **Native To**: Possibly the eastern Indian Ocean region.
- **Impact**: Adults lay eggs on cotton bolls; once hatched, the larvae eat the seeds and damage the fibres of the cotton, reducing the yield and quality.

4.10.23

1) Convention on International Transport of Goods Under Cover of TIR Carnets (TIR Convention, 1975): The Central Board of Indirect Taxes and Customs is canvassing support for India's candidature for the TIR Executive Board.

- **Objective of TIR Convention:** Facilitate international transit through simplified Customs transit procedures and an international guarantee system.
- It involves a **common customs document**, a common guarantee system, mutual recognition of customs controls and secured vehicle containers.
- It is the **only universal Customs transit system in existence**.
- **India is one of the Contracting Parties.**

2) Sammakka-Sarakka: PM announced that Central Tribal University will be **established in Mulugu district** (Telangana), named after tribal goddesses Sammakka-Sarakka.

- **Sammakka and Saralamma (or Sarakka), a mother-daughter duo**, fought against a levy of taxes on tribal people during drought conditions by the then **Kakatiya rulers in the 12th century.**
- **Sammakka Saralamma Jathara (State Festival of Telangana) is the largest tribal religious congregation** in the country, held every two years (biennially), in Telangana.

3) 15-minute cities: It is an **urban planning concept** that advocates putting essential services within walking or biking distance of residents to reduce pollution.

- It is a **spatial development model** to help foster a more **local, healthy, equitable and sustainable** way of life.

4) Operation "Kachchhap": The Directorate of Revenue Intelligence (DRI) saved **955 live baby Gangetic turtles in a crackdown on illegal wildlife trade in multicity Operation "Kachchhap".**

- India is one of the world's hotspots for turtle diversity, **representing 29 species of tortoises and freshwater turtles.**
- The **Ganges river system** is home to 13 such species.
- DRI, under the **Central Board of Indirect Taxes and Customs (CBIC), Ministry of Finance**, is the apex agency of the Indian Customs in the field of anti-smuggling in India.

5.10.23

1) International Criminal Court (ICC): Armenia's Parliament voted to join the International Criminal Court

- **Genesis:** Established by **Rome Statute of International Criminal Court in 1998.**
- **About:** It is a permanent international court to investigate and prosecute individuals accused of serious international crimes: **genocide, crimes against humanity, war crimes, and aggression**.
- **Members:** 123 countries are party to the Rome Statute. **India is not a member.**

2) Guaranteed Pension System (GPS): Andhra Pradesh's GPS is a **hybrid of the old pension schemes (OPS) and new pension schemes (NPS).**

- **OPS:** Guarantees the quantum of pension, factors in inflation and pay commission hikes but is costly and unsustainable.
- **NPS:** Market condition decides the quantum of pension, but protects a state's fiscal health.
- **GPS:**
  - It is a **contributory scheme** that guarantees government employees a **monthly pension of 50% of their last-drawn salary** and includes dearness allowance relief.
  - Any short-fall in the returns from NPS is funded by the government.

3) Gravity battery: A gravity battery is a type of electricity storage device that involves lifting (charging) and lowering (discharging) a heavyweight.

- **When there is plenty of green energy, the batteries use the power to lift a heavy weight** (or blocks) either high into the air or to the top of a deep shaft.
- When electricity demand picks up, the blocks are lowered one by one, releasing kinetic energy that is used to rotate a motor and generate electricity.

4) Nanoparticles in Air: A study identified increasing Nanoparticles in Delhi's air.

- A nanoparticle is a **small particle that ranges between 1 to 100 nanometres (10−9 m) in size**.
- In urban environments, nanoparticles are mainly from the combustion process in automobiles and can contribute up to 90% to the total particle number concentration.
- Nanoparticles can penetrate deeper into the **respiratory system than other pollutants**.
- It can be **transported from the respiratory system to other parts of the human body**, creating more chronic and acute illnesses.

6.10.23

1) Enemy properties: The first batch of 31 enemy properties spread across Uttar Pradesh were identified and listed for sale.

- Enemy property **refers to property or assets held or managed on behalf of an enemy subject or an enemy company.**
- To administer these properties, the **Enemy Property Act was enacted in 1968.**
- The law empowered the **Custodian of Enemy Properties in India (CEPI), under the Ministry of Home Affairs**, to manage and preserve the enemy properties.
- In **2017, The Enemy Property (Amendment and Validation) Act was enacted** which allows the transfer of enemy property from the enemy to other persons.

2) PMSVANidhi Scheme: Recently, PM SVANidhi achieved the target of covering 50 Lakh Street Vendors.

- It is a **Central Sector Scheme** i.e. fully funded by the Ministry of Housing and Urban Affairs.
- **Objective:**
  - to **facilitate a working capital loan** of up to Rs 10,000;
  - to incentivize regular repayment;
  - to **reward digital transactions**.
- **Salient Features:**
  - Loan tenure of 1 year on working capital.
  - **Interest Subsidy at 7% p.a**. on timely repayment, paid quarterly.
  - Monthly cash-back incentive on digital transactions.
  - Higher loan eligibility on timely/early repayment of the first loan.
  - **Covers urban local bodies** across the country.

3) National Investment and Infrastructure Fund (NIIF): NIIF has entered into a collaboration with the **Japan Bank for International Cooperation (JBIC) to unveil a $600 million India-Japan Fund.**

- The **fund will have JBIC and the Government of India as anchor investors.**
- **About NIIF.**
  - Anchored by the **Government of India**, it is a **collaborative investment platform for international and Indian investors.**
  - Three funds have been established by the Government under the NIIF platform: **Master Fund, Fund of Funds and Strategic Opportunities Fund.**
  - The **objective of the National Investment and Infrastructure Fund is to invest largely in equity and equity-linked instruments.**

4) Cape Town Convention (CTC): The Ministry of Corporate Affairs has notified that some provisions of the Insolvency and Bankruptcy Code (IBC) would not apply to aircraft, their engines, airframes, and helicopters.

- It will **make it easier to recover assets especially aircraft and engines even when an airline goes through insolvency.**
- With recent notification, the **Indian government has officially adopted the Cape Town Protocol & Convention**.
- This **Convention aims to achieve efficient financing of high-value mobile equipment,** like airframes, helicopters and engines.
- **India became a party to the convention in 2008.**

7.10.23

1) Cable Television Networks (Regulation) Act, 1955: The Ministry of Information and Broadcasting has notified amendments in the Cable Television Networks Rules, 1994.

- It provides the **operational mechanism for implementation of the decriminalized provisions of the Cable Television Networks (Regulation) Act, 1995.**
- **Aim**: to make the Cable Television Networks (Regulation) Act, of 1995 more **business-friendly** and to boost investor confidence and ease of doing business.
- Sections of the act were re-examined and were decriminalized through the **Jan Vishwas (Amendment of Provision) Act, 2023.**
- The imprisonment provisions have been now replaced with monetary penalties and other non-monetary measures like **Advisory, Warning, etc**.

2) Organization for Security and Cooperation in Europe (OSCE) Minsk Group: India supports the OSCE Minsk Group for a peaceful resolution of the conflict between Armenia and Azerbaijan over the Nagorno-Karabakh region.

- OSCE is the **world's largest regional security organization with 57 participating states**.
- Established in 1994, it is co-**chaired by France, Russia, and the United States.**
- Its permanent members are **Belarus, Germany, Italy, Sweden, Finland, and Turkey, as well as Armenia and Azerbaijan.**

3) India-UAE agreements: Agreements signed during a meeting of the UAE-India High-Level Joint Task Force (JTF) on Investments include:

- MoU for cooperation in the fields of **Industry and Advanced Technology** with a focus on seven key areas.
- **Agreement between Al Etihad Payments and NPCI International Payments Limited (NIPL)** to develop the UAE's Domestic Card Scheme (DCS).
- DCS solution provided by NIPL consists of a **RuPay stack and value-added services like fraud monitoring services and analytics.**
- JTF was established in 2013 to promote trade, investment and economic ties between both countries.

4) Services Purchasing Managers Index (PMI): Services PMI, grew to 13 year high in September according to S&P Global Market Intelligence.

- The growth in services in September was due to **effective marketing, favourable demand, and improved new businesses.**
- The **PMI is a survey-based indicator based on the responses of around 400 service companies released by S&P Global.**

9.10.23

1) Nobel Peace Prize: Narges Mohammadi, an Iranian women's rights advocate, won the 2023 Nobel Peace Prize.

- She was honoured for her fight against the oppression of women in Iran and for promoting human rights and freedom for all.
- The Nobel Peace Prize is the only Nobel Prize that is presented by the **chairman of the Norwegian Nobel Committee**; the other Nobel prizes are administered by the Nobel Foundation in Stockholm, Sweden.
- **Kailash Satyarthi (2014) and Mother Teresa** (1979) are Indian recipients of the peace prize.

2) Asia-Pacific Institute for Broadcasting Development: India was **re-elected as President of AIBD for a third successive term.**

- AIBD, headquartered in **Kuala Lumpur (Malaysia), was established in 1977** under the United Nations Educational, Scientific and Cultural Organisation (UNESCO).
- The **International Telecommunication Union (ITU), and UN Development Programme (UNDP)** are also its founding organisations.
- It has **26 Government Members** countries including India represented by their 48 broadcasting authorities.
- It envisages to achieve a vibrant electronic media environment in the region.
- **Functions:**
  - To **establish inter-regional links** and cooperation for media and communications development.
  - A **think-tank for the development of regional programming.**

3) Payment Infrastructure Development Fund (PIDF) scheme: RBI has extended the PIDF scheme by another two years. It will now include beneficiaries of the PM Vishwakarma scheme.

- It was **operationalised in 2021**.
- It will incentivise the deployment of payment acceptance infrastructure such as **physical Point of Sale (PoS), and Quick Response (QR) codes.**
- **Target Geographies:** In tier-3 to tier-6 centres, the northeastern states and Union Territories of Jammu & Kashmir and Ladakh.
- Beneficiaries of the PM SVANidhi Scheme in **Tier-1 and 2 centres were included**.

4) Permal Rice 126 (PR 126): The Punjab Government may ban the **PUSA variety in a push for the cultivation of the PR126 variety.**

- PUSA is **a long-duration variety (taking around 160 days to mature).**
- Short-duration PR 126 (crop cycle takes only 123 days) will help to conserve one month of irrigation water.
- It can **escape abiotic stresses and the incidence of pests and diseases**.
- It has a lower cost of cultivation and straw load is also lower.
- However, its average paddy yield is lower (~30 quintals/acre) than PUSA44 (~34-40 Quintals/acre).

10.10.23

1) Cotton: The Ministry of Textiles celebrates 'World Cotton Day' 2023.

- Cotton is a **Kharif crop and grows well in black cotton soil** (high water retention capacity) of the Deccan plateau.
- **Climatic conditions**
  - **Annual temperature requirement:** 20-28 degrees Celsius.
  - **Rainfall**: 55-110 cm is ideal.
  - **Minimum 180 frost-free days.**
  - **Cotton-producing states:** Maharashtra, Gujarat, MP, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Punjab, Haryana and UP.
- India grows all four species of cultivated cotton **Gossypium arboreum and herbaceum (Asian cotton), G. barbadense (Egyptian cotton) and G. hirsutum (American Upland cotton).**

2) Asiatic Wild Dog (Dhole): As per the study, overlapping prey availability or habitat suitability could dictate a positive association between dholes and tigers, facilitating co-existence between two species of carnivores.

- Sympatric refers to **animals, plant species, and populations within the same or overlapping geographical areas.**
- **About Asiatic Wild Dog Habitat:**
  - Wide variety of climates and habitats like **dense forests, scrub, steppes, and alpine regions**.
  - **Range**: Found in Central, South, East and Southeast Asia.
  - **IUCN status:** Endangered.
  - **Threats**: Habitat loss, declining prey availability, persecution, disease, and interspecific competition.

3) New Indian Air Force (IAF) Ensign: It was unveiled **as IAF marked its 91st anniversary**.

- The new ensign includes the **Air Force Crest in the top right corner**.
- IAF Crest has a national symbol, the Ashoka lion on the top with the words "**Satyamev Jayate" in Devanagari below it.**
- Below the Ashoka lion is a **Himalayan eagle** with its wings spread, denoting the fighting qualities of the IAF.
- A ring in light blue colour encircles a Himalayan eagle with the words "Bhartiya Vayu Sena".
- **IAF's motto, "Touching the sky with glory", is inspired by the Bhagavad Gita.**

4) Territorial Army (TA): TA inducted the **first batch of Mandarin (Chinese language)-trained officers along the Line of Actual Control.**

- TA, established under **the TA Act 1948, is a part of the Regular Army**.

- It **enables young citizens (18 to 42 years of age) to serve in a military environment** without having to sacrifice their primary professions.
- It relieves the Regular Army from static duties and assists the Civil Administration in dealing with natural calamities etc.
- TA personnel can be decorated for their gallantry services through **Kirti Chakra, Vir Chakra, Shourya Chakra, etc.**

11.10.23

1) Automatic 'Status Holder' certificates: The Ministry of Commerce & Industry unveils **system-based automatic 'Status Holder' certificates under Foreign Trade Policy 2023.**

- Now certificate will be provided by the IT system based on **available Directorate General of Commercial Intelligence and Statistics merchandise export electronic data and other risk parameters.**
- **Status Holders are business leaders who have excelled in international trade and have successfully contributed to the country's foreign trade.**
- Privileges of certificate.
- Provides credibility to the Indian exporters in the international markets.
- Priority custom clearances and certain exemptions (like exemption from compulsory negotiation of documents through banks).

2) District Mineral Foundation Funds: Rs. 82370.79 Crore collected under DMF till August 2023.

- DMF is **a trust, set up as a non-profit body established under the Mining and Minerals Development and Regulation (MMDR) Act, 2015** in all mining-affected districts.
- It **implements Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY)** from the DMF fund.
- Mining companies are required to contribute to DMFs between 10% and 30% of the royalty, in addition to the royalty paid to state governments.
- **About PMKKKY.**
  - **Objective**: developmental and welfare programs in mining-affected areas.
  - **Utilisation of funds:** 60% for high-priority works such as drinking water, health, education etc.

3) Kudumbashree: The "**Back to School" campaign was launched under Kudumbashree by the Kerala govt.**

- Under this, **46 lakh women will attend classes on adapting to the digital age, and training in financial transactions and entrepreneurship.**
- This will enable moving from poverty alleviation to enhancing the income of households.
- **Kudumbashree is the poverty eradication and women empowerment programme of Kerala.**
- It is essentially a community network that covers the entire State of Kerala.

4) SHRESHTA Scheme: Till now in FY 2023-24 the expenditure under SHRESHTA (Residential Education for Students in High Schools in Targeted Areas) is Rs. 14.94 cr.

- **Ministry**: Ministry for Social Justice and Empowerment.
- **Type**: Central Sector Scheme.
- **Objective**: To **fill the gap in service-deprived SCs (Scheduled Castes) dominant areas, provide an environment for the socio-economic upliftment of SCs, etc.**
- **Benefits**: High-quality free residential education to poor and meritorious scheduled caste (SC) students from class 9th to class 12th.
- **Implementing agency.**
- **Mode 1:** District Administration.
- **Mode 2:** Voluntary organisation (VO)/ Non-Government Organisation (NGO)/other organisation.

12.10.23

1) 'A-HELP' (Accredited Agent for Health and Extension of Livestock Production) Programme: The Department of Animal Husbandry and Dairying (DAHD), Government of India launched the 'A-HELP' programme at Jharkhand.

- **MoU was signed between DAHD and the National Rural Livelihoods Mission under the Ministry of Rural Development to launch the programme.**
- Aims to empower women by engaging them as **trained agents who contribute significantly to disease control, animal tagging, and livestock insurance.**
- It enhances access to veterinary services at the farmer's doorstep and empowers Pashu Sakhis.

2) IRDAI issued Bima Vahak guidelines (BHG): The guidelines **aim to establish women women-centric distribution channel that focuses on enhancing insurance inclusion and awareness in every village.**

- It **also aims to improve the accessibility and availability of insurance** in every nook and corner of the country.
- The scope of work of Bima Vahaks, besides creating awareness of insurance in villages, is likely to range from filling out proposal forms, facilitating the KYC process for customers, issuance of insurance policies, etc.

- It is a **part of IRDAI's strategy to achieve its 'Insurance for All goal'.**

3) UN Human Rights Council (UNHRC): Russia fails to re-join UNHRC and 15 new countries including Albania, Brazil, China, France, and Japan, were elected to serve.

- **UNHRC was created in 2006 as an intergovernmental body within the UN**, responsible for the promotion and protection of human rights around the globe.
- It is **made up of 47 Members,** elected by the UN General Assembly through direct and secret ballot.
- The **Membership is based on equitable geographical distribution and Seats are distributed among 5 regions**.
- Selected Members serve for a period of three years and are not eligible for immediate re-election after serving two consecutive terms.
- **India is currently a council member.**

4) Natural Gas demand on the rise: According to the International Energy Agency report, India's natural gas demand is to rise by 4% in 2023 and rise at an average annual rate of over 8 per cent till 2026.

- The growth in demand will be primarily supported by the **power, petrochemical and fertiliser sectors.**
- The government aims to raise the share of gas in its energy consumption mix to 15 per cent by 2030.
- **The country currently imports about 50 per cent of its gas requirements.**

13.10.23

1) Osiris-Rex spacecraft (Origins, Spectral Interpretation, Resource Identification, and Security-Regolith Explorer): NASA showed its first asteroid samples delivered last month by Osiris-Rex spacecraft.

- These samples are expected to offer clues to whether asteroids colliding with Earth billions of years ago brought water and other key ingredients for life.
- **OSIRIS-Rex is the first U.S. mission to collect a sample from an asteroid.**
- It collected samples from the **near-Earth asteroid Bennu.**
- This mission will help scientists investigate how planets formed and how life began, as well as improve our understanding of asteroids that could impact Earth.

2) 'One CGIAR' Global Initiative: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) joins **One Consultative Group on International Agricultural Research (CGIAR) global initiative.**

- ICRISAT is an **international research institute with a focus on tropical dryland agrifood system innovation.**
- ICRISAT in India is **one of CGIAR's research centres**.
- One CGIAR is a reformulation of CGIAR's partnerships, and global presence, aiming for greater integration and impact in the face of global challenges.
- **CGIAR is a publicly-funded network of agrifood systems research centers, established in 1971**.
- **Aims:** build a unified approach to transforming food, land, and water systems to address the challenges of the climate crisis.
- **Project of Climate Change, Agriculture and Food Security (CCAFS), an international research program**, is carried out under a consultative group on CGIAR headquartered in France.

3) Lakadong Turmeric: Padma Shri award winner Saioo is known as "Turmeric Trinity" because she made the Meghalaya Lakadong Turmeric famous through her tireless work.

- Cultivated in the black alluvial soil during the monsoon months in **Lakadong, Jaintia Hills.**
- 3 times more potent than regular turmeric and has 7 to 12% of curcumin content.
- It was **brought under the "One District One Product" scheme** in the West Jaintia Hills district.
- She has now planned to promote 'Makhir' ginger.
- **Makhir is one of the two types of ginger popular in Meghalaya** (the other one being 'Nadia' ginger) having unique pungency and medicinal properties.

4) Baltic connector pipeline: A subsea gas pipeline and telecommunications cable connecting **Finland and Estonia under the Baltic Sea have been damaged.**

- The baltic connector pipeline connects **Inkoo in Finland with Paldiski in Estonia**, running across the Gulf of Finland in the Baltic Sea.
- The **Baltic Sea is the arm of the North Atlantic Ocean**, extending northward from southern Denmark almost to the Arctic Circle.
- It **separates the Scandinavian Peninsula from the rest of continental Europe**.

14.10.23

1) Passport to Earning (P2E) Initiative: More than one million young people in India are **certified through UNICEF's P2E Initiative in areas of financial literacy and digital productivity.**

- Notably, 62 per cent of all young learners who benefitted from P2E courses in India are adolescent girls and young women.
- **P2E is an e-learning solution that empowers youth with relevant skills and abilities to thrive.**
- It **aims to deliver long-term sustainable skilling to 5 million youth in the age group of 14-29 in India by 2024.**
- It is **aligned with National Education Policy 2020.**
- P2E solution offers provisions for online, hybrid, and offline learning models.

2) Pontus Tectonic Plate: A long-lost tectonic plate named 'Pontus' was discovered in Borneo.

- It disappeared 20 million years ago.
- **Location**: Present-day South China Sea.
- Early Movement shrank steadily over its lifespan, finally getting pushed under the Australian plate to the south and China to the north.
- **Significance**: revealed **planet's paleogeography and climate have changed over time etc.**

3) National Mission for Clean Ganga (NMCG): The Executive Committee of NMCG has approved seven projects.

- **NMCG was registered as a society in 2011 under the Societies Registration Act 1860.**
- It **acted as the implementation arm of the National Ganga River Basin Authority (NGRBA) which was constituted under provisions of the Environment (Protection) Act, 1986.**
- **Nodal Ministry:** Ministry of Jal Shakti.
- **Objective of NMCG.**
    - Ensure **effective abatement of pollution and rejuvenation of river Ganga** by adopting a river basin approach.
    - Maintain minimum ecological flows in the river to ensure its water quality and sustainability.
    - **NMCG has a two-tier management structure and comprises of Governing Council and an Executive Committee.** Both of them are headed by the Director General of NMCG.

4) Data Analytics Dashboard and Poorvottar Sampark Setu Portal: The Ministry of Development of North Eastern Region (DoNER) has launched two portals viz:

- **DoNER Data Analytics Dashboard:** has data on 112 schemes across 55 Departments and Ministries,
- Will help in **Data-driven decision-making;** Ease of operations; Centralized monitoring, etc.
- **Poorvottar Sampark Setu portal: generates a curated list of Ministers who can be nominated for a fortnightly visit of Union Ministers to Northeast region.**

15.10.23

1) Dampa Tiger Reserve: A new species of toad (Frog) – **Bufoides bhupathyi found in the Dampa tiger reserve.**

- **Location**: western flank (Lushai Hills) of Mizoram.
- On the West, it is bound by the **Chittagong hill tracts (Sazek hill range) of Bangladesh**.
- **In 1994, it was declared a tiger reserve under the Project Tiger initiative.**
- **River**: drained by the **River Khawthlangtuipui** to the West and the **Teirei River** to the East.
- **Flora**: ranges from tropical evergreen to semi-evergreen forests.
- **Fauna**: Hoolock Gibbon, Tiger, Leopard, Clouded Leopard, Golden Cat, Himalayan Black Bear etc.

2) Vizhinjam port: The under-construction Vizhinjam International Seaport receives its first ship.

- It will be the **country's first deepwater container transhipment terminal.**
- Location near **Thiruvananthapuram in Kerala**.
- It is being built on a **public-private partnership (PPP) mode set to be completed in 2024.**
- **Significance**.
    - Proximity to international shipping routes connecting Europe, the Gulf and East Asia.
    - Located on minimal littoral drift resulting in limited maintenance dredging.
    - Ideal location for fuel bunkering.

3) Inter-Parliamentary Forum (IPU): Ninth P20 Summit hosted by the Parliament of India in cooperation with IPU in New Delhi.

- The P20 Summit is an **annual gathering of G20 Parliament Speakers discussing global issues.**
- **Genesis**: Established in 1889 as a small group of parliamentarians.
- **About**: the global organization of national parliaments that facilitates parliamentary diplomacy.
- **Objective**: Parliamentary ecosystems for Democracy, for everyone: Building **effective, inclusive, resilient and innovative parliaments**.
- **Membership**: 179 Members (Including India) and 14 Associate Members.

4) Navratna status: Ircon International Limited (IRCON) and RITES Ltd, both Central Public Sector Enterprise under the Ministry of Railways, have been granted Navratna Status.

- **'Navratna Company has the authority to invest up to Rs 1,000 crore without explicit government approval.**
- The status of Navratna is granted based on various parameters, such as:
    - CPSEs which are **Miniratna I,** and
    - Have obtained '**excellent' or 'very good' MoU rating in three of the last five years** and

- Having a composite score of 60 or above in selected performance indicators.
- The **status is conferred by the Ministry of Finance.**

17.10.23

1) Multinational Security Support (MSS): The United Nations Security Council (UNSC) has approved a **Kenya-led multinational security mission to Haiti.**

- MSS will help to secure **critical infrastructure and transit hubs** such as airports, ports, schools, hospitals etc.
- The resolution, adopted under the **UN Charter was penned by US and Ecuador**.
- UN Charter sets out the UNSC's responsibilities to maintain international peace and security.
- **MSS will not be operated by the United Nations.**
- Countries like the **Bahamas, Jamaica Antigua and Barbuda** have also offered support to implement it.

2) Jageshwar Temple and Parvati Kund: The Prime Minister visited Jageshwar temple and Parvati Kund in Uttarakhand.

- **Jageshwar temple is located near the river Jata Ganga**. The main temple of Shiva is covered by more than 100 small ancient temples of different gods.
- **Temples belong to post-Gupta and pre-medieval eras** (mostly built and renovated by Katyuri dynasty kings).
- According to **Skandha Purana and Linga Purana** worship of lord Shiva was started from Jageshwar.
- This area was also the centre of **Lakulisha Shaivism**, a revivalist sect worshipping Lord Shiva.
- **Parvati Kund** at an elevation of about 5,338 feet is believed to be the site where **Lord Shiva and Goddess Parvati meditated.**

3) David Sling Air Defence System: Israel used David's Sling air defence system to intercept Hamas rockets.

- **David's Sling system includes a missile firing unit, a fire control radar, a battle management station, and an interceptor.**
- It is a long-range air and missile defence system.
- **Benefits**: Designed for "plug and play" insertion into fielded air and missile defence systems – open architecture.
- Next-generation multi-sensor seeker.
- **Cost-effective.**

4) Hepatitis C: According to WHO, **Egypt became the first country to achieve "gold tier" status on the path to elimination of hepatitis C.**

- Hepatitis C is a **viral infection that affects the liver**. It can cause both acute (short-term) and chronic (long-term) illness.
- **Transmission**: Reuse or inadequate sterilization of medical equipment, especially syringes and needles in healthcare settings.
- There is **no vaccine for hepatitis C**, but it can be treated with antiviral medications.
- Whereas, effective vaccines are available for Hepatitis A and B.

18.10.23

1) 2+2 dialogue: India and the UK held their first 2+2 dialogue.

- It is a **format of meeting on the foreign and defence aspects by India and its allies on strategic and security issues.**
- It involves discussion either at the level of senior officials or ministers.
- It enables the partners to better understand and appreciate each other's strategic concerns and sensitivities while building a strategic relationship.
- India has already established 2+2 dialogues with the **US, Australia, Japan, and Russia**.

2) Indian rupee valuation: The Indian Rupee depreciated against the US dollar to a record new low of ₹83.27 to a US dollar.

- **Rising Crude Oil Prices and Weakness in other Asian Currencies are attributed to be the reason for the current trend.**
- **Other reasons for depreciation:** trade imbalances, budget deficits, inflation, global fuel prices, economic crises, etc.
- **Effects of weak rupee:** It will increase the cost of imports, inflation, increase in liabilities for companies with overseas debts, valuation loss of forex reserves, etc.

3) Tilapia parvovirus: India's first tilapia parvovirus was reported in Tamil Nadu.

- It is affecting **farm-bred tilapia, a freshwater fish species**, and causing a huge mortality rate.
- **Mozambique tilapia was introduced to Indian freshwater bodies in the 1950s.**
- Capable of surviving in low-oxygen levels in water, the fish has turned invasive across the country.
- **Tilapia parvovirus (TiPV) is a single-stranded DNA virus**.
- The discovery of TiPV in India is the **third known occurrence after China (2019) and Thailand (2021).**
- Currently, no vaccine is available against TiPV.

4) Ayushman Bhav Campaign: Initiative of Ministry of Health and Family Welfare.

- **Objective**: To extend comprehensive healthcare coverage to every village and town.
  It has 3 components:
- **Ayushman Apke Dwar 3.0:** To provide Ayushman cards to remaining eligible beneficiaries enrolled under the PM-JAY scheme.
- **Ayushman Melas:** To facilitate the creation of Health IDs and issuance of Ayushman Bharat Cards.
- **Ayushman Sabhas**: To raise awareness about vital health schemes and disease conditions.
- NGOs, SHGs, PRIs, Youth groups, Primary cooperative societies, Indian Medical Association and companies using CSR funds, will be part of the campaign.

19.10.23

1) Mount Vesuvius: Researchers used an AI program to read from an ancient scroll that was burned by the eruption of Mount Vesuvius.

- It is **one of the active volcanoes on Europe's mainland.**
- **Location**: Naples, Italy.
- It is a **composite stratovolcano**, made up of pyroclastic flows, lava flows, and debris from lahars.
- Stratovolcanoes have steep sides and are more cone-shaped.
- The **mountain has had eight major eruptions in the past 17,000 years, most recent in 1944.**
- Its most famous eruption, in A.D. 79, destroyed the cities of **Pompeii and Herculaneum**.

2) Central Road and Infrastructure Fund (CRIF): Various bridge projects were recently approved in Arunachal under the **Setu Bandhan Scheme under the Central Road and Infrastructure Fund (CRIF).**

- Setu Bandhan Scheme **aims to build Road Over Bridges (ROBs)/Rail Under Bridges (RUBs)/Bridges over the State Roads.**
- CIRF is fund earmarked for various infrastructure sectors such as **Transport (Road and Bridges, Ports, etc), Energy, Water and Sanitation, etc., as per the provisions of CRIF Act, 2000.**
- CRIF gets funds by way of cess, a duty of excise and a duty of customs on motor spirit commonly known as petrol, high-speed diesel oil etc.

3) Use of Bamboo to prevent landslides: The Kerala Forest Department is planning to plant bamboo and creeper bamboo along the highway in Munnar to prevent repeated landslides.

- In **2017, the Government amended the Indian Forest Act to categorise bamboo as grass.**
- Now there is no prohibition on growing or cutting bamboo trees even outside the forests.
- **Bamboo grows four to five feet deep into the soil and ensures strong protection of the soil.**
- Using bamboo to prevent landslides has been found successful in countries like **Malaysia, the Philippines and Nepal.**

4) Leniency plus: The Competition Commission of India (CCI) recently issued a draft of '**leniency plus' norms to curb Cartelization.**

- Cartelization is when enterprises come together illegally to fix prices, indulge in bid rigging, or share customers, etc.
- Under **'Leniency Plus', a cartel can disclose the existence of another cartel in an unrelated market in exchange for a reduction in penalty for original leniency proceedings.**
- The "**Leniency Plus" regime was part of the Competition (Amendment) Act 2023.**
- It is expected to further incentivise applicants to come forward with disclosures regarding multiple cartels to curb cartelisation.

20.10.23

1) Yuva Sangam: Modelled on Kashi Tamil Sangamam, Yuva Sangam is an initiative by the Government of India under the Ek Bharat Shreshtha Bharat.

- It **aims to strengthen people-to-people connections between youth belonging to different States/UTs of India.**
- Youths across various states will visit other states for 5-7 days.
- Multi-dimensional exposure will be provided under five broad areas - **Paryatan (Tourism), Parampara (Traditions), Pragati (Development), Paraspar Sampark (People-to-people connect), and Prodyogiki (Technology).**
- It draws inspiration from the **National Education Policy 2020 and focuses on experiential learning.**

2) RISUG (Reversible Inhibition of Sperm under Guidance): The Indian Council of Medical Research (ICMR) has concluded a seven-year study on the male contraceptive RISUG, finding it to be safe and effective.

- RISUG is a **non-hormonal injectable contraceptive** that provides long-lasting sterility with complete reversibility.
- The study found that **RISUG's pregnancy prevention was 99.02%** without any serious side effects.
- Contraception is defined as the intentional prevention of conception through the use of various devices, sexual practices, chemicals, drugs, or surgical procedures.

3) Intra-State Transmission System Green Energy Corridor (InSTS GEC): The Cabinet approved the InSTS

GEC Phase II for the 13 GW Renewable Energy Project in Ladakh.

- **Power Grid Corporation of India Limited will be the Implementing Agency for this project**.
- This project is in addition to **InSTS GEC Phase-II, which is already under implementation in the States of Gujarat, Himachal Pradesh, Karnataka, Kerala, Rajasthan, Tamil Nadu and Uttar Pradesh** for grid integration and power evacuation of approx. 20 GW of RE power.
- It is **expected to be completed by 2026**.

4) Marsquake: Marsquake is a quake or tremor on the surface of Mars, much like the tremors caused by earthquakes on the Earth.

- NASA's InSight lander in 2022 detected the **strongest Marsquake which was caused by the tectonic forces within Mars.**
- The Earth's crust is divided into tectonic plates that continually shift, triggering quakes but the **Martian crust is a single solid plate.**
- Mars is still slowly shrinking and cooling, and there is still motion within the crust even though there are no active plate tectonic processes. **These faults can trigger quakes**.

21.10.23

1) Double Taxation Avoidance Agreement (DTAA): The Supreme Court held that DTAA cannot be given effect unless notified under the Income Tax Act.

- **Section 90 of the Income Tax Act** prescribes tax relief under the DTAA.
- DTAA is a **tax treaty signed between two or more countries**.
- Its objective is that **tax-payers in these countries can avoid being taxed twice for the same income.**
- It applies in cases where a tax-payer resides in one country and earns income in another.

2) "Chakra-II" operation: CBI recently searched many locations under **"Chakra-II" operation.**

- It is **aimed at combating and dismantling the infrastructure of organized cyber-enabled financial crimes in India.**
- CBI conducted it jointly with national and international agencies and private sector giants.
- **Chakra-1 was conducted by the CBI in coordination with the Interpol, the FBI and police forces of multiple countries.**

3) Traditional attar production: Kannauj is known for its traditional attar production, with a rich heritage dating back centuries.

- Attar is a **fragrant liquid made from flower and herb extracts**.
- Kannauj is a significant hub for the fragrance and flavour industry in India, contributing to the country's exports. Hence, it is **known as Perfume City**.
- **India is the world's largest exporter of attar.**
- **Kannauj Perfume has also received a GI Tag.**

4) Little Ice Age (LIA): A recent study showed the record of moist conditions during LIA from Western Ghats, India.

- **LIC was one of the coldest periods of the past 10,000 years**, a period of cooling that was particularly pronounced in the North Atlantic region.
- It is **attributed to a period between the 16th and 19th centuries.**
- This cold spell was said to be responsible for **crop failures, famines and pandemics** throughout Europe, resulting in misery and death for millions.
- LIA is attributed to a combination of cooling from volcanic aerosols and low solar activity producing lower surface temperatures.

23.10.23

1) INS Imphal: The Indian Navy received INS Imphal, the **first warship with separate accommodation for women sailors.**

- INS Imphal is the third ship (after INS Visakhapatnam and INS Mormugao) of **Project 15B Class of stealth-guided missile destroyers.**
- It was built by **Mazagon Dock Shipbuilders Limited.**
- It is armed with **supersonic Surface-to-Surface 'Brahmos missiles and 'Barak-8' Medium Range Surface Air Missiles.**
- **Project 15B is a follow-on of the Kolkata class** (Project 15A) destroyers commissioned in the last decade.
- Indigenous content in P15B Class Destroyers is 72% (P15A had 59% and P15 had 42%).

2) Graphite: China imposes export curbs on graphite.

- **China is the world's top graphite producer and exporter.**
- It refines over 90% of the world's graphite for Electric Vehicle battery anodes.
- Graphite (plumbago or black lead) is a naturally occurring form of crystalline carbon.

  Types:
- **Natural**- High crystalline, Amorphous and Flake.
- **Synthetic**: produced from coke and pith.
- **Features:**
  1. One of the common allotropes of carbon.
  2. Good conductor of heat and electricity.
- **Applications:** used in pencils, lubricants, polishes, batteries, cores of nuclear reactors etc.

3) Vienna Convention on Diplomatic Relations 1961 (Vienna Convention): India reiterated that seeking parity in mutual diplomatic presence with Canada in accordance with the Vienna Convention.

- Vienna Convention provides a complete framework for the establishment, maintenance and termination of diplomatic relations between independent sovereign States.
- It specifies functions privileges and immunities of diplomatic missions, rules regulating appointments, etc.
- **Article 11.1 pertains to the size of international missions within other countries.**
- It was **signed in 1961 and entered into force in 1964.**
- It has **60 signatories** including India and 193 parties.

4) Indian Institute of Corporate Affairs (IICA): IICA and Skill Council for Persons with Disability (SCPWD) signed a MoU for '**Job Coach for Inclusivity Programmes'.**

- **Aim**: equipping corporates in terms of knowledge, skills, and competencies for building and managing a diverse workforce.
- IICA is an **autonomous body under the Ministry of Corporate Affairs.**
- It **acts as a think-tank and a Centre of Excellence** to support the growth of the corporate sector in India through an integrated and multi-disciplinary approach.
- It was **registered as a society in 2008 under the Societies Registration Act, 1860.**

24.10.23

1) Project UDBHAV: 'Project UDBHAV' was launched during the inauguration of the **Indian Military Heritage Festival.**

- It is a collaborative project between the **Indian Army and the United Service Institution of India (USI), a think tank.**
- **Objective**: To synthesize ancient wisdom with contemporary military practices for modern security challenges.
- The ancient Indian knowledge system related to war includes **Chanakya's Arthashastra (strategic partnerships, diplomacy, soft power projections, etc.) and Thirukkural (Ethical conduct in warfare).**
- **Thirukkural is a Tamil text by Thiruvalluvar.**

2) Cyber insurance: A recent report suggested that **Cyber insurance is critical for Micro, Small and Medium Enterprises (MSMEs) as they are more susceptible to cyberattacks.**

- Cyber insurance is a contract that an entity can purchase to help reduce the financial risks associated with doing business online.

Benefits:

- Coverage for business interruption, compensating for lost income.
- Experts' access who can manage and mitigate the impact of a cyber-incident.
- Financial security against damages.
- Provides cover for legal assistance.
- Provides for reputation management and helps businesses rebuild trust.

3) Kasturi Cotton Bharat: The website of "Kasturi Cotton Bharat" has been launched.

- It is the **1st ever Brand and logo for Indian Cotton.**
- It is a **joint initiative by the Ministry of Textiles, the Cotton Corporation of India, and Trade Bodies & Industry.**
- **Objective**: Creating premium value for cotton grown in India as per benchmarked specifications.
- It will promote exports by enhancing the international perception & valuation of Indian Cotton.

4) Paintbrush Swift Butterfly: Paintbrush swift butterfly (Baoris farri) has been documented for the first time in Himachal Pradesh's Chamba district.

- **Family**: Hesperiidae family, discovered in 1878.
- **Habitat**: Common in northeast, central and south India, and rare in Uttarakhand.
- **Key Feature**: It is identified by two separated spots in the upper forewing cell.
- The species' larvae feed on bamboo and some other grass species.

26.10.23

1) Unlawful Activities (Prevention) Tribunal: The Centre constituted a tribunal for adjudicating the matter under the Unlawful Activities (Prevention) Act, 1967.

- **Constituted by the Central Government** to confirm a ban on an organization.
- The tribunal is made up of a **High Court judge appointed by the Central Government**.
- Under **Section 4 of the UAPA**, if an association is deemed unlawful, the Centre has to refer it to a tribunal within 30 days. The tribunal then decides if there's enough reason for the unlawful label.
- It has the **powers of a civil court** and regulates its own procedure.

2) Indo-Tibetan Border Police (ITBP): ITBP celebrates its raising day.

- ITBP is a **specialized Armed Police Force established in 1962.**

- It is **one of the 7 Central Armed Police Forces (CAPFs).**
- **6 remaining CAPFs:** Sashastra Seema Bal, Border Security Force, Central Reserve Police Force, Central Industrial Security Force, National Security Guard, and Assam rifles.
- It is **backed by the ITBPF Act, of 1992, and rules framed in 1994.**
- It trains its personnel in various disciplines including mountaineering and skiing apart from intensive tactical training.

3) Exercise Harimau Shakti-2023: It is a joint bilateral training exercise of the Indian & Malaysian Army.

4) National Cooperative Exports Limited (NCEL): The logo, website and brochure of NCEL launched.
- NCEL was established as an **umbrella organisation for cooperative sector exports in January 2023.**
- It was registered under the **Multi-State Co-operative Societies Act, 2002.**
- Its objectives include **increasing exports, making farmers prosperous, providing a global market** for organic products, gaining a place for India in the global market for biofuel etc.
- All cooperative societies who are interested in exports are eligible to become members of NCEL.

27.10.23

1) Tribal Cooperative Marketing Development Federation of India (TRIFED):
- **Genesis**: Established in 1987 under the Multi-State Cooperative Societies Act, 1984.
- **About**: National-level cooperative body under the administrative control of the Ministry of Tribal Affairs.
- **Scheme**: PM Van Dhan Yojana.
- **Objective**: Socio-economic development of tribal people in the country by way of marketing development of tribal products.
- **Function**: institutionalizing the trade of Minor Forest Produce and surplus Agricultural Produce (SAP) collected/ cultivated by tribals.

2) Asian Development Bank (ADB): ADB has approved a $400 million policy-based loan to India for the Sustainable Urban Development and Service Delivery Program which aims to improve access to basic urban services in India.
- **Genesis**: Established in 1966 after a resolution was passed at the **first Ministerial Conference on Asian Economic Cooperation held by the UN Economic Commission for Asia and the Far East in 1963.**
- **About**: It envisions a prosperous, inclusive, resilient, and sustainable Asia and Pacific while sustaining its efforts to eradicate extreme poverty in the region.
- **Members**: 68 members (49 are from within Asia and the Pacific). India is a member.
- **Other Key Information:**
- **ADB's highest policy-making body is the Board of Governors.**
- ADB's five largest shareholders are **Japan, the United States, and the People's Republic of China, India, and Australia.**

3) Vienna Convention on Diplomatic Relations (VCDR): New Zealand criticized India's demand for 41 Canadian diplomats to leave referring to VCDR.
- The **Convention was signed in 1961 and currently has 193 parties to it.**
- India ratified the convention in 1965.
- **Aim**: to ensure the 'development of friendly relations among nations'.
- It puts forth a framework for diplomatic interactions between nations.
- **Key provisions:**
  - It specifies the functions of diplomatic missions.
  - **Lists Special rules on immunities and privileges** accorded to diplomats and their missions.
  - Guarantees free communication between a mission and its sending State.

4) Pradhan Mantri Krishi Sinchayee Yojana-Accelerated Irrigation Benefit Programme (PMKSY-AIBP): The Cabinet Committee on Economic Affairs has approved the inclusion **of Jamrani Dam Multipurpose Project of Uttarakhand under PMKSYAIBP.**
- It envisages the construction of a dam across river Gaula (a tributary of river Ramganga).
- **PMKSY, launched in 2015-16, is a Centrally Sponsored Scheme under the Ministry of Agriculture and Farmers Welfare.**
- **Objective**: To expand cultivable area under assured irrigation, improve on-farm water use efficiency, etc.
- **PMKSY Components:**
  - **AIBP component** (Ministry of Jal Shakti) provides central assistance to major/ medium irrigation projects.
  - **Har Khet ko Pani** (Ministry of Jal Shakti).
  - **Per Drop More Crop** (Ministry of Agriculture & Farmers Welfare).
  - **Integrated Watershed Management Programme** (Ministry of Rural Development).

28.10.23

1) Credit Information Companies (CICs): RBI has directed CICs to introduce a compensation framework for delays in updating or rectification of credit information of borrowers.

- A CIC shall pay compensation to the complainant if the complaint cannot be resolved within 30 days.
- **CICs maintain credit information of borrowers which can be accessed by banks and other lenders**.
- They **collect information from banks, credit card companies and non-bank financial institutions.**
- Lending institutions refer to CIC's credit reports to decide borrowers' creditworthiness.
- **CICs are licensed by RBI.**

2) Reference Fuels: Indian Oil Corporation Limited launched **India's first gasoline and diesel Reference Fuel (RF).**

- Currently, reference fuels are being imported by India.
- RFs are **premium high-value products, used for calibration and testing of vehicles by Auto Original Equipment Manufacturers and organizations** involved in testing and certification in the automotive field.
- Specification requirements of RF are more stringent than commercial gasoline and diesel.
- Indigenous RF meets Automotive Industry Standard specifications and is available at a better price with reduced lead time.

3) National Medicinal Plants Board (NMPB): Under the 'Ayurveda for One Health' campaign, farmers are being sensitized about special techniques used in the cultivation of medicinal plants through NMPB.

- **'One Health'** is an integrated, unifying approach to balance and optimize the health of people, animals and the environment.
- **NMPB, set up in 2000 to promote the medicinal plants sector**, is working as a section of the Ministry of AYUSH.
- It is mandated to develop an appropriate mechanism for coordination between various ministries and implement policies for the overall growth of the medicinal plants sector.

4) Anamalai Tiger Reserve (ATR): It is carved out of the Tamil Nadu portion of the Anamalais and lies south of the Palakkad gap in the Western Ghats.

- It is surrounded by **Parambikulum Tiger Reserve on the East, Chinnar Wildlife Sanctuary and Eravikulum National Park on the South Western side.**
- The Kariyan shola, Grass hills and Manjampatti of ATR are part of the UNESCO world heritage site Western Ghats.
- It supports 6 indigenous people viz. **Malasar, Malai Malasars, Kadars, Eravallars, Pulayars and Muduvars**.
- **Flora**: Balsam, Orchids and Kurinchi.
- **Fauna**: Bengal Tiger, Indian Elephant, Nilgiri Tahr, Gaur etc.

30.10.23

1) Air Transport Circular (ATC): Air Transport Circular ATC 01 of 2021 allows charging for "preferential" seats.

- ATC 01 of 2021 allowed unbundling of services since not all services are availed by every traveller and unbundling could reduce the basic airfare.
- It led to the **application of preferential charges for preferred seats**, food and drinks (except water), baggage, etc.
- However, since there is no cap on the number of seats that can be under preferential charge even the middle seats (typically not the preferred) are also charged.
- **ATCs are issued and revised by the Directorate General of Civil Aviation.**

2) Cardamom: North-East monsoon revives hopes of cardamom growers.

- **Cardamom** (Queen of Spices) is native to tropical areas of **India, Burma, and Sri Lanka**.
- Commonly found in evergreen rainy forests of the Western Ghats in South India (Kerala, Karnataka and Tamil Nadu).
- Contains **vitamin C, niacin, magnesium, and potassium.**
- **Type**: Herbaceous, evergreen perennial of the ginger family.
- **Soil**: Forest loamy soils which are usually acidic in nature with a pH range of 5.0 – 6.5.
- **Annual rainfall ranges:** from 1500 to 4000 mm.
- **Temperature range:** 10 to 35 degrees C.
- **Uses**: Food flavouring, Beverages, Perfumes, Medicines, Cosmetics etc.

3) Coal Ministry, MNRE collaborate for green energy expansion: The Ministry of Coal (MoC) and Ministry of New & Renewable Energy (MNRE) will jointly promote Green Energy expansion.

- MoC will provide **land, and capital and undertake implementation of renewable energy projects.**
- De-coaled (Lands from which coal has been mined out) surplus land masses of Coal companies can be offered for setting up of green hydrogen projects by the private investors.
- MNRE will support the **MoC and its CPSEs** in capacity-building training of engineers, technicians and other functionaries through the **National Institute of Solar Energy (NISE).**

4) Pliosaur: Fossils of a 170-million-year-old ancient marine reptile from the Age of Dinosaurs have been identified as the oldest-known megapredatory Pliosaur.

- Pliosaurs were a **group of ocean-dwelling reptiles with short necks and massive skulls.**
- They appeared over 200 million years ago but remained minor components of marine ecosystems until suddenly developed into enormous apex predators.
- **Lorrainosaurus is the oldest large-bodied pliosaur represented by an associated skeleton.**

31.10.23

1) Science & Technology Clusters (STCs): The Principal Scientific Adviser (PSA) to the Government of India Chaired the first joint meeting of STC.

- Launched in 2020, it is a **flagship initiative of the Office of the PSA.**
- These are established as **formal umbrella structures for S&T organizations** in various cities for better synergy while retaining autonomy.
- It will create strong linkages between academic institutions, research laboratories, and other stakeholders.
- **The Office of the PSA was placed under the Cabinet Secretariat in August 2018.**

2) Panamalai Paintings (Tamil Nadu): 1,300-year-old paintings at Talagirishwara temple are fading, as per reports.

- The painting shows Lord Shiva with eight hands dancing, known as **Latathilagabhani**, being watched by Goddess Parvathi.
- These mural paintings were created after covering stonewalls with a paste made of limestone and sand.
- The paintings bear a close resemblance to paintings in **Ajantha and Chithannavasal.**
- The temple was constructed by **Pallava king Narasimhavarman II, popularly known as Rajasimha.**
- **Rajasimha's Sanskrit epigraphs are found here.**

3) Seismic/ Earthquake Swarms: Iceland has been hit by more than 5500 small earthquakes.

- These are sequences of many earthquakes that occur in a relatively short period without a specific main shock.
- It can last weeks and produce many thousands of earthquakes within a relatively small volume.
- These are **observed in volcanic environments, hydrothermal systems, and other active geothermal areas**.
- **Iceland is Europe's largest and most active volcanic region due to its presence on the Mid-Atlantic Ridge.**

4) Norman Pritchard (First Olympic medallist for India): India took part in its **first-ever modern Olympic Games during the second edition of the Summer Olympic Games held in Paris in 1900.**

- **Norman Pritchard was the only athlete representing India at the Olympic Games in 1900** who competed in the Men's 200-meter and 200-meter hurdles.
- He finished second in both events and won India its first medals ever in Olympic Games history.
- However, he is considered a "controversial" Olympian as he is claimed by both Britain and India.

3.10.23

1. **AUKUS:** As part of the AUKUS initiative with Australia and the US, the UK has given three UK businesses a 4 billion pound ($4.9 billion) contract to design and build an attack submarine powered by nuclear energy. **Established in 2021, the AUKUS is intended to be a strategic partnership among Australia, the United Kingdom (UK), and the United States to bolster their allied deterrence and defence capabilities in the Indo-Pacific.** The trilateral partnership, which builds on their decades-long security cooperation, has two pillars. **Pillar I** revolves around the **acquisition and development of conventionally armed nuclear-powered submarines** for the Royal Australian Navy; **Pillar II** calls for collaboration on **advanced capabilities that will involve technology and information sharing.**

2. **R21/Matrix-M Vaccine:** 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. WHO is now reviewing the vaccine for prequalification, which is the WHO stamp of approval, and will enable GAVI (a global vaccine alliance) and UNICEF to buy the vaccine from manufacturers. It is a n**ew vaccine approved for the prevention of malaria in children. It was developed by the University of Oxford and the Serum Institute of India** with support from the European and Developing Countries Clinical Trials Partnership ('EDCTP'), the Welcome Trust, and the European Investment Bank ('EIB'). It is the **first malaria vaccine to reach the WHO's target of 75% efficacy**. It has already been approved for use in **Burkina Faso, Ghana, and Nigeria**. The vaccine will be rolled out in those African countries in early 2024 and will be available in mid-2024 in other countries.

3. **Sanwariya Seth Temple:** It is a Hindu temple dedicated to Lord Krishna, specifically to his beloved child form known as "**Sanwariya Seth" or "Shyam Seth**. It is located in the village of **Mandaphia in the Chittorgarh district of Rajasthan**. It was built in 1840 A.D. The temple follows the traditional architecture of Rajasthan, known for its intricate carvings, domes, and vibrant colours. Th**e main structure of the temple is built using white marble**. The temple is adorned with intricate carvings on the walls, pillars, and ceilings. These carvings depict scenes from Hindu mythology and various motifs. The temple features multiple domes that are adorned with decorative elements. **The temple has a prominent spire, or Shikhar, which is a tall, tapering structure that rises above the main sanctum. In the sanctum sanctorum of the temple, a black stone idol of Lord Krishna is installed.**

4. **Green Ammonia:** Recently, V.O. Chidambaranar Port Authority, Tamil Nadu, successfully received and handled Green Ammonia Containers from Damietta Port, Egypt. It is **produced by using hydrogen from water electrolysis and nitrogen separated from the air.** These are then fed into the Haber process (also known as Haber-Bosch) which is powered by sustainable electricity. **In the Haber process, hydrogen and nitrogen are reacted together at high temperatures and pressures to produce ammonia, and NH3.** Green ammonia production is the process of making ammonia 100% renewable and carbon-free. **It can be used in Fuel for engines such as locomotives and shipping**, replacing diesel and marine fuel oil, Fuel source for electricity and power generation, Building block to make fertilizers for use in agriculture; Feedstock for industrial and manufacturing applications ranging from water purification through to pharmaceuticals.

4.10.23

1. **International Coral Reef Initiative:** It was launched in 1994 by **Australia, France, Japan, Jamaica, the Philippines, Sweden, Britain and the United States**. Its members now include 45 countries that represent three-quarters of the world's coral reefs. India is also a member country of this initiative. It is a **global partnership between Nations and organizations that strives to preserve coral reefs and related ecosystems around the world**. Its decisions are not binding on its members. The work of ICRI is regularly acknowledged in United Nations documents, highlighting the Initiative's important cooperation, collaboration and advocacy role within the international arena.

2. **United Nations Convention against Transnational Organised Crime:** It is a multinational treaty against transnational organized crime that was established by the United Nations in 2000. It is **often known as the Palermo Convention. The UNTOC has a total of 147 signatories and 190 parties to the convention.** The Convention is further supplemented by three Protocols: **The**

Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children; The Protocol against the Smuggling of Migrants by Land, Sea and Air; and The Protocol against the Illicit Manufacturing of and Trafficking in Firearms, their Parts and Components and Ammunition. India signed the UN Convention against Transnational Organized Crime (UNTOC) and its three Protocols on December 12, 2002. **The Central Bureau of Investigation (CBI) is the nodal agency for all dealings with UNTOC.**

3. **Exercise SAMPRITI:** India and Bangladesh commenced the 11th edition of exercise SAMPRITI in Umroi, Meghalaya. It is an **annual joint military exercise between India and Bangladesh**. It was started in Jorhat, Assam in 2009, the exercise has witnessed ten successful editions till 2022. This exercise, alternatingly organised by both countries, signifies strong bilateral defence cooperation initiatives. **SAMPRITI-XI, scheduled for 14 days, will engage approximately 350 personnel from both sides.**

4. **Attosecond**: This year's Nobel Prize in Physics has been awarded to three physicists for their research into attosecond pulses of light. **An attosecond is an astonishingly short unit of time, equivalent to one quintillionth of a second (1×10−18 of a second) or one-billionth of a nanosecond**. To put this into perspective, if a second were stretched to cover the entire age of the universe, which is approximately 13.8 billion years, an attosecond would be just a fraction of a second. **The fundamental significance of attoseconds in physics lies in their ability to shed light on phenomena that were previously hidden from our view**. These extremely short time intervals are relevant in the fields of ultrafast optics and laser physics, particularly when studying the behaviour of electrons within atoms and molecules. Attosecond physics allows scientists to look at the very smallest particles at the very shortest timescales. At this timescale, researchers can now capture the dynamics of electrons within atoms and molecules, allowing them to witness the incredibly fast processes that govern chemical reactions and electronic behaviour.

One of the most groundbreaking applications of attosecond science is the **ability to create and manipulate extreme ultraviolet (XUV) and X-ray pulses,** which are vital for imaging ultrafast processes at the atomic and molecular scale.

These pulses are produced using high-intensity laser systems that generate attosecond bursts of light.

5.10.23

1. **Non-Alcoholic Fatty Liver Disease (NAFLD):** NAFLD is the term for a range of conditions caused by a buildup of fat in the liver. This buildup of fat is not caused by heavy alcohol use. When heavy alcohol use causes fat to build up in the liver, this condition is called alcohol-associated liver disease. **Two types of NAFLD are nonalcoholic fatty liver (NAFL) and nonalcoholic steatohepatitis (NASH).NAFL is a form of NAFLD in which you have fat in your liver but little or no inflammation or liver damage**. However, NAFL can cause pain from enlargement of the liver. **NASH is the form of NAFLD in which you have inflammation of the liver and liver damage, in addition to fat in your liver**. The inflammation and liver damage of NASH can cause fibrosis, or scarring, of the liver. NASH may lead to cirrhosis, in which the liver is scarred and permanently damaged. Cirrhosis can lead to liver cancer. NAFLD can affect people of any age, including children. There's currently no specific medication for NAFLD. Doctors recommend weight loss to treat NAFLD. Weight loss can reduce fat, inflammation, and fibrosis in the liver. Treatment may also be recommended for associated conditions (high blood pressure, diabetes, and cholesterol) or complications.

2. **Very Short-Range Air Defence (VSHORAD) missile system:** It is a Man Portable Air Defence System (MANPAD) specially designed to counter low-altitude aerial threats over short distances. These are short-range, lightweight, and portable surface-to-air missiles that can be fired by individuals or small groups. It has been **designed and developed indigenously by DRDO's Research Centre Imarat (RCI), Hyderabad**, in collaboration with other DRDO laboratories and Indian industry partners. The use of VSHORAD missiles in India is primarily by the Indian Army. The missile incorporates many novel technologies, including a **Dual-band IIR Seeker, a miniaturised Reaction Control System, and integrated avionics.** It is propelled by a dual-thrust solid motor.

3. **National Investment and Infrastructure Fund:** It is an investor-owned fund manager, anchored by the Government of India (GoI) in collaboration with leading global and domestic institutional investors. I**t is India's first-ever sovereign wealth fund (SWF) which was set up in the year 2015.** It is an institution for enhancing infrastructure financing by investing in greenfield (new), brownfield (existing) and stalled projects. **The primary goal of setting up NIIF was to optimise the economic impact largely through investing in infrastructure-related projects.**

Types of NIIF Funds:

- **Master Fund:** This fund primarily invests in infra-related projects such as roads, ports, airports, and power. Also, the master fund invests in well-established enterprises that are in a long-term agreement and are operating in a regulated environment with a good history.
- **Fund of Funds:** It looks to invest in funds managed by renowned fund managers having excellent track records. The fund of funds invests as anchor investors, and this enables the fund managers to accumulate more funds from the institutional investors
- **Strategic Fund:** This fund is registered as an Alternative Fund II under the Securities and Exchange Board of India (SEBI) in India. Strategic funds invest primarily in equity and equity-linked instruments. **The funds are registered as Alternative Investment Funds (AIF) with the Securities and Exchange Board of India (SEBI).**

6.10.23

1. **Labour Force Participation Rate (LFPR):** LFPR is defined as the percentage of persons in the labour force (working or seeking or available for work) in the population. And, the **female LFPR (FLFPR) is the percentage of working-age women currently employed or seeking employment**

2. **The Periodic Labour Force Survey (PLFS) Data for Women:** The **PLFS data indicates that for women in the working age group (15-59 years), LFPR is only 35.6 per cent in India 2021-22**. The participation rate stands at 39.3 per cent and 26.5 per cent, respectively, in rural and urban areas. However, from 2017 to 2021, women's LFPR increased relative to men, particularly in rural areas.

3. **Chhatrapati Shivaji Maharaj:** He was the **founder of the Maratha Empire** in western India. He was born on February 19, 1630, to Shahaji Bhosle and Jijabai in the fort of Shivneri, near the city of Junnar in the Pune district, Maharashtra. With his valour and great administrative skills, Shivaji carved out an enclave from the declining Adilshahi sultanate of Bijapur. It eventually became the **genesis of the Maratha Empire**. After establishing his rule, Shivaji implemented a competent and progressive administration with the help of a disciplined military and a well-established administrative set-up. He was **known as the Father of the Indian Navy. Shivaji was the first to realise the importance of having a naval force**, and therefore he strategically established a navy and forts at the coastline to defend the Konkan side of Maharashtra**. He was called the 'Mountain Rat' and was widely known for his guerrilla warfare** He was called so because of his awareness of the geography of his land and guerrilla tactics like raiding, ambushing, and surprise attacks on his enemies**. He was a secular ruler who was very accommodating of all religion**s. He had numerous Muslim soldiers in his army. Shivaji was a dependable supporter of women and their honour. Anyone under his rule caught violating women's rights was severely punished. He had a **council of ministers (Asht Pradhan) to advise him on the matters of the state, but he was not bound by it.**

4. **Burevestnik Missile:** The Burevestnik, whose name translates as "storm petrel", is a ground-launched, low-flying cruise missile that is not only capable of carrying a nuclear warhead but is also nuclear-powered**. The Burevestnik is one of six strategic weapons that the Russian President introduced in a 2018 speech. It is code-named 'SSC-X-9 Skyfall' by NATO**. In theory, nuclear energy could let it fly around the world several times before hitting its target. It is **powered by a small nuclear reactor**, which heats air to propel the missile forward. Its nuclear propulsion gives the missile a much longer range than traditional turbojet or turbofan engines which are limited by how much fuel they can carry. It has a range of up to 14,000 miles (22000 km). The missile is also **designed to fly at low altitudes**, much lower than a conventionally powered cruise missile, which would make it harder for air-defence radar to detect.

5. **Chungthang Dam:** Chungthang Dam, also known as the **Chungthang Hydroelectric Project**, is a dam and hydroelectric power station located in Chungthang, a town in Sikkim. It is an **integral part of the 1200 MW mega Teesta Stage III Hydro Electric Project,** a major source of electricity for Sikkim and West Bengal. It is a run-of-the-river hydroelectric project, which was **commissioned in 2017**. The dam had a gross height of 817 metres and a net head of 778 metres, which was used for power generation.

7.10.23

1. **Section 106 of the Indian Evidence Act:** Section 106 of the Indian Evidence Act, 1872, deals with the burden of proof in cases where a fact is within the special knowledge of a person**. This section applies to civil and criminal cases alike and lays down an important principle of evidence**. The **section states that when any fact is especially within the knowledge of any person, the burden of proving that fact is upon that person**. This

means that if a fact is known to a particular person and not to others, it is the responsibility of that person to prove it in court.

For example, in a case where the ownership of a property is disputed, and the disputed property was in the possession of the defendant, the burden of proving that he acquired the property lawfully and has the right to possess it will be on the defendant. Similarly, in a criminal case where the accused is alleged to have killed someone with a knife, the burden of proving that the accused used the knife to commit the crime will be on the prosecution. T**he burden of proof under Section 106 is not absolute,** and the person who has special knowledge of the fact is only required to prove it to the extent that is reasonable in the circumstances. The person is not required to prove the fact beyond all doubt, but only to the extent that a reasonable person would believe it to be true.

2. **Atmospheric Perturbations around the Eclipse Path (APEP) mission:** The **mission will involve the launching of three rockets equipped with scientific instruments.** The objective is to know how the upper atmosphere will change during the eclipse, especially the moment when there would be a sudden reduction in light. During an eclipse, the sudden drop in sunlight causes changes in the ionosphere, creating waves that ripple through this atmospheric layer. It will measure changes in electric and magnetic fields, density, and temperature.

This launch will take place at the White Sands Missile Range in New Mexico, with a specific focus on the ionosphere. **According to NASA, the ionosphere's temperature and density are projected to decrease during the eclipse, resulting in a wave-like disturbance that has the potential to disrupt GPS and other satellite communications.** The rockets will be positioned just outside the path of annularity, where the Moon moves directly in front of the Sun. Each rocket will deploy four small scientific instruments designed to record changes in electric and magnetic fields, density, and temperature.

3. **Gangetic river dolphin:** It is a freshwater species and one of the few river dolphins found in the world. It inhabits the **Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of Nepal, India**, and Bangladesh. It has been **recognized as India's National Aquatic Animal.** It has a long thin snout, rounded belly, stocky body and large flippers. It feeds mainly on fish and is usually found in counter-current systems of the main river channel. Its eyes lack lens, and as a result, this species is also **referred to as the "blind dolphin".** They have a highly developed bio-sonar system that facilitates them to hunt for fish even in murky waters. Being a mammal, the **Ganges River dolphin cannot breathe in the water and must surface every 30-120 seconds**. Because of the sound it produces when breathing, the **animal is popularly referred to as the 'Susu'.**

Conservation status: IUCN: Endangered, Wildlife (Protection) Act: Schedule-I, CITES: Appendix I.

9.10.23

1. **Project Veer Gatha 3.0:** Project Veer Gatha was instituted under the Gallantry Awards Portal (GAP) in 2021. The **aim is to disseminate the details of acts of bravery of the Gallantry Awardees and the life stories of these brave hearts among the students so as to raise the spirit of patriotism** and in still amongst them values of civic consciousness. As part of this, the students framed different projects through various media like art, poems, essays and multimedia on these gallantry award winners and the best projects were awarded at the national level by the Ministry of Defence and the Ministry of Education. Under the **Veer Gatha Project 3.0, the following activities have been conducted- Schools have conducted various projects/activities and have uploaded a total of 04 best entries from each school, on the MyGov portal.** Simultaneously, to bring about awareness among school students about the Gallantry Award Winners of our country, the Ministry of Defence, through its field organisations or Army/Navy/Airforce, has organized virtual/ face-to-face awareness programmes/sessions for schools across the country.

2. **Gallantry Awards:** They have been instituted by the Government of India to honour the acts of bravery and sacrifice of the officers/personnel of the Armed Forces, other lawfully constituted Forces and civilians**. These gallantry awards are announced twice a year- first on the occasion of the Republic Day and then on the occasion of the Independence Day**. Three gallantry awards, namely **Param Vir Chakra, Maha Vir Chakra and Vir Chakra,** were instituted by the Government of India on 26th January 1950. Thereafter, the other three gallantry awards, i.e. the **Ashoka Chakra Class-I, the Ashoka Chakra Class-II and the Ashoka Chakra Class-III were instituted in 1952.** These awards were renamed Ashoka Chakra, Kirti Chakra and Shaurya Chakra, respectively, in 1967. The order of precedence of these awards is the Param Vir Chakra, the Ashoka Chakra, the Mahavir Chakra, the Kirti Chakra, the Vir Chakra and the Shaurya Chakra. All the gallantry awards may be awarded posthumously.

3. **Indian Air Force (IAF) Ensign:** Only the IAF Crest will be incorporated into the new IAF Ensign. This **crest prominently features the national symbol, the Ashoka Lion, at the top, with the words "Satyamev Jayate" in Devanagari script below it**. Beneath the Ashoka Lion is a Himalayan eagle with outstretched wings, symbolising the fighting spirit of the IAF. **A ring in light blue colour encircles the Himalayan eagle with the words "Indian Air Force".** The IAF motto, derived from the **Bhagavad Gita, "Nabha Sparsham Deeptam", meaning "touching the sky with glory,"** is inscribed below the Himalayan eagle in golden Devanagari. **The IAF crest symbolises the source of inspiration and encouragement.** IAF has adopted various crests for commands, squadrons and other establishments. However, all the crests follow a standard frame that contains the individual formation sign with a motto shown in the scroll at the foot of the frame.

4. **Mundra Port:** It is the **largest private port and the largest container port in India**. It is located on the north shores of the Gulf of Kutch, near Mundra, Kutch district, Gujarat. It is a deep-draft, all-weather port. **It is also a special economic zone (SEZ)**. As much as 33 per cent of India's container traffic flows through the port. **It is run by Adani Ports and Special Economic Zone Limited (APSEZ), which is India's largest commercial port operator** and accounts for nearly one-fourth of the country's cargo movement. **It also has the country's largest coal import terminal,** which facilitates faster cargo evacuation with minimal turnaround time. **Mundra Port's rail is connected to the national rail network,** and cargo can be handled from any location in India.

10.10.23

1. **Periodic Labour Force Survey**: The recent Periodic Labour Force Survey (PLFS) has reported that the unemployment rate in the country has shown a decrease between April and June 2023.

2. **Findings:** The Labour Force Participation Rate (LFPR) for persons **aged 15 years and above and the Worker-Population Ratio (WPR) improved during the period.** The LFPR in urban areas increased from 47.5% in April-June 2022 to 48.8% in April-June 2023 for persons aged 15 years and above. The WPR in urban areas increased from 43.9% in April-June 2022 to 45.5% in similar months this year for persons aged 15 years and above. For males, it increased from 68.3% to 69.2% and for females, it increased from 18.9% to 21.1% during this period.

3. **Hemochromatosis**: It is an inherited condition where iron levels in the body slowly build up over many years. **This health condition is primarily classified into two types:**

Hereditary hemochromatosis: It is **driven by a mutation in the HFE gene**, resulting in individuals being homozygous for the C282Y variant. This genetic anomaly sets the stage for a lifelong struggle with excessive iron absorption within the intestines.

Secondary hemochromatosis: It is typically caused by external factors like **frequent blood transfusions, excessive iron supplementation, or certain medical conditions.** The iron accumulation in secondary hemochromatosis is often more rapid and can have a similar impact on organ function. Symptoms of haemochromatosis usually start between the ages of 30 and 60. **Phlebotomy is the standard treatment for primary hemochromatosis.** Iron toxicity can be reduced by removing red blood cells, the body's main mobilizer of iron. Phlebotomy is usually performed once or twice a week.

4. **Exercise CHAKRAVAT**: It is an **Annual Joint Humanitarian Assistance and Disaster Relief HADR Exercise (AJHE) since its first edition in 2015,** the Annual Joint HADR Exercise, CHAKRAVAT has transformed itself into a multi-agency endeavour. T**he exercise has been conducted by the Indian Army, Indian Navy (IN) and Indian Air Force (IAF) in rotation since 2016.** The 2023 edition of the exercise is being hosted by the Indian Navy at Goa. The exercise will witness participation from various national agencies namely, National Disaster Management Authority (NDMA), National Disaster Response Force (NDRF), National Institute for Disaster Management (NIDM), Indian Army, Indian Navy, Indian Air Force, Coast Guard, Indian Metrological Department (IMD) and other organizations.

5. **2023 Economics Nobel Prize:** It has been **awarded to economist Claudia Goldin** for advancing the understanding of women's labour market outcomes**. The Nobel Prize in Economic Sciences is also known as the Sveriges Riksbank Prize in Economic Sciences. Goldin is only the third woman to win the prize since it was first introduced in 1969.** She provided the first comprehensive account of women's earnings and labour market participation through the centuries. Her research reveals the causes of change as well as the main sources of the remaining gender gap. S**he showed that female participation in the labour market did not have an upward trend over**

a 200-year period, but instead formed a U-shaped curve. The participation of married women decreased with the transition from an agrarian to an industrial society in the early nineteenth century but then started to increase with the growth of the service sector in the early twentieth century.

11.10.23

1. **Indian Pharmacopoeia Commission:** Recently, the Pharmacopoeial Discussion Group (PDG) announced the Indian Pharmacopoeia Commission (IPC) as a PDG member during the PDG Stakeholder's meeting in Hyderabad. It is an **autonomous Institution of the Ministry of Health and Family Welfare, Govt. of India**. It was created to set standards for drugs in the country. It**s basic function is to update regularly the standards of drugs commonly required for the treatment of diseases prevailing in this region.** It publishes official documents for improving the Quality of Medicines by way of adding new and updating existing monographs in the form of Indian Pharmacopoeia (IP). It further promotes the rational use of generic medicines by publishing the National Formulary of India. It prescribes standards for identity, purity and strength of drugs essentially required from the health care perspective of human beings and animals. It **also provides IP Reference Substances (IPRS) which act as a fingerprint for identification of an article under test and its purity as prescribed in IP.**

2. **Lakhpati Didi Initiative:** It was announced by the Prime Minister in his Independence Day speech on August 15, 2023. It is to **encourage women to start micro-enterprises within their villages**. Under the Lakhpati Didi Initiative, the government aims to train two crore women. **The programme is aimed at training women in self-help groups (SHGs) so that they can earn a sustainable income of at least Rs. 1 lakh per annum per household. The initiative has been initiated by DAY-NRLM**, wherein each SHG household is encouraged to take up multiple livelihood activities coupled with value chain interventions, resulting in a sustainable income of Rs. 1 lakh or more per year. **Under this scheme, women will be trained in various skills, such as plumbing, LED bulb making, drone operation and repair, and tailoring and weaving**. After completing the training, women will be provided with opportunities to earn income using their skills. **The ministry of Rural Development** is adopting a whole-of-government approach for maximum impact through convergence to transform the rural economy with the **enabling of 'Lakhpati Didis'.**

3. **Gaza Strip:** The Gaza Strip is a **self-governing Palestinian territory located on the eastern coast of the Mediterranean Sea.** The territory takes its name from Gaza, its main city. **It forms the smaller of the two Palestinian territories — the other being the West Bank.** It is bordered by Israel to the north and east and Egypt to the south. It is a 41km (25-mile) long and 10 km-wide territory. It has a temperate climate, with mild winters, and dry, hot summers. **It is one of the most densely populated areas in the world.** More than 2 million people live in the territory. The population is predominantly Palestinian, with the majority being Sunni Muslims. **After Israel declared its statehood in 1948, Egypt controlled the Gaza Strip for nearly two decades**. Israel then gained control of the Gaza Strip and the West Bank after its victory in the 1967 Six-Day War against its Arab neighbours. For the next 38 years, Israel controlled the strip and enabled the construction of 21 Jewish settlements. In 2005, under international and domestic pressure, Israel withdrew around 9,000 Israeli settlers and its military forces from the Gaza Strip, leaving the enclave to be governed by the internationally recognised Palestinian Authority, which also controlled parts of the occupied West Bank. **Hamas, a Palestinian Islamist organisation, currently governs the Gaza Strip.**

12.10.23

1. **Rasmussen's encephalitis:** It is a very r**are, chronic inflammatory neurological disease that usually affects only one hemisphere (half) of the brain**. It most often occurs in **children under the age of 10 but can also affect adolescents and adults**. Symptoms include Frequent and severe seizures, Inflammation of the brain (encephalitis), mental deterioration, Progressive loss of neurological functions including motor skills, and speech, and eventual paralysis on one side of the body (hemiparesis).

Treatment may include: Antiseizure medications usually don't completely manage seizures due to RE. But they may help decrease the frequency and severity of the seizures.

Immunotherapy: Immunotherapy at the beginning of RE may help manage seizures or prevent further immune-related brain damage.

Brain surgery: It involves surgically removing or disconnecting half of your child's brain from the rest of their brain.

2. **Mera Yuva Bharat:** It is an autonomous body that will benefit the youth in the **age group of 15-29 years, in line with the definition of 'Youth' in the National Youth Policy.** In the case of programme components specifically meant for adolescents, the beneficiaries will be in the age group of 10-19 years. It will help in setting the focus of the Government on **youth-led development and to make the Youth "active drivers" of development and not merely "passive recipients".** It will be **launched on 31st October 2023 on National Unity Day.** The primary objective of Mera Yuva Bharat (MY Bharat) is to make it a whole of Government platform for youth development.

Under the new arrangement, with access to resources & connection to opportunities**, youth would become community change agents and nation builders allowing them to act as the Yuva Setu between the Government and the citizens.**

3. **Lyme disease:** It is a vector-borne infectious disease caused by the bacterium Borrelia burgdorferi. **It is primarily transmitted to humans through the bite of infected black-legged ticks, often referred to as deer ticks. Lyme disease cannot spread:** between humans from pets to humans, through air, food, or water Lice, mosquitoes, fleas, and flies also do not transmit it. It **is most commonly reported in North America, Europe, and some parts of Asia**. Early symptoms of Lyme disease start between 3 to 30 days after an infected tick bites you. The symptoms can include a red rash called erythema migrans (EM). As it starts to get better, parts of it may fade. Sometimes this makes the **rash look like a "bull's-eye. "**If left untreated, it can lead to more severe symptoms, affecting the joints, heart, and nervous system. The standard treatment for Lyme disease is antibiotics, such as doxycycline or amoxicillin, especially in the early stages.

4. **Indian Ocean Rim Association:** IORA is an inter-governmental organisation that was established in March 1997. It was **formerly known as the Indian Ocean Rim Initiative and the Indian Ocean Rim Association for Regional Cooperation (IOR-ARC).** The IORA Secretariat is based in Mauritius. **It became an observer to the UN General Assembly and the African Union in 2015**. It has 23 Member States and 11 Dialogue Partners. **China is a dialogue partner in the IORA.** Its **objective is to promote sustainable growth and balanced development of the region;** to focus on those areas of economic cooperation which provide maximum opportunities for development, shared interest and mutual benefits; to promote liberalisation, remove impediments and lower barriers towards a freer and enhanced flow of goods, services, investment, and technology within the Indian Ocean rim.

13.10.23

1. **Navratna Status:** The government categorizes all Public Sector Undertakings (PSUs) into three categories, namely **Maharatna, Navratna, and Miniratna**. To get Navratna status, **the PSU should be a Miniratna-I, Schedule 'A' company, should have obtained an 'excellent' or 'very good' MoU rating in three of the last five years, and must have a composite score of 60 in six performance indicators**. For a company to achieve Navratna status, it must report a net profit of more than Rs. 5,000 crore for three consecutive years, maintain an average annual turnover of Rs. 25,000 crore for three years, or have an annual average net worth of over Rs. 15,000 crore for three years. Navratna PSUs have a comparative advantage over other companies as they have been granted financial independence to invest up to Rs. 1,000 crore without seeking approval from the Union government. **The board of the 'Navratna companies has the autonomy to incur capital expenditure on the purchase of new items or for replacement without any monetary ceiling and to enter into technology joint ventures or strategic alliances, among others**. The status gives the Board of Directors of these CPSEs the power to allow mergers and acquisitions in India and abroad. However, they need approval from the Cabinet Committee on Economic Affairs (CCEA) to make investments abroad.

2. **Airports Economic Regulatory Authority (AERA):** AERA is a statutory body constituted under the Airports Economic Regulatory Authority of India Act, 2008. The AERA regulates tariffs and other charges (development fee and passenger service fee) for aeronautical services (air traffic management, landing, and parking of aircraft, and ground handling services) at major airports**. The 2008 Act designates an airport as a major airport if it has an annual passenger traffic of at least 15 lakh.** An amendment to the act in 2019 increased this threshold to 35 lakh annual passengers. For the remaining airports, tariffs are determined by the Airports Authority of India (AAI).**AERA is an independent economic regulator that aims to create a level playing field, foster healthy competition amongst all major airports, encourage investment in airport facilities, and regulate tariffs for aeronautical services**. **Headquarters: Delhi**

3. **Poorvottar Sampark Setu portal:** It is a **powerful tool designed to streamline and enhance the monitoring of Fortnightly visits of Union Ministers to NER**. The dashboard provides valuable insights and graphical information about State-wise/ District-wise visits to the North Eastern Region by Union Ministers to be used by all the stakeholders in one place**. The portal generates a curated list of Ministers who can be nominated for a visit to NER in the upcoming months**. After the visit, the Minister can submit their tour reports along with their recommendations online. MDoNER can forward the recommendations to respective line Ministries/Departments/State Governments for quick action, after analyzing the same. The Portal generates the summary report on the visits by a single click.

4. **One CGIAR global initiative:** Recently, the **International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) joined the One Consultative Group on International Agricultural Research (CGIAR) global initiative**. It aims to build a unified approach to transforming food, land, and water systems to address the challenges posed by the climate crisis. **This initiative involves the CGIAR System Organisation and 12 One CGIAR research centres.** The CGIAR is a publicly-funded network of agri-food systems research centres that works for transforming food, land, and water systems in a climate crisis. **It is working in over 80 countries.**

14.10.23

1. **Sagar Maitri:** It is a novel initiative of the Defence Research and Development Organisation (DRDO). **It supports the broad objective of India's policy declaration 'Security and Growth for All in the Region (SAGAR)'** to promote closer cooperation in socio-economic aspects as well as more significant scientific interaction, especially in ocean research among Indian Ocean Rim (IOR) countries. **Under the aegis of this policy, DRDO initiated a scientific component named 'MAITRI (Marine and Allied Interdisciplinary Training and Research Initiative)', which focuses on establishing long-term collaboration with IOR countries in the field of 'Ocean Research and Development'.** The missions aim to **establish long-term scientific partnerships and collaborations with Oman, the Maldives, Sri Lanka, Thailand, Malaysia, Singapore, Indonesia, and Myanmar** — the eight IOR countries. The current mission (SM-4) plan includes scientific deployments on-board INS Sagardhwani in the Northern Arabian Sea and initiating collaborative research programmes with the Department of Marine Sciences & Fisheries at Sultan Qaboos University, Oman. These missions give the scientists an opportunity to cooperate and build strong working relationships with their IOR counterparts studying the oceans.

2. **Hepatitis C:** It is a v**iral infection that affects the liver. It can cause both acute (short-term) and chronic (long-term) illness.** It can be life-threatening. It is **spread through contact with infected blood.** This can happen through sharing needles or syringes, or from unsafe medical procedures such as blood transfusions with unscreened blood products. It **can be passed from an infected mother to her baby and via sexual practices that lead to exposure to blood.** Hepatitis C is not spread through breast milk, food, water or casual contact such as hugging, kissing and sharing food or drinks with an infected person. It can include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine and yellowing of the skin or eyes (jaundice). This virus infection occurs in all WHO regions. **The highest burden of disease is in the Eastern Mediterranean Region and European Region.** New HCV infections are usually asymptomatic, few people are diagnosed when the infection is recent. In those people who develop chronic HCV infection, the infection is often undiagnosed because it remains asymptomatic until decades after infection when symptoms develop secondary to serious liver damage. **There is no vaccine for hepatitis C, but it can be treated with antiviral medications**

3. **Green Credit Programme (GCP):** GCP **aims to incentivise environmentally conscious practices and promote a sustainable lifestyle through a market-based mechanism**. As per the scheme, individuals, industries, farmers producer's organisations (FPOs), urban local bodies (ULB), gram panchayats, and the private sector, among a host of other entities, will be able to earn green credit for undertaking environment-friendly actions. **Green credits generated through such actions can be traded on a domestic market platform**. These Green Credits will be over and above the current discourse of carbon credits. Any activity generating green credits under the GCP will also receive carbon credits under the Carbon Credit Trading Scheme if it leads to the reduction or removal of carbon emissions. The green credits generated or procured by industries, companies and other entities to fulfil any legal obligation cannot be traded. **The Indian Council of Forestry Research and Education (ICFRE), an autonomous**

organisation under the MoEFCC, is responsible for effectively implementing the Green Credit programme, including its management and operation. The programme will be implemented in phases.

16.10.23

1) Jericho Missile System: Jericho is **Israel's original ballistic missile programme, initiated in the 1960s and named after the biblical city located in the West Bank**. This programme was initially a collaboration with the French aerospace company Dassault, but when France withdrew in 1969, Israel continued its development.
Jericho-1: It had a **weight of 6.5 tonnes, a length of 13.4 metres, and a diameter of 0.8 metres**. It had a range of 500 kilometres and could carry a 1,000-kilogram payload, though it had a 50 per cent chance of hitting within a 1,000-metre radius of its target. It was retired in the 1990s.
Jericho-2: It was **developed in the late 1980s, with a length of 15 metres and a diameter of 1.35 metres, while maintaining the same payload capacity.** It had a range between 1,500 and 3,500 kilometres.
Jericho-3: It is the **first Israeli Intercontinental Ballistic Missile (ICBM).** It was **first tested in 2008 and entered service in 2011.** It featured improvements over the previous models, with a longer length than Jericho-2 and a larger diameter of 1.56 metres. It has an estimated launch weight of 29,000 kg and a payload of 1,000 to 1,300 kg. It has a range of 4,800 to 6,500 km and uses inertial guidance with a radar-guided warhead.

2) Inter-Parliamentary Union (IPU): IPU is the international organization of Parliaments. It was **established in 1889 in Paris to promote representative democracy and world peace**. The IPU facilitates parliamentary diplomacy and empowers parliaments and parliamentarians to promote peace, democracy, and sustainable development around the world. It was **the first multilateral political organization in the world, encouraging cooperation and dialogue between all nations.**
Slogan: "For democracy. For everyone." Today, the IPU comprises 179 member parliaments and 13 associate members. **The IPU moved its headquarters to Geneva in 1921**. The IPU is financed primarily by its members out of public funds.

3) Saraswati Samman Award: Recently, **Tamil writer Sivasankari was presented with the 'Saraswati Samman' 2022 for her book of memoirs Surya Vamsam.** It is given annually for outstanding literary works in 22 Indian languages in the last 10 years. **It is among the highest recognitions in the field of Indian literature**. The selection follows a rigorous three-tier process leading up to a final decision by Chayan Parishad It was **instituted by the K. Birla Foundation (the Vyas Samman and the Bihari Puraskar** are other literary awards instituted by the foundation.). It carries a citation, a plaque and prize money of 15 lakh rupees.

4) Diverse Epigenetic Epidemiology Partnership (DEEP): It is **a ground-breaking integrated genomics and epigenomics study to understand the genetics behind Non-Communicable Diseases (NCDs) in diverse populations, including South Asians.** The project is to uncover the effects of genomic and environmental diversity on disease risk observed in people across the world, including those in Asia, Africa and North and South America. It is a **five-year international project. Researchers will be studying individuals representing diverse genetic and environmental contexts and learn which DNA methylation patterns contribute to their disease risk in each context.** The study will develop software and infrastructure and conduct advanced statistical analyses to build new resources. This research will enable the identification of disease-causing mechanisms that are common worldwide and those that are unique to particular groups or regions.

17.10.23

1) Setu Bandhan Scheme: The Setu Bandhan Scheme approval has been granted for seven bridge projects in Arunachal Pradesh under the Central Road and Infrastructure Fund (CRIF). It is an **initiative of the Ministry for Road Transport and Highways**. It has been **introduced to improve inter-state connectivity**, especially in rural areas at the borders where state roads do not get the required attention. It is **aimed at replacing railway line Level Crossings (LCs) with Road Over Bridges (ROBs)/Rail Under Bridges (RUBs) in states.**

2) Central Road and Infrastructure Fund: It was established in 2000 under the Central Road Fund Act, 2000**. It was previously known as the Central Road Fund**. Its subject matter belongs to the Ministry of Finance. The fund consists of a cess imposed along with excise duty on petrol and diesel. **The Central Road Fund Act, 2000, was amended in 2018 and its objective is to use proceeds of the road cess under CRIF to finance other infrastructure** projects such as waterways, some portion of the railway infrastructure, and even social infrastructure.

3) Mt. Vesuvius: It is an **active volcano that rises above the Bay of Naples on the plain of Campania in southern Italy.** It is the **only active volcano in mainland Europe**. The volcano is **classified as a complex**

stratovolcano because its eruptions typically involve explosive eruptions as well as pyroclastic flows. A pyroclastic flow is a high-density mix of hot lava blocks, pumice, ash, and volcanic gas. It is **most famous for the 79 AD eruption that destroyed the Roman cities of Pompeii and Herculaneum**. It is part of the Campanian volcanic arc, a line of volcanoes that formed over a subduction zone created by the convergence of the African and Eurasian plates. This subduction zone stretches the length of the Italian peninsula and is also the source of other volcanoes like **Mount Etna, the Phlegraean Fields (Campi Flegrei), Vulcano, and Stromboli.**

4) INS Beas: INS Beas (F37) is a **Brahmaputra-class frigate of the Indian Navy**. It was built at the Garden Reach Shipbuilders and Engineers (GRSE), Kolkata. It was **commissioned on 11th July 2005**. It is the second ship in the Indian Navy to bear the name. **The first was a Leopard-class frigate commissioned in 1960 and scrapped in 1992.**
Role: It is a versatile warship capable of a range of missions, including anti-aircraft, anti-submarine, and anti-ship warfare. It is **also used for patrolling, surveillance, and providing security to India's maritime interests**. The design and construction of the ship are entirely Indian and are a modification of the Godavari-class frigate. It has a displacement of about 3,850 tonnes. The ship has a length of 126 metres (413 feet) and a beam width of 14.5 metres (48 feet). It is **capable of reaching speeds of over 30 knots, making it swift and agile in naval operations.** It is fitted with an array of modern sensor suites and matching weapon systems.

5) Bright Transient Survey Bot: It is a **machine-learning algorithm** that has been trained by using over 1.4 million images from nearly 16,000 sources. It de**tected the newly discovered supernova named SN2023tyk in data from the Zwicky Transient Facility (ZTF).** It automatically requested the potential supernova's spectrum from Palomar Observatory, where another robotic telescope, the S**pectral Energy Distribution Machine (SEDM), performed an in-depth observation to obtain the source's spectrum**. This new system not only allows automation of the entire search for new supernovae across the night sky but also eliminates human error and dramatically increases speed. It searched, detected, confirmed, classified, and announced the findings without any human intervention.

18.10.23

1) Rafah Crossing: Recently, the **area of the Rafah Border Crossing has been reportedly hit by a military strike**. The crossing is at the south end of the Gaza Strip, a narrow slither of land that is home to 2.3 million people. It is **wedged between Israel, Egypt, and the Mediterranean Sea. The crossing is controlled by Egypt.**
It is the only likely route for humanitarian aid to enter Gaza via Rafah from Egypt's Sinai Peninsula region. **There are only two other border crossings:** Erez, a border crossing with Israel in north Gaza, and Kerem Shalom, a commercial crossing between Israel and Southern Gaza.

2) RISC-V technology: It is an **open-source technology that is pronounced "risk five"**. It is an open-source instruction set architecture (ISA) used for the development of custom processors targeting a variety of end applications**. It is considered the fifth generation of processors built on the concept of the reduced instruction set computer (RISC).**
It was begun as a **project at UC Berkeley** to create an open-source computer system based on RISC principles. It was initially designed for academic use. The standard has evolved and is now managed by RISC-V International. **As an open-standard architecture, RISC-V is defined by member companies of RISC-V International, the global non-profit organization behind the ISA.** The intent is that through collaboration, the member companies can contribute to new avenues of processor innovation while promoting new degrees of design freedom. It features a small core set of instructions upon which all the design's software runs. **The architecture allows designers to customize and build their processors in a way that's tailored to their target end applications**. Its open-standard nature allows collaboration and innovation across the industry. The entire RISC-V architecture can be scrutinized closely in the public domain, eliminating back doors and hidden channels.

3) Advanced Traffic Management System (ATMS) Standards: It is to enhance road safety, reducing incidence response time and digital enforcement on national highways and expressways. **The new standard includes the following features:** It provides for the implementation of digital highways by developing integrated utility corridors along the national highways to develop optic fibre cables (OFC) infrastructure. **Under the new standards, the existing VIDS cameras will be replaced with the Video Incident Detection and Enforcement System (VIDES) to emphasize the digital enforcement of traffic rules**. For comprehensive coverage, these **cameras are slated for installation every 10 km along National Highway**s and the **feeds from these cameras will be integrated at the command and control centres located at every 100 km.** The vehicle speed detection system (VSDS) is now integrated into VIDES, optimizing the use of automatic

number plate recognition (ANPR) cameras. Depending on the detected incident, VIDES will alert route patrol vehicles or ambulances, generate e-challans, relay alerts to nearby variable messaging boards, or send notifications through the 'Rajmargyatra' mobile app to nearby travellers. **These measures play an active role in disaster management by providing inputs for effective planning and implementation**. It will also provide online sharing of highway status and other important information that will help both the agencies and the highway users.

19.10.23

1) TV-D1 Mission: The Indian Space Research Organisation (ISRO) is set to launch its first-ever test flight, TV-D1, for the Gaganyaan mission, marking a pivotal moment in India's pursuit of human spaceflight**. Test Vehicle Abort Mission-1 (TV-D1) will evaluate the crew module's readiness for the Gaganyaan mission**. It is a single-stage liquid rocket developed specifically for this abort mission. **The payloads consist of the Crew Module (CM) and Crew Escape Systems (CES) with their fast-acting solid motors, along with CM fairing (CMF) and Interface Adapters**. This flight will simulate the abort condition during the ascent trajectory corresponding to a Mach number of 1.2 encountered in the Gaganyaan mission.

2) Niemann-Pick Disease: It is a rare genetic disorder in which sphingomyelin accumulates in lysosomes inside cells. This disease involves the dysfunctional metabolism of sphingolipids**. The three most commonly recognized forms are Niemann-Pick Types A and B and Type C.**
This disease can affect the brain, nerves, liver, spleen, bone marrow and, in severe cases, lungs. **People with this condition experience symptoms related to progressive loss of function of nerves, the brain and other organs**. It can occur at any age but mainly affects children. It is **inherited in an autosomal recessive pattern, which means both copies of the gene, must be defective to cause the disease**. Most often, the **parents of a child with an autosomal recessive disorder are carriers:** they have one copy of the altered gene but are not affected because the other copy produces the enzyme. If both parents are carriers, each pregnancy has a 25% chance of producing an affected child. Symptoms include Enlargement of the liver and spleen, Low levels of platelets in the blood, Slurring of speech, Difficulty in swallowing, Abnormal posturing of the limbs, trunk, and face, Voluntary rapid eye movements, and Gradual loss of intellectual abilities, dementia and seizures.

3) Automated Permanent Academic Account Registry (APAAR): APAAR, dubbed **'One Nation, One Student ID', is an Education Ecosystem Registry, or an 'EduLocker'**. The **APAAR will give each student enrolled from pre-primary to higher education**, a unique identification number. This will be in addition to the already existing Aadhaar ID that every individual has. Upon enrolling in APAAR, each student's identity will be authenticated through their Aadhaar ID or other officially recognised documents, and a distinct identification number will be generated for them. **The APAAR, or EduLocker will be a lifelong ID number for students for seamless tracking of their academic journey and achievements**. They will be able to digitally store their exam results, learning outcomes, co-curricular achievements such as ranking in Olympiads or receiving specialised skill training, and much more. Transcripts, certificates, and other academic achievements may be easily stored and accessed by students, boosting their capacity to apply for employment, scholarships, or higher education opportunities. In addition to that, students transferring from one school to another will face less hassle in obtaining admission to a new institution in any part of the country**. It would make it easier for authorities, educational boards, and institutions to track student progress, monitor performance, and assess the effectiveness of education policies. It will also help government agencies monitor dropouts.**
The enrolment process will be carried out by the school with the consent of their parents, who will also be able to withdraw their consent at any given point in time. The government assured that the data will be shared only with concerned government agencies if and when required.

20.10.23

1) Operation Nanhe Faristey: Under Operation 'Nanhe Faristey', **the Railway Protection Force (RPF) plays an important role in reuniting the children lost/separated due to several reasons from their families**. It was launched by Indian Railways, and under this drive, Children in need of care & protection who came into contact with Indian Railways were rescued and handed over to concerned authorities before being restored to their families.

2) Yuva Sangam: It is an initiative by **the Government of India to strengthen people-to-people connections between youth belonging to different States/UTs of India. Interested youth in the age group of 18-30 years**, mainly students, NSS (National Service Scheme)/NYKS (Nehru Yuva Kendra Sangathan) volunteers, employed/self-employed persons, etc. may register through the YUVA SANGAM portal to participate in the forthcoming Phase. It was **launched under EBSB and draws inspiration from the National Education Policy (NEP) 2020**. It is an ongoing cultural

exchange with the celebration of diversity at its core wherein participants gain an immersive experience of diverse facets of life, natural landforms, development landmarks, recent achievements, and youth connections in the host state. Under this, the **youth will receive multi-dimensional exposure in five broad areas will be provided to them, which are Paryatan (Tourism), Parampara (Traditions), Pragati (Development), Paraspar Sampark (People-to-people connect), and Prodyogiki (Technology).**

3) Regional Rapid Transit System: It has semi-high-speed rail connectivity at its core; the RRTS is an integrated mass transit network. It **aims to ensure "balanced and sustainable urban development" through better connectivity and access across the National Capital Region (NCR).** It was constructed by the National Capital Region Transport Corporation (NCRTC), which is a joint venture company of the Central government and the governments of Delhi, Haryana, Rajasthan, and Uttar Pradesh. It is **modelled on systems such as the RER in Paris, Regional Express trains in Germany and Austria, as well as the SEPTA Regional Rail in the United States, among others**. These trains will travel significantly faster than metro trains**. These will operate at a speed of 160 km/hour**. When compared with metros, the RRTS network is faster. It will cater to commuters who want to travel relatively longer distances across the NCR in a short time. **Compared with the Indian Railways, though the RRTS train will cover relatively smaller distances**, it will do so at a higher frequency and provide relatively more comfort than the average railway coach.

4) Chanakya Defence Dialogue: It aims to integrate intelligence, strategy, and expertise, fostering discussions on topics such as Neighbourhood Forces, the significant Indo-Pacific frontier, and the evolving impact of emerging technologies on defence and security. **The Indian Army is collaborating with the renowned think tank, Centre for Land and Warfare Studies (CLAWS), to organise the event**. This gathering will draw participants from a diverse range of nations, including **Australia, France, Japan, and the United States**. Scheduled as a two-day conference, the gathering will feature prominent speakers, military strategists, diplomats, and leading intellectuals in the fields of defence and strategic affairs. **Discussions will revolve around a broad spectrum of security challenges and strategies, focusing particularly on the pivotal regions of South Asia and the Indo-Pacific**.

21.10.23

1) Project Udbhav: Project Udbhav is a collaboration between the Indian Army and the United Service Institution of India (USI), a defence services think tank. **The project, named 'Udbhav', translates to 'origin' or 'genesis', recognizing the profound knowledge embedded in our nation's historical texts spanning centuries**. At its core, the project seeks to amalgamate ancient insights with modern military practices, creating a comprehensive approach to tackle present-day security challenges. **This initiative aims to bridge the gap between age-old wisdom and contemporary military education.** India's ancient knowledge system, rooted in a 5000-year-old civilizational legacy, boasts a repository of intellectual texts and manuscripts. **Project Udbhav, as per MoD, aims to facilitate a profound understanding of these systems and their enduring relevance in the modern era.**

2) Dam Safety Act: The **Dam Safety Act was tabled in the Rajya Sabha in December 2021,** as a response to deficient surveillance and maintenance causing dam failure-related disasters. The Act listed key responsibilities and mandated that national and State-level bodies be established for implementation. **A National Committee on Dam Safety would oversee dam safety policies and regulations; A National Dam Safety Authority would be charged with implementing and resolving State-level disputes; The Chairman of the Central Water Commission (CWC) would head dam safety protocols at the national level; A State Committee on Dam Safety (SCDS) and State Dam Safety Organisation (SDSO) would be set up**.

Provisions require States to: classify dams based on hazard risk, conduct regular inspections, create emergency action plans, Institute emergency flood warning systems, and undertake safety reviews and period risk assessment studies. States were asked to report and record incidents of dam failures.

Until now, no statutory provision required systemic reporting of failures and no single agency was tasked with tracking this data. The CWC keeps a record but the list is not updated regularly. Failure to comply with any provision of the Act is punishable by imprisonment and/or fines. If such obstruction or refusal to comply with directions results in loss of lives or imminent danger, the entity shall be punishable with imprisonment for a term which may extend to two years. In February 2023, the Sikkim High Court ordered the Gati Hydropower Project Company to pay ₹70 lakh to two widowed mothers, for non-compliance with the Dam Safety Act.

3) Guillain-Barre syndrome: It is a **rare autoimmune disorder** where the body's immune system mistakenly attacks the peripheral nerves. It is **more common in adults and males, but it can affect people of all ages**. The first symptoms of this syndrome include weakness

or tingling sensations. They usually start in the legs and can spread to the arms and face.
For some people, these symptoms can lead to paralysis of the legs, arms, or muscles in the face. It is often preceded by an infection. This could be a bacterial or viral infection.
The most frequently associated infections include Campylobacter jejuni, Epstein-Barr virus (EBV), cytomegalovirus (CMV), and the bacteria responsible for pneumonia and urinary tract infections. It may also be triggered by vaccine administration or surgery. There is no known cure for this syndrome. **The most commonly used treatment is intravenous immunoglobulin (IVIG)**, which is made from donated blood that contains healthy antibodies.
This helps calm down the immune system's attack on the nerves.

23.10.23

1) Competition Commission of India: It is a statutory body of the Government of India, and was established in March 2009 under the Competition Act, 2002. **The goal of CCI is to create and sustain fair competition in the economy that will provide a 'level playing field' to the producers and make the markets work for the welfare of consumers**. The priority of the Commission is to eliminate practices having adverse effects on competition, promote and sustain competition, protect the interests of consumers, and ensure freedom of trade in the markets of India. **The mandate is to implement provisions of The Competition Act, 2002, which– prohibits anti-competitive agreements and abuse of dominant position by enterprises; and regulates mergers and acquisitions (M&A),** which can have an adverse effect on competition within India. Thus, deals beyond a certain threshold are required to get clearance from CCI. It has the **composition of a quasi-judicial body**, with one chairperson and six additional members. All members of the CCI are appointed by the Central Government.
Headquarters: New Delhi.

2) Central Bureau of Investigation: The Central Bureau of Investigation (CBI) is the premier investigative agency of India. **The agency was established in 1963 by the Indian government as a result of the recommendation of the Santhanam Committee**. CBI is not a statutory **body. It derives its power to investigate from the Delhi Special Police Establishment Act, 1946. It operates under the jurisdiction of the Ministry of Personnel, Public Grievances and Pensions (which in turn operates under PMO).**
However, for investigation of offences under the Prevention of Corruption Act, the **CBI vests superintendence to the Central Vigilance Commission.** Initially, it was set up to investigate corruption in government departments and public sector undertakings. However, over the years, its jurisdiction has expanded to cover a wide range of cases, including economic offences, cyber-crimes, organized crimes, and special crimes.

3) Tribal Cooperative Marketing Development Federation (TRIFED): It is a **national-level organisation under the Ministry of Tribal Affairs,** primarily engaged in the development and marketing of tribal handicrafts and natural products. **It came into existence in 1987 and was registered under the Multi-State Cooperative Societies Act, 1984 (now the Multi-State Cooperative Societies Act, 2002).** The main mandate of TRIFED is capability enhancement for Tribals, promotion of tribal products, and creation of marketing opportunities for the Tribals with a view to ensuring remunerative prices for their products and augmenting their income on a sustainable basis. **The objective is to develop the socio-economic welfare of the tribal community**. It is to act as a facilitator and service provider for the tribal community to uplift production. **It is to provide training to enhance artistic skills with modern technology to meet the requirements of the global market**. To increase the promotion of tribal art and crafts for a stable livelihood. To identify target groups to monitor and evaluate the process and activities and provide input to the Ministry**. TRIFED has been doing the retail marketing of tribal products under the brand name "TRIBES INDIA".**TRIFED promotes and creates a sustainable market through retail outlets, exhibitions such as **Aadishilp, Aadichitra, and OCTAVE, international fairs, and e-marketing.** TRIFED has also been entrusted by the Government of India to implement its proposed Minimum Support Price Scheme for Minor Forest Produce.
Head Office: New Delhi.
It has a network of **pan India Regional Offices and a chain of TRIBES INDIA Retail Outlets.**

24.10.23

1) Small Savings Instruments (SSIs): These are a set of savings instruments managed by the central government with the aim of encouraging citizens to save regularly, irrespective of their age. They provide returns that are generally higher than bank fixed deposits. It also **gives a sovereign guarantee and tax benefits**. The interest rates on small savings schemes change on a quarterly basis. **All deposits received under various small savings schemes are pooled in the National Small Savings Fund.** These instruments can be classified under three headings: **Postal deposits (comprising savings accounts, recurring deposits, time**

deposits of varying maturities, and monthly income schemes (MIS).
Savings certificates (National Small Savings Certificate VIII (NSC) and Kisan Vikas Patra (KVP). Social security schemes (Public Provident Fund (PPF) and Senior Citizens' Savings Scheme (SCSS)). The money in the fund is used by the central government to finance its fiscal deficit.

2) Aadi Mahotsav: The Union Minister for Tribal Affairs will inaugurate the **Aadi Mahotsav - the National Tribal Festival at Ahmedabad, Gujarat.** The mega event is being **organised by the Tribal Cooperative Marketing Development Federation of India Limited (TRIFED**). It serves as a unique, symbiotic bridge to embark on a journey through the tapestry of India's indigenous heritage. In this event, a total of over 100 stalls would showcase the kaleidoscope of India's tribal culture, craftsmanship, culinary artistry, and economic endeavours. **This Aadi Mahotsav, besides other attractions of handicrafts, handloom, pottery, and jewellery, will be showcasing 'Millets grown by Tribals'.**

3) Pradhan Mantri Anusuchit Jaati Abhuyday Yojana: 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 aim is to reduce poverty in the SC communities by the generation of additional employment opportunities through Skill development, income-generating schemes and other initiatives. **The Scheme has three components:**
- Development of SC-dominated villages into an **"Adarsh Gram".**
- **Grants-in-aid for District/State-level Projects for socio-economic betterment of SCs**
- **Comprehensive Livelihood Projects** which may include components such as Skill development, related infrastructure development, financial assistance towards loans taken by beneficiaries for acquisition/creation of assets required for livelihood generation etc.

4) Exercise Harimau Shakti 2023: It is a **joint bilateral training exercise between the Indian and Malaysian Armed Forces.** The Malaysian Army contingent comprises troops from the 5th Royal Battalion of the Malaysian Army. **The Indian contingent is being represented by a battalion of the Rajput Regiment. Aim**: To enhance military capability for conducting Multi-Domain Operations in a sub-conventional scenario. During the exercise, both contingents will establish a Joint Command Post & establish an integrated surveillance grid along with a Joint Surveillance Centre.

25.10.23

1) International Migration Outlook 2023: Recently, the 'International Migration Outlook 2023' was released by the Organisation for Economic Co-operation and Development (OECD). **India saw the highest migration flows to Organisation for Economic Co-operation and Development (OECD) countries in 2021 and 2022**. In terms of nationalities, 0.13 million Indian citizens acquired the nationality of an OECD country in 2021. Inflows of refugees from Ukraine reached the highest level on record, OECD-wide, due to the ongoing Russia-Ukraine war; more than 10 million people have become either internally displaced or refugees in the OECD region.
In terms of workers, migration flows from India (+172 per cent), Uzbekistan (+122 per cent), and Turkey (+240 per cent) rose sharply, making them the primary countries of origin after Ukraine.

2) Organisation for Economic Co-operation and Development (OECD): It is an **international organisation of 38 countries committed to democracy and the market economy.** Its members are typically democratic countries that support free-market economies. It was **established on December 14, 1960**, by 18 European nations, plus the United States and Canada. **Goal**: To shape policies that foster **prosperity, equality, opportunity, and well-being** for all. It publishes economic reports, statistical databases, analyses, and forecasts on the outlook for economic growth worldwide. The **organisation also seeks to eliminate bribery** and other financial crimes worldwide. **It maintains a so-called "black list" of nations that are considered uncooperative tax havens.** India is one of the many non-member economies with which the OECD has working relationships in addition to its member countries. **Headquarters: Paris, France.**

3) Kasturi Cotton Bharat: It is a **joint initiative by the Ministry of Textiles, the Cotton Corporation of India, and Trade Bodies & Industry. Objective**: To work on the principle of self-regulation by owning complete responsibility for **Branding, Traceability and Certification of Indian Cotton to enhance its competitiveness in the global market and create a sustainable ecosystem for all stakeholders involved**. The website provides a digital platform for necessary information and updates on these initiatives and highlights the registration process for ginners to produce the Kasturi Cotton Bharat Brand. All the ginners in the country have been empowered to produce the Kasturi Cotton Bharat brand as per the

stipulated protocol. **The Cotton Textiles Export Promotion Council (TEXPROCIL) the apex body has been designated as the implementing agency for Traceability, Certification and Branding of "KASTURI Cotton India".**

4) Subscriber Identification Module (SIM) card: It is an **integrated circuit, or a microchip**, that identifies the subscriber on a given network. In order for a mobile phone to connect to any cellular network that follows the Global System for Mobile Communications (GSM) standard, a SIM card is mandatory. **This relationship is established using a unique authentication key—a piece of data that a user needs to 'unlock' access to the network**. Every SIM card stores this data, and it is designed such that the user can't access it through their phone. Instead, signals sent by the phone into the network are 'signed' by the key, and the network uses the signature to understand whether the phone's connection is legitimate. SIM cards also store information about their own ID number (the integrated circuit card identifier), the IMSI, the subscriber's location area identity (i.e. their current location), a list of preferred networks (to whom the subscriber can connect when roaming), and, emergency numbers.

26.10.23

1) Nancy Grace Roman Space Telescope: It will provide one of the deepest-ever views into the heart of our Milky Way galaxy. **It will have two instruments. Wide Field Instrument:** It will have a field of view that is 100 times greater than the Hubble infrared instrument, capturing more of the sky with less observing time. **Coronagraph Instrument**: It is a technology demonstration that will perform high-contrast imaging and spectroscopy of individual nearby exoplanets. For this, it will use infrared vision to peer through clouds of dust that can potentially block the view of the crowded central region of our galaxy. **This telescope plans to capture this by taking an image every 15 minutes around the clock for about two months**. This process will be repeated six times over Roman's five-year primary mission, which will total more than a year of observations. **Scientists will also conduct stellar seismology** studies on a million giant stars. This will help them learn about the star's structure, age and other properties.

2) Vajra Mushti Kalaga: It is a unique Indian martial art that incorporates various techniques of hand-to-hand combat like grappling, wrestling, and striking. T**he knuckleduster, also known as Vajra Mushti, is usually made of animal horns and worn on the knuckles of the fighter. The main objective of this Indian martial art form is to neutralise the opponent and counter his weapon.** It is a form of wrestling different from conventional grappling and entails two jetties taking a swipe at each other's heads with a knuckleduster. Whoever draws the blood from the opponent's head first is declared the winner. Th**is form of wrestling was popular during the period of the Vijayanagar rulers, who reigned between the 14th and the 17th centuries**. Medieval travellers from Portugal noticed this form of wrestling during the Navaratri celebrations in the Vijayanagar Empire and have left detailed accounts of it.

3) Pradhan Mantri Krishi Sinchayee Yojana: It was launched in 2015-16.**Aim**: To enhance physical access to water on farms, expand cultivable areas under assured irrigation, improve on-farm water use efficiency, and introduce sustainable water conservation practices. The Components include- Accelerated Irrigation Benefit Programme (AIBP): To focus on faster completion of ongoing Major and Medium Irrigation including National Projects.
Har Khet Ko Pani (HKKP): It consists of four sub-components, being Command Area Development & Water Management (CAD&WM), Surface Minor Irrigation (SMI), Repair, Renovation and Restoration (RRR) of Water Bodies, and Ground Water (GW) Development component. It also includes Per Drop More Crop (PDMC) and The Watershed Development component (WDC).Nodal Ministry: Ministry of Agriculture & Farmers Welfare.

4) United Nations Forum on Forests: The **Ministry of Environment, Forest and Climate Change is organising a Country-Led Initiative (CLI) event as part of the United Nations Forum on Forests (UNFF) at the Forest Research Institute (FRI), Dehradun, Uttarakhand.** It promotes the management, conservation, and sustainable development of all types of forests. It was **established in 2000 by the UN Economic and Social Council of the United Nations (ECOSOC).** The Forum meets annually at the **UN Headquarters in New York**, bringing together representatives of all member states and forest-related agencies for high-level dialogue on technical matters in odd years and policy matters in even years. The forum has universal membership and is composed of all Member States of the United Nations and specialized agencies. **India is a founding member of UNFF.**

27.10.23

1) Global Declaration for River Dolphins: In a ground-breaking development, **11 Asian and South American countries recently signed a global declaration, the "Global Declaration for River Dolphins," aimed at preserving the world's six remaining river dolphin species.** This declaration is designed to guide 14 nations where river dolphins inhabit, with a focus on responsible freshwater dolphin conservation. It aims to halt the decline of all river dolphin species and increase

the most vulnerable populations. The declaration will escalate collaborative endeavours to safeguard the surviving river dolphin species. **Countries that adopted the declaration include Bangladesh, Bolivia, Brazil, Cambodia, Colombia, Ecuador, India, Nepal, Pakistan, Peru, and Venezuela.** The countries involved agreed to improve water quality in the dolphins' habitat, create protected areas, tackle overfishing, and involve Indigenous communities in the affected regions in protecting the animals.

2) All India Management Association (AIMA): AIMA was created as an apex body of the management profession with the active support of the Government of India and Industry in 1957.**AIMA is a not-for-profit, non-lobbying organisation, that works closely with industry, government, academia, and students to further the cause of the management profession in India.** It is represented in a number of policy-making bodies of the Government of India and national associations. AIMA offers various services in the areas of testing, distance education, skill development & training, research, publications, executive education, and management development programmes. Apart from its flagship **Post Graduate Diploma in Management, AIMA offers topical and industry-oriented programmes and initiatives** to help management professionals and students keep in step with the times while offering state-of-the-art business solutions for organisations and institutions.

3) Banni festival: It is a traditional stick-fight. It is **celebrated on the night of the Dussehra celebration (Vijaya Dasami) every year.** The **objective of this event was to snatch the idols from God's team, leading to a fierce battle known as the Banni Fight.** This festival was celebrated by people under the Vijayanagara Empire. It **is celebrated on account of the victory of Lord Mala Malleswara Swamy and Goddess Parvati over demonish Mani and Mallasura**, who troubled the people in the Devaragattu region. The ritual takes place at midnight when the procession idols of the ruling deities **Malamma (Parvati) and Malleshwara Swamy (Shiva) are brought down the hill temple at Neraneki.** Devotees carry long sticks or lathis with them to hit each other with these sticks on the head. The basic idea of this fight is to capture the procession idol.

4) Primary Agricultural Credit Society (PACS): P**ACS are village-level cooperative credit societies that serve as the last link in a three-tier cooperative credit structure headed by the State Cooperative Banks (SCB) at the state level.** Credit from the SCBs is transferred to the District Central Cooperative Banks (DCCBs), which operate at the district level. The DCCBs work with PACS, which deals directly with farmers. Since these are cooperative bodies, individual farmers are members of the PACS, and office-bearers are elected from within them. A village can have multiple PACS.PACSs provide short-term, and medium-term agricultural loans to the farmers for the various agricultural and farming activities. **The first PACS was formed in 1904.**
Currently, there are more than 1,00,000 PACS in the country with a huge member base of more than 13 crore farmers. However, only 63,000 of them are functional.

28.10.23

1) Subsurface Water Ice Mapping (SWIM) project: It aims to locate the best places to access water ice buried under the Martian surface. T**he recently released fourth set of maps is the most detailed and accurate since the project started in 2017. It is led by the Planetary Science Institute in Tucson, Arizona**, and managed by NASA's Jet Propulsion Laboratory in Southern California. **The project uses data from several NASA missions, such as the Mars Reconnaissance Orbiter (MRO), the 2001 Mars Odyssey, and the defunct Mars Global Surveyor.** SWIM used two higher-resolution cameras on MRO. The Context Camera data was used to improve the maps of the Northern Hemisphere. For the first time, the HiRISE (High-Resolution Imaging Science Experiment) data was used to provide the most detailed view of the ice's edge as close to the equator as possible. **The first phase of the SWIM project, completed in 2019, focused on the northern hemisphere. The second phase, completed in 2020, includes the southern hemisphere.** The **new map includes sightings of so-called "polygon terrain,"** where the seasonal expansion and contraction of subsurface ice causes the ground to form polygonal cracks, indicating more ice hidden beneath the surface.

2) Talagirishwara Temple: It is located in **Panamalai village of Viluppuram district in Tamil Nadu, India**. The temple is constructed on an insignificant, small hill overlooking the Panamalai Lake. **The temple was constructed by Pallava king Narasimhavarman II, popularly known as Rajasimha.** This Seventh Century's structure incorporates a Vimana that resembles that of the Kailasanatha temple in Kanchipuram. The garbhagriha stocks a Dharalingam, and as in Pallava temples of that period, there is a Somaskanda section on the hindmost wall of the shrine. **It includes an Ardhamandapam (partial Mandapam).** The walls of the Ardhamandapam post panels of divinities, **including Brahma with Saraswati and Vishnu with Lakshmi on either flank.** The temple faces east and the garbhagriha is enclosed on all three sides by sub-shrines. **Some more sub-shrines and a Maha-mandapam (a massive Mandapam) were added in the later period to the structure.** The Vimana is 3 layered

and the high tier has also been rebuilt. **The typical Pallava mark, pillars with crouching lions, is also found.** The paintings in this temple bear a close resemblance to the paintings in Ajantha and Chithannavasal. **The paintings are on the wall of a sub-temple on the northern side of the Talagirishwara (Siva) temple. There is a painting of Lord Shiva with eight hands dancing known as Latathilagabhan**i, being watched by Goddess Parvathi with her crown and well-decorated umbrella. These paintings were older than Chithannavasal paintings. These paintings were created after covering the stonewalls with a paste made of limestone and sand.

3) Lower Subansiri Hydroelectric Power Project: It is the **biggest hydroelectric project** undertaken in India so far. It is a **run-of-river scheme on the river Subansiri**. The **Project is located near North Lakhimpur** on the border of Arunachal Pradesh and Assam.
Capacity: 2000MW. It will generate up to 7.4 billion kWh of electricity annually. The project includes the construction of a surface powerhouse and a concrete gravity dam that is 116m-high from the river bed level. **The length of the dam will be 284m. The dam is located in the Dhemaji district of Assam, while the powerhouse is located in the Subansiri district of Arunachal Pradesh.** It is **being developed by the state-run National Hydro Power Corporation (NHPC).** The project cost was met through 70% equity and 30% debt financing through the provision of a term loan. The central government is providing budgetary support as part of the equity component.

30.10.23

1) Hostile Activity Watch Kernel (HAWK) system: It is a **Cloud-Based Information Management System** designed to manage interlinked databases of wildlife crime, wildlife criminals, and wildlife mortality. It will help officials analyse the information and develop actionable intelligence to prevent wildlife crimes and curb the Illegal Wildlife Trade (IWT). The system connects the entire state forest department in real-time and the access is restricted through access levels. This is a **large ERP model cloud-based system that uses mobile and desktop interfaces to manage data**. **The entire HAWK system is divided into various modules that are interconnected with individual stand-alone functions**. This enables the system to be scaled up or down as per the needs of the state forest department and ensures customization opportunities for each state to accommodate the changes in procedures and also to accommodate the interface in regional languages. All the data managed by the HAWK system is secured with the government and industry-standard security measures are applied to ensure data security. **The development of HAWK started in 2017 in the state of Kerala by a joint team of the Kerala Forest Department Wildlife Trust of India**. The **system was officially launched in 2019 in Kerala, and since then it has been the official system of the state forest department.** The implementation of a customised version of HAWK was initiated in 2022 in Karnataka in partnership with the ICT cell of Karnataka Forest Department, and the system is being implemented across the state.

2) Exercise KAZIND-2023: It is the **7th edition of the Kazind exercise**. The Joint Exercise between India and Kazakhstan was instituted as 'Exercise PRABAL DOSTYK' in the year 2016. **After the second edition, the Exercise was upgraded to a company-level exercise and renamed as 'Exercise KAZIND'.** The Exercise has been further upgraded as a Bi-service Exercise this year by including the Air Force component**. In this edition of the Exercise, both sides will practise the conduct of Counter Terrorism operations in a sub-conventional environment under the United Nations mandate**. The contingents will jointly rehearse various tactical drills including Raid, Search and Destroy Operations, Small Team Insertion and Extraction operations, etc. **The scope of the Exercise also includes conduct of Counter Unmanned Aerial System Operations.** 'It will provide an opportunity for both sides to gain insight into the tactics, battle drills, and procedures of each other, which is a prerequisite while operating under the ambit of the United Nations. **The joint training will develop the necessary skills, resilience, and coordination to conduct joint military operations in Semi-Urban and Urban environments.**

3) United Nations Interim Force in Lebanon: Originally, UNIFIL was created by the **Security Council in March 1978 after Israel's invasion of Lebanon.** According to Security Council resolutions 425 (1978) and 426 (1978) of March 1978, **UNIFIL was established to:** Confirm the withdrawal of Israeli forces from southern Lebanon, Restore international peace and security, Assist the Government of Lebanon in ensuring the return of its effective authority in the area. **The mandate had to be adjusted twice, due to the developments in 1982 and 2000.** It has around 10,500 peacekeepers coming from 48 troop-contributing countries. The mission maintains an intensive level of operational and other activities amounting to approximately 14,500 activities per month, day and night, in the area of operations. **Seventeen per cent of activities are carried out jointly with the Lebanese Armed Forces.** UNIFIL is complemented by a five-vessel Maritime Task Force. UNIFIL is funded through a separate account approved on an annual basis by the General Assembly. It is a **part of the UN peacekeeping force.**

31.10.23

1) Section 295A of the IPC: The **object of Section 295-A is to punish deliberate and malicious acts intended to outrage the religious feelings of any class by insulting its religion or religious beliefs**. This section only punishes an aggravated form of insult to religion when it is perpetrated with the deliberate and malicious intention of outraging the religious feelings of a class. The accused must insult or attempt to insult the religion or religious beliefs of any class of citizens of India. The said insult must be made with a deliberate and malicious intention of outraging the religious feelings of the said class of citizens. The said insult must be by words, either spoken or written, by signs, by visible representation, or otherwise.

Section 295A IPC is a cognisable, non-bailable, and non-compoundable offence, and police can register an FIR anywhere in the country at the instance of purportedly aggrieved complainants.

2) District Central Co-operative Banks (DCCBs): A DCCB is a **rural cooperative bank operating at the district level in various parts of India.** It was established to provide banking to the rural hinterland for the agricultural sector, with the branches primarily established in rural and semi-urban areas**. DCCB provides finance to all the cooperative societies in the district, conducts activities, and provides banking services according to the provisions of the cooperative Act and Banking Act.** They **act as a link between the primary credit cooperative society and the State Co-operative Bank.** At the district level, DCCB works as a banker of state government. **Educational institutions, Zilla Parishad, Panchayat Samiti, Gram Panchayat, cooperative societies, etc. have accounts in this bank.** All the financial transactions of the cooperative sector are conducted through DCCB.

DCCBs have three sources of funds:

Their own share capital and reserves, Deposits from the public and Loans from the state cooperative banks.

The main functions of the DCCBs are: To meet the credit requirements of member societies, To perform banking business, to act as a balancing centre for the Primary Agricultural Credit Societies (PACS) by diverting the surplus funds of some societies to those that face shortages of funds, to undertake non-credit activities.

3) SIM-Swap Scam: All banking applications are linked to phone numbers, which help in generating OTPs (to authenticate transactions) or receiving important bank-related messages.

In the SIM swap scam, **fraudsters first take personal details such as phone numbers, bank account details, and addresses with the help of phishing or vishing**. After receiving the personal information, fraudsters visit the mobile operator's retail outlet, posing as the victim with forged ID proof, and report a fake theft of the victim's SIM card and/or mobile phone.

By doing this, they attain a duplicate SIM. Notably, scamsters can get a duplicate SIM even when the original is working, as they reported a theft of the original SIM card. **Unlike other scams, where scamsters trick people into giving OTPs and private information on a phone call, the SIM swap scam doesn't require direct communication with the victims.** However, fraudsters do give missed calls to their victims so that the latter leave their phones and ignore the lost network connectivity. When the SIM is swapped, the accused gains control of the entire SIM. All calls and messages go through their SIM only. Once in control of the SIM card, they are able to obtain passwords and OTPs that allow them to access their targets' bank accounts.

Places in News

1) Maldives (Capital: Male)

- **Mohamed Muizzu** was elected as the New Maldives President.
- **Political Boundaries:**
  - The northernmost atoll is about **370 miles** south-southwest of the Indian mainland.
  - The central area, including the **capital island of Male**, is about 400 miles southwest of Sri Lanka.
- **Geographical features:**
  - The **Maldive Islands are a series of coral atolls** built up from the crowns of a submerged ancient volcanic mountain range.
  - All the **islands are low-lying**, none rising to more than 6 feet above sea level.
  - **Barrier reefs protect the islands from the destructive effects of monsoons.**
  - The atolls have sandy beaches, lagoons, and a luxuriant growth of coconut palms.

2) Slovakia (Capital: Bratislava)

- Slovakia's leftist election winner **Robert Fico** got a two-week window to negotiate a coalition government.
- **Political Boundaries:**
  - **Landlocked country** of central Europe.
  - Bordered by **Poland** (north), **Ukraine** (east), **Hungary** (south), **Austria** (southwest) and **Czech Republic** (west).
- **Geographical features:**
  - **Highest peak**: Gerlach Peak.
  - **Major River**: Váh River, Danube River.
  - **Major Lakes**: Lake Orava, Velke Hincovo Pleso.

3) Pangong Tso Lake: Pangong Lake (at 4,350m height) is an **endorheic (landlocked) lake in Leh Ladakh**.

- It is the **world's highest saltwater lake**.
- It falls in **Eastern Ladakh and West Tibet** (1/3rd of the lake lies in India and the remaining 2/3rd in China).
- It is also **known to change colours** (appears blue, green and red at different times).
- It is not a part of the Indus River basin.
- Formerly, Pangong Lake had an outlet to **Shyok River** (a tributary of the Indus) but it was closed off due to natural damming.

4) Syria (Capital: Damascus) –

- Turkey steps up strikes on militants as conflict escalates in Syria
- **Political Boundaries:**
  - Bounded by **Turkey** (north), **Iraq** (east and southeast), **Jordan** (south), **Lebanon and Israel** (southwest).
- **Geographical features:**
  - It has a **short coastline along the Mediterranean Sea**.
  - Its area includes territory in the Golan Heights that has been occupied by Israel since 1967.
- **Highest Point:** Mount Hermon.
- **Longest River:** The Euphrates River.
- **Largest lake:** Lake Assad.

5) Spain (Capital: Madrid) –

- Mass protests were organised in Barcelona against possible amnesty for Catalan separatists.
- Catalonia is an **autonomous region in the north-eastern Spain**.
- **Political boundaries of Spain**:

- Bordered Portugal (West); France (North East), Andorra.
- Bounded by the **Mediterranean Sea** (east), **Atlantic Ocean** (northwest), and **Bay of Biscay** (north).
- The **Canary Islands** (in the Atlantic Ocean), and **Balearic Islands** (in the Mediterranean), and two enclaves in North Africa also are parts of Spain.

- **Geographical features:**
  - Occupies about **85% of the Iberian Peninsula**.
  - Major Mountain ranges **Central Sierra, Cantabrian. Mountains, Sierra Morena, Pyrenees**.
  - **Major River:** Ebro River.

6) Italy (Capital: Rome)

- India and Italy signed a pact to deepen defence cooperation.
- **Political Boundaries:**
- Country of south-central Europe.
- Surrounded by the **Mediterranean Sea**, in particular by the **Adriatic Sea** (northeast), **Ionian Sea** (southeast), **Tyrrhenian Sea** (southwest), and **Ligurian Sea** (northwest).
- Bordered by France, Switzerland, Austria, and Slovenia.
- **Geographical features:**
- **Highest Peak:** Mont Blanc.
- **Major Rivers:** Po River (longest), Adige, Tiber etc.

7) Ecuador (Capital: Quito)

- **Daniel Noboa**, 35, was elected Ecuador's youngest president.
- **Political Boundaries:**
  - Ecuador is a **republic** in north-western South America.
  - Bordered by **Columbia and Peru**.
  - The Pacific Ocean is located on the west side.
- **Geographical Features:**
  - Situated on the **Equator** from which its name derives.
  - Cotopaxi in the Andes Mountains is one of the highest active volcanoes in the world.
  - Significant oil reserves and is **one of South America's top oil producers.**
  - **Highest Peak:** Chimborazo.
  - **Major rivers:** Napo, Pastaza, etc.

8) Marshall Islands (Capital: Majuro):

- The United States signed a **new 20-year agreement on economic assistance to the Marshall Islands.**
- **Political Boundaries:**
  - The island country is located in the **Central Pacific Ocean**, about halfway between Hawaii and Australia.
  - Nearest neighbours are **Wake Island** (north), **Kiribati** and **Nauru** (south), and the **Federated States of Micronesia** (west).
- **Geographical Features:**
  - Situated in two, almost-parallel island chains - the **Ratak (Sunrise) group and the Ralik (Sunset) group.**
  - **Largest atoll:** Kwajalein.
  - Home to the **world's largest shark sanctuary**.

9) Lao PDR:

- Lao PDR is now the second country after Bangladesh to eliminate lymphatic filariasis (LF) in 2023.
- **Lao PDR (Capital: Vientiane).**
- **Political Boundaries:**
  - Laos is a **landlocked country** in northeast-central mainland Southeast Asia.
  - Laos is bounded to the north by China, to the northeast and east by Vietnam, to the south by Cambodia, to the west by Thailand, and to the northwest by Myanmar.
- **Geographical Features:**
  - Dominating the landscape are its **inhospitable forest-covered mountains.**
  - **The highest point:** The Phu Bia (9245 feet).
  - **Major River:** The Mekong.

10) Australia (Capital: Canberra):

- Recently, Australians rejected creating an Indigenous Voice in the final referendum voting.
- **Political Boundaries:**
  - It is the **smallest continent and one of the largest countries on Earth** lying between the Pacific and Indian oceans in the Southern Hemisphere.
- **Geographical features:**
  - **Highest point:** Mount Kosciuszko.
  - **Lowest point:** Lake Eyre, also called Kati Thanda.
  - A chain of highlands, known as the **Great Dividing Range runs from inland to coast**.
  - **The longest river:** Murray River.

11) Zambia (Capital: Lusaka):

- Indian Defence Secretary held a meeting with the **Permanent Secretary, Ministry of Defence, Zambia.**
- **Political Boundaries:**
  - It has a **land border on the west with Angola**.
  - To the southwest is the **thin projection of Namibian territory known as the Caprivi Strip, at the eastern end of which Zambia and three of its neighbours (Namibia, Botswana, and Zimbabwe) appear to meet at a point - a "quadripoint".**
  - Mozambique to the southeast, Malawi to the east, Tanzania to the northeast and DRC to the Northwest.
- **Geographical Features:**
  - It is a **landlocked country in south-central Africa**.
  - Situated on a high plateau and takes its name from the Zambezi River.
  - **Highest point:** Mafinga Central.
  - **Longest River:** Kafue River (a tributary of the Zambezi River).

12) Serbia (Capital: Belgrade):

- Envoys of the EU and USA urged **Kosovo and Serbia** to resume dialogue to ease soaring tensions.
- **Kosovo declared independence in 2008 from Serbia**, but Serbia has refused to recognize the move.
- **Political boundaries**
  - A land-locked country in the west-central Balkans.

Bordering:

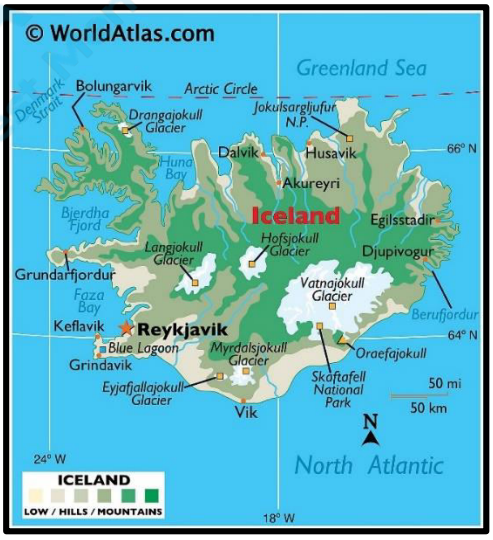
- **Bosnia and Herzegovina**, Croatia (West), Hungary (north), Romania and Bulgaria (east), North Macedonia (south), Montenegro (southwest), and Albania (south).
- **Geographical features:**
  - Western margins include sections of the Dinaric Alps, and eastern borderlands are part of the Carpathian and Rhodope Mountain systems.
  - **Major rivers:** Danube, Tisa, Morava.
  - **Highest point:** Midžor.

13) Benin (Capital: Porto-Novo):

- MEA said India is **Benin's largest trade partner and significant investor**.
- **Political boundaries:**
  - Burkina Faso (northwest), Nigeria (east), Togo (west), Niger (North), Atlantic Ocean (South).
  - The **Bight of Benin is a bay in the Atlantic Ocean** bordering Benin.
  - Niger River forms Benin's border with Niger.
- **Geographical features:**
  - Atakora Mountains in the northwest, form a continuation of the Togo Mountains to the south.
  - **Other major rivers:** Mono, Couffo, and Ouémé.
  - **Highest point:** Mount Sokbaro.

14) Iceland (Capital: Reykjavík)

- The Prime Minister of Iceland joined the women on strike over equal pay.
- **Political Boundaries:**
  - An **island country in the North Atlantic Ocean** is located between Greenland and Norway.
  - **Iceland is a member of NATO.**
  - Its coastline meets the **Greenland Sea** (north), **Norwegian Sea** (east), **Atlantic Ocean** (south and west), and **Denmark Strait** (which separates it from Greenland on the northwest).
- **Geographical features:**
  - **Highest point:** Hvannadals Peak.
  - **Longest River:** The Þjórsá River.
  - **Climate:** Affected by the confluence of two ocean currents i.e. Gulf Stream from near Equator, and East Greenland Current.



15) Bering Sea:

- A recent study revealed a link between declining Bering Sea ice and increasing wildfire hazards in northeast China.
- The **Bering Sea is a marginal sea** (located along the continental margins) in the northern Pacific Ocean and separates North America and Asia.
- It is bordered by **the US, Kamchatka Peninsula, Russia, chain of the Aleutian Islands**.

- It is connected with the **Chukchi Sea of the Arctic Ocean via the Bering Strait.**
- **Deepest point:** In Bowers Basin at a depth of 4,097 m.
- **Rivers draining:** Anadyr and Yukon Rivers.

16) Venezuela (Capital: Caracas):

- The US agreed to ease sanctions against Venezuela's oil, gas and mining industries.
- **Political boundaries:**
  - Bounded by the **Caribbean Sea and Atlantic Ocean** (North), **Guyana** (East), **Brazil** (South), and **Colombia** (Southwest and West).
  - Administers a number of Caribbean islands and archipelagos, like **Margarita Island, La Blanquilla, La Tortuga, Los Roques, and Los Monjes.**
- **Geographical features:**
  - Andes Mountains and Maracaibo Lowlands in the northwest; central plains (llanos); Guiana Highlands in the southeast.
  - **Home to one of the world's largest oil reserves.**
  - **Highest point:** Pico Bolivar 4,978m.
  - **Major Rivers:** Rio Negro; Orinoco River.
  - **Major Lake:** Lake Maracaibo.

17) Qatar (Capital: Doha):

- A court in Qatar sentenced eight former personnel of the Indian Navy to death.
- **Political Boundaries:**
  - It is a **country in West Asia**.
  - It **shares its sole land border with Saudi Arabia** with the rest of the territory being surrounded by the Persian Gulf.
- **Geographical Features:**
  - Situated on the west coast of the Persian Gulf and the Qatar peninsula.
  - It has **one of the world's largest reserves of petroleum and natural gas**.
  - Sand-dunes and salt flats, or sabkhahs, are the chief topographical features.
  - **No permanent bodies of fresh water.**
  - **Highest point:** Abū al-Bawl Hill.

3rd October

1) Delimitation Commissions have been set up four times **1952, 1963, 1973 and 2002** under the Acts of **1952, 1962, 1972 and 2002.**

2) The **Indian pharmaceutical industry is the 3rd largest pharmaceutical industry** in the world by volume with a current market size of around USD 50 Billion.

3) A surety bond can be defined in its simplest form as a **written agreement to guarantee compliance, payment, or performance of an act.** It is a unique type of insurance because it involves a three-party agreement (between Principal, Surety and Obligee).

4th October

1) **India retains 40th rank out of 132 economies in the Global Innovation Index 2023** rankings published by the World Intellectual Property Organization (WIPO).

2) Gandhi was chosen for banknotes because of his national appeal, and in **1996, a new 'Mahatma Gandhi Series' was launched by the RBI** to replace the former Ashoka Pillar banknotes.

3) Cookies are files generated by the websites a user visits and serve the purpose of retaining information regarding the user's interactions and preferences during their online navigation. They can be categorised as **session cookies, persistent cookies, secure cookies and third-party cookies.**

5th October

1) Atoms in molecules exhibit movements on the order of femtoseconds, which are incredibly short time intervals, constituting a millionth of a billionth of a second. E**lectrons, being lighter** and interacting even faster, operate within the attosecond realm, a billionth of a billionth of a second (1×10^−18 of second).

2) In the ongoing financial year (2023-24), **social audit units flagged misappropriation amounting to ₹27.5 crore under MGNREGA.**

3) The very name Nilgiris' with the literary meaning **'blue mountains' has originated from the appearance of blue flower-clad mountains** (Neelakurinji flowers) of the Nilgiris plateau within the State of Tamil Nadu.

6th October

1) Total FDI inflows in the country in the last 23 years (April 2000-March 2023) are $919 bn.

2) **Ruminant livestock and manure managemen**t contribute to approximately 32% of global anthropogenic methane emissions. Rice paddies account for an additional 8% of methane emissions.

3) According to the Center for Strategic and International Studies (CSIS), **80% of global trade by volume and 70% by value is transported by sea, with 60% of it passing through Asia** and one-third of global shipping moving through the South China Sea.

4) Four African countries accounted for just over half of all malaria deaths worldwide: **Nigeria** (31.3%), the **Democratic Republic of the Congo** (12.6%), the **United Republic of Tanzania** (4.1%) and **Niger** (3.9%).

7th October

1) Evergreening of patents is a **strategy to extend the term of a patent by obtaining new patents before the original one expires**. Evergreening is not allowed under Indian patent law.

2) According to the World Health Organization's (WHO) weekly **Epidemiological Record**, the World reported more than twice as many cholera cases in 2022 as it did in 2021.

3) In the **Cadila Healthcare Limited vs. Cadila Pharmaceuticals Limited case, 2001** the Supreme Court ruled that passing off is a form of unfair trade competition through which one party attempts to benefit from the reputation established by another in a particular trade or business.

9th October

1) **A total of 107 Members of Parliament (MPs) and Members of Legislative Assembly (MLAs)** have hate speech cases registered against them.

2) Peak flows during GLOFs have been recorded as high as 15,000 cubic meters per second (as per National Disaster Management Authority).

3) The **Iranian law** strictly recommends **women to wear hijabs or headscarves with their regular outfits**. Anyone not following this is recently being arrested, warned, or punished severely. Mahsa Amini, a 22-year-old youth, was arrested for breaching the dress code of Iranian women leading to the Mahsa Amini Protests (Iranian Hijab Movement).

10th October

1) A wilful defaulter means a borrower or a guarantor who has committed a wilful default and the outstanding amount is ₹ 25 lakh and above.

2) The **Arabian Sea accounts for about 2% of the annual global mean of tropical cyclones** but poses a considerable threat due to its densely populated coastlines.

3) In August 2021, **Afcons, an Indian company**, signed a contract for the largest-ever infrastructure project in Maldives which is the Greater Male Connectivity Project (GMCP).

11th October

1) Recently, the **United Kingdom's first uterus transplant was conducted**, providing new hope for women facing reproductive challenges.
2) **India's Dehyphenation Policy on Israel-Palestine:** India's policy on the longest-running conflict in the world has gone from being unequivocally pro-Palestine for the first four decades to a tense balancing act with its three-decade-old friendly ties with Israel. In recent years, India's position has also been perceived as pro-Israel.
3) **India has become the third-largest domestic aviation market in the world**. India's airport capacity is expected to handle 1 billion trips annually by 2023.

12th October

1) **Two out of every five amphibian** species are threatened with extinction.
2) In India, according to **National Institute of Mental Health and Neuro-Sciences data**, more than 80% of people do not access care services for a multitude of reasons, ranging from lack of knowledge, stigma and high cost of care.
3) **Arunachal Pradesh has recently received the Geographical Indication (GI) tag for Arunachal Yak Churpi, Khaw Tai** (Khamti rice), and **Tangsa textile**.

13th October

1) **OpenAI is working on a project named "Gobi,"** which aims to create a multimodal AI system from scratch, distinct from the GPT models**. Another major player in the field is Google' new yet-to-be-released multimodal large language model Gemini.**
2**) Many areas in Punjab may go dry after 2029** and the state has already over-exploited its groundwater for irrigation purposes as it fills granaries of the Centre by growing wheat and paddy worth ₹ 70,000 crore every year.
3) As of June 2022, there are over 10.52 Lakh ASHAs in all states/UTs (except Goa). **Generally, there is "1 ASHA per 1000 population".**

14th October

1) According to a recent study conducted by the World Bank, **human settlements in some of the world's riskiest flood zones have increased by a staggering 122% since 1985**, contributing to the vulnerability of millions to water disasters induced by climate change.
2) **Justice V.S. Malimath Committee on Reforms of the Criminal Justice System** emphasised that the "successful prosecution of the guilty depends on a thorough and careful search for truth and collection of evidence which is both admissible and probative".
3) **Four types of CPI are CPI for Industrial Workers (IW). CPI for Agricultural Labourer (AL). CPI for Rural Labourer (RL). CPI for Urban Non-Manual Employees (UNME)**. Of these, the **first three are compiled by the Labour Bureau** in the Ministry of Labour and Employment. **Fourth is compiled by the National Statistical Office (NSO)** in the Ministry of Statistics and Programme Implementation.

15th October

1) The term **"R-EVM" stands for "Remote Electronic Voting Machine."** It is a **proposed system by the Election Commission of India (ECI) aimed at facilitating voting for domestic migrants** who are unable to vote in their home constituencies due to their current location away from their registered constituencies.
2) The **Periodic Labour Force Survey is a survey conducted by the NSO** under the Ministry of Statistics and Programme Implementation (MoSPI) to measure the employment and unemployment situation in India.
3) Properties of Quantum Computing:
a) **Superposition** – a qubit can exist in a superposition of both states, meaning it can represent both 0 and 1 simultaneously,
b) **Entanglement** – Quantum entanglement is a phenomenon where the quantum states of two or more qubits become correlated in such a way that the **state of one qubit instantly affects the state of another, even when they are separated by vast distances.**

16th October

1) The **Holocaust** resulted in the tragic loss of approximately six million Jewish lives, along with numerous other atrocities such as **concentration camps, and mass deportations**.
2) **India ranks 4th globally in terms of iron ore production** and is the world's 2nd largest coal producer as of 2021.
3) Ethnic violence has been a significant concern in **Manipur**, resulting in the tragic loss of over 175 lives since May 3, 2022. **Manipur has witnessed as many as 137 insurgency-related incidents** out of the total 201 recorded in the north-eastern states in 2022.

17th October

1) Globally, approximately 580 million tonnes of methane are emitted annually. **Human activities contribute to 60% of these emissions.**
2) The **MTP Act was amended in 2021 to allow certain categories of women, such as rape victims, minors, mentally ill women, etc., to obtain abortions up to 24 weeks of gestation**, raising it from the previous 20 weeks. It sets up state-level Medical Boards to decide if a pregnancy may be terminated after 24 weeks in cases of substantial fetal abnormalities.
3) **Shafin Jahan v. Asokan K.M. and Others Case 2018:** While referring to A**rticle 16 of the Universal Declaration of Human Rights and the Puttaswamy case,** the SC held that the right to marry a person of one's choice is integral to Article 21 of the Constitution.

18th October

1) China's trade with BRI partners registered an annual growth rate of 6.4%, reaching USD 19.1 trillion between 2013 and 2022.

2) Only the political parties registered under **Section 29A of the Representation of the People Act, 1951** and have **secured not less than 1% of the votes** polled in the last general election to the House of the People or the Legislative Assembly, are eligible to receive electoral bonds.

3) **FCRA registration is valid for five years**, and NGOs are required to apply for renewal within six months of the registration's expiry. **Once FCRA registration is cancelled, an NGO is ineligible for re-registration for three years.**

19th October

1) When the Constitution was adopted, **contempt of court was made one of the restrictions on freedom of speech and expression under Article 19 (2) of the Constitution of India. Article 129** of the Constitution conferred on the **Supreme Court the power to punish contempt of itself. Article 215** conferred a corresponding power on the High Courts, along with the **Contempt of Courts Act, 1971 giving a statutory backing.**

2) The **Alvars** were a group of **twelve Vaishnava (devotees of Lord Vishnu) saint-poets**. The Alvars' devotional hymns and poems were collected in the **Naalayira Divya Prabandham**. The **Nayanars were a group of sixty-three Shaiva (devotees of Lord Shiva) saint-poets**. The Nayanars' hymns and poems were collected in the **Thirumurai**, a corpus of Shaivite scriptures.

3) Angel tax is an i**ncome tax levied at the rate of 30.6% when an unlisted company issue shares to an investor at a price higher than its fair market value**. Fair market value is the price of an asset when the buyer and seller have reasonable knowledge of it and are willing to trade without pressure.

20th October

1) In 2020, global agrifood systems emissions were 16 billion tonnes of carbon dioxide equivalent, an increase of 9 % since 2000.

2) The **International Space Station,** currently managed by the **US, Russia, Canada, Japan, and European space agencies**, is anticipated to be decommissioned by 2030.

3) **India is the third country to report the occurrence of TiPV (Tilapia Parvovirus).** TiPV has caused mortality rates ranging from 30% to 50% on fish farms. In laboratory settings, it has led to 100% mortality, highlighting its devastating impact.

23rd October

1) The infamous "**Aaya Ram, Gaya Ram" slogan** was coined against the background of continuous defections by the legislators in the 1960s and encouraged the passage of the Anti-Defection Law through the **52nd Constitutional Amendment Act, 1985.**

2) Comprising about 40% of Brazil's total area, Peru, and also parts of Guyana, Colombia, Ecuador, Bolivia, Suriname, French Guiana, and Venezuela, the **Amazon River Basin is the world's largest drainage system**.

3) Indigenous Australians are the original inhabitants of the continent, with a history dating back at least 45,000 years. However, European colonization in the 18th century had severe and lasting impacts on these communities. **These communities account for only 3.8% of the Australian Population today.**

24th October

1) The Supreme Court in a landmark judgment in the **Vishakha and others v State of Rajasthan 1997 case gave 'Vishakha guidelines'.** These guidelines formed the basis for the **Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.**

2) The annual SDG funding gap, which was USD 2.5 trillion before the pandemic, has now increased to an estimated USD 4.2 trillion, emphasizing the urgent need for substantial investment in achieving the SDGs.

3) The **World Bank, established in 1944, has committed USD 97.6 billion in lending to India**, encompassing both active and closed projects. Out of the total commitments, 19% has been dedicated to projects in the public administration sector, 15% to agriculture, fishing, and forestry, and 11% to the transport sector.

25th October

1) Marine cloud brightening (MCB) seeks to **boost marine cloud reflectivity (albedo), making clouds whiter and brighter.** It involves using water cannons or specialized vessels to release fine seawater droplets into the atmosphere. As these droplets evaporate, they leave behind salt particles, serving as cloud condensation nuclei that foster the formation of denser, brighter clouds.

2) In the **TV-D1 flight by ISRO, the Crew Escape System separates from the Test Vehicle at around 11.7 km altitude.** After approximately 90 seconds, the crew module detaches, deploys parachutes, and descends slowly over seven minutes. **The Indian Navy will recover the crew module from the Bay of Bengal**, marking a crucial milestone in the Gaganyaan program's development.

3) According to the International Monetary Fund (IMF), **India's contribution to global economic growth is expected to rise by 2%,** as 16% contribution will grow

to 18% in the next five years due to India growing faster.

26th October

1) The Organization for Economic Cooperation and Development (OECD) developed a proposal featuring a corporate **minimum tax of 15%** on foreign profits of large multinationals, which would give countries new annual tax revenues of USD 150 billion.
2) The **Supreme Court, in Joseph Shine vs. The Union of India, 2018** judgment recognized the importance of individual autonomy and the right to privacy.
3) Dust suppressants are typically **composed of calcium or magnesium salts**, which are mixed with water and then sprayed on roads. This mixture effectively suppresses dust, providing longer-lasting relief from particulate matter in the air.

27th October

1) **Tamil Nadu has the highest number of medical college seats** (11,225), followed by **Karnataka** (11,020), and **Maharashtra** (10,295). Meanwhile, there is an acute shortage of medical college seats about population in Meghalaya, Bihar, and Jharkhand, where the deficit is more than 75%.
2) Between October 2019 and September 2023, **India, Mexico, and China** experienced significant refusals of food export shipments to America. India's refusal rate, which measures the percentage of shipments refused out of all food export shipments, was 0.15%.
3) Over a year after Parliament passed the **Criminal Procedure Identification Act (CrPI), 2022**, the Centre is preparing to introduce **'DNA and Face Matching' systems in 1,300 police stations nationwide**, despite the Act's provisions not yet being fully implemented.

28th October

1) India has initiated a $10 billion plan to bolster local chip production, with companies like Micron Technology setting up assembly and packaging facilities in Gujarat
2) To date, 53 projects have been completed under PMKSY-AIBP, generating an additional irrigation potential of 25.14 lakh hectares
3) The case of Annamalai University in Tamil Nadu is an example of research misconduct, where at least 200 academic papers published by researchers contain plagiarized text, manipulated images, and fudged data in which the university's vice-chancellor was also an author

30th October

1) The 2019 livestock census showed a **70% increase in purebred Gir cows since 2013**. In contrast, other indigenous breeds like **Sahiwal and Hariana** have not experienced similar growth, with some even witnessing a decline in numbers. This trend raises concerns about the loss of diversity in indigenous cattle breeds in India.
2) The 5T initiative in Odisha is a governance model that stands for **Teamwork, Transparency, Technology, Time, and Transformation**, launched with the aim of improving governance and ensuring efficient delivery of public services.
3) **China, South Korea, and Japan** are the **only Asian countries to have hosted the Olympics**, with Japan having hosted the games in both 1964 and 2020.

31st October

1) Static Cloud Seeding involves introducing ice nuclei, such as silver iodide or dry ice, into cold clouds that have super-cooled liquid water droplets. D**ynamic cloud seeding is a method of inducing rain by boosting vertical air currents**. Hygroscopic Cloud Seeding involves spraying fine particles of hygroscopic materials, such as salts through flares or explosives into the base of warm clouds.
2) The GLOF that occurred in Sikkim washed away the **1200-MW Teesta-III** and caused severe damage to NHPC projects downstream, including the 510 MW Teesta-V and the under-construction 500 MW Teesta-VI.
3) **Octane Number measures the fuel's resistance to engine knocking.** Higher octane numbers signify better resistance to premature combustion in gasoline. The **Cetane Number indicates the ignition quality of diesel fuel**. A higher Cetane number signifies easier ignition.

Practice MCQs on Current Affairs – October 2023

1. **Consider the following statements regarding the 'Sankalp Saptaah' initiative:**
1. It is designed to facilitate the implementation of the Tribal Area Development Programme (TADP).
2. This program includes panchayat and block-level people's representatives and functionaries from across the country at Adivaraha Mandapam.
3. The themes for the first six days include "Sampoorna Swasthya," "Suposhit Parivar," "Swachhta," "Krishi," "Shiksha," and "Samridhi Diwas."

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: Sankalp Saptaah is closely linked to the effective implementation of the **Aspirational Blocks Programme (ABP).**
The Aspirational Blocks Program (Launched in 2023) takes its cues from the **Aspirational District Programme initiated in 2018, encompassing 112 districts across India**. The central objective of the ABP is to elevate governance standards and improve the overall quality of life in 500 Aspirational Blocks, spanning 329 districts throughout the country.
Tribal area development programs include-

Centrally sponsored programmes	Programmes in the state sector
➢ Post-matric scholarships; ➢ Girls' hostels; ➢ Pre-examination training; ➢ Tribal development blocks; ➢ Co-operative societies; ➢ Research, training and special projects; ➢ Improvement of working and living conditions of those engaged in unhygienic occupations; ➢ Coaching-cum-guidance centres; and ➢ Grants for all-India non-official organisations doing welfare work among the scheduled tribes and scheduled castes.	➢ Pre-Matric scholarship and stipends; ➢ Exemption from tuition and examinations fee; ➢ Provision of educational equipments; ➢ Provision of mid-day meal; ➢ Setting up of Ashram schools; ➢ Grants for the construction and maintenance of hostel and school buildings; ➢ Provision of land and irrigation; ➢ Supply of bullocks, agricultural implements, seeds, and fertilisers; ➢ Development of cottage industries; ➢ Development of communications; ➢ Co-operative societies; ➢ Colonisation of shifting cultivation; ➢ Supply of poultry, sheep, pigs, goats, etc; ➢ Medical facilities; ➢ Drinking water supply schemes; ➢ Provision of house sites and houses; ➢ Legal aid; and ➢ Grants-in-aid to non-official organisations working at state level.

Hence statement 1 is incorrect.
The inaugural program includes approximately 3,000 panchayat and block-level people's representatives and functionaries from across the country at Bharat Mandapam.
Bharat Mandapam is a massive International Exhibition-cum-Convention Centre in New Delhi, India, managed by ITPO. It hosted the **2023 G20 New Delhi summit, the first G20 summit held in India, from September 9 to 10, 2023**.
Adi Varaha Mandapam, part of the Mahabalipuram rock-cut cave temples, is located near **the Shore Temple and Rathas in the hilltop town of Mamallapuram**. It represents late seventh-century Indian rock-cut architecture and stands as an excellent specimen of ancient Hindu cave architecture. **Hence statement 2 is incorrect.**
Sankalp Saptah will be observed in all 500 aspirational blocks. Each day of Sankalp Saptah focuses on a specific development theme. The **themes for the first six days include "Sampoorna Swasthya," "Suposhit Parivar," "Swachhta," "Krishi," "Shiksha," and "Samridhi Diwas." Hence statement 3 is correct.**

2. **Consider the following statements about the Protection of Children from Sexual Offences Act (POCSO Act):**
1. It is designed to protect children under 18 from sexual assault, harassment, and pornography.
2. It introduced the death penalty for aggravated penetrative sexual assault of a child under the POCSO (Amendment) Act 2022.
3. The law panel advised keeping the age of consent at 18 in the Protection of Children from Sexual Offences Act (POCSO Act) but suggested a more lenient approach for cases involving adolescents aged 16 to 18.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The Protection of Children from Sexual Offences Act (POCSO Act) is a **pivotal legal framework in India dedicated to combatting child sexual abuse.** Enacted in 2012, this Act falls under the jurisdiction of the Ministry of Women and Child Development (MoWCD). **Its primary purpose is to safeguard individuals under the age of 18 from various forms of sexual offences, including assault, harassment, and pornography**. **Hence statement 1 is correct.**
The Act was further reviewed and amended in 2019 to Introduce more stringent punishment including the death penalty for Committing sexual crimes on children, with a view to deter the perpetrators & prevent such crimes against children. **Hence statement 2 is incorrect.**

Recently, the Law panel, headed by **Justice (Retired) Ritu Raj Awasthi**, advised keeping the age of consent at 18 in the Protection of Children from Sexual

Offences Act (POCSO Act) but suggested a more lenient approach for cases involving adolescents aged 16 to 18. **Hence statement 3 is correct.**

3. **Consider the following statements regarding MNREGA:**
1. Gram Sabha Selects the Social Audit Committee under MNREGA.
2. It is based on an Act (MGNREGA) passed in 2005, which makes a legislative commitment to provide the right to work.
3. 100 days for every household in the village whose adult members are ready to work.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The 73rd Amendment of the Constitution empowered the Gram Sabhas to conduct social audits in MNREGA in addition to other functions. **Gram Sabha also selects the Social Audit Committee under MNREGA**. **Hence statement 1 is correct.**
The MGNREG is the **world's largest public employment program**, administered by India's Ministry of Rural Development and established under the MGNREGA Act of 2005, legally ensuring the right to work. **Hence statement 2 is correct.**
To enhance the livelihood security of people by guaranteeing **100 days of wage-employment in a financial year to a rural household whose adult members volunteer to do unskilled work**. **Hence statement 3 is correct.**

4. **Which of the following scientific terms refers to crops that yield significantly more per hectare than traditional variants and were a central focus of the Green Revolution?**
(a) Low-Yielding Varieties (LYVs)
(b) High-Yielding Varieties (HYVs)
(c) Genetically Modified Organisms (GMOs)
(d) Traditional Crop Varieties (TCVs)

Answer: (B)
Explanation: High-yielding varieties (HYVs) of crops are those that **yield significantly more per hectare than traditional variants**. These varieties, often **disease-resistant** and possessing increased tolerance to conditions such as drought, were a central focus of the Green Revolution**. Dr. M.S. Swaminathan played a crucial role in introducing and promoting HYVs in India,** contributing significantly to the country's agricultural productivity and food security.

5. **Consider the following statements regarding the Green Revolution:**
1. Dr. Norman Borlaug is known as the 'Father of the Green Revolution' in India.
2. The word “Green Revolution” was coined by William S. Gaud of the United States Agency for International Development (USAID) in 1968.
3. India adopted IR8 a semi-dwarf rice variety developed by the International Rice Research Institute (IRRI) that could produce more grains of rice per plant.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) three
(d) None

Answer: (B)
Explanation: The **Green Revolution came to India in 1961 during a critical period when the nation faced the threat of famine**. Driven by the efforts of Norman Borlaug, who was invited to India by Dr. M. S. Swaminathan, an advisor to the Indian Minister of Agriculture, this transformative initiative earned **Dr. Swaminathan the title of the "Father of the Green Revolution in India."** Guided by **Prime Minister Lal Bahadur Shastri, the Green Revolution took full form in 1968, notably boosting food grain production in states like Punjab, Haryana, and Uttar Pradesh**. **Hence statement 1 is incorrect.**
The word “Green Revolution” was coined by **William S. Gaud of the United States Agency for International Development (USAID) in 1968**. **Hence statement 2 is correct.**
India began its own Green Revolution program of plant breeding, irrigation development, and financing of agrochemicals. **India soon adopted IR8 a semi-dwarf rice variety developed by the International Rice Research Institute** (IRRI) that could produce more grains of rice per plant when grown with certain fertilizers and irrigation. **Hence statement 3 is correct.**

6. **Consider the following statements, concerning ‘Hallmarking’:**
1. It is the accurate and official recording of the proportionate content of precious metals in precious metal articles.
2. Presently gold and diamond are the two precious metals that have been brought under the purview of Hallmarking.
3. Gold hallmarking is mandatory across India.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)

Explanation:

· Hallmarking is the accurate determination and official recording of the proportionate content of precious metal in precious metal articles. **Hallmarks are official marks used in many countries as a guarantee of purity or fineness of precious metal articles.** The principal objectives of the Hallmarking Scheme are to protect the public against adulteration and to obligate manufacturers to maintain legal standards of fineness. **Hence, statement 1 is correct.**

· **In India, at present 2 precious metals namely gold and silver have been brought under the purview of Hallmarking. Hence, statement 2 is incorrect.**

· **The Bureau of Indian Standards (BIS) has implemented mandatory hallmarking of gold jewellery and artefacts in 256 districts from June 2021.** After the 3rd phase, a total of 343 districts is expected to be covered across the country for the hallmarking of the gold. **The hallmarking centres have been set up in the newly notified 55 districts under the scheme for successful implementation**. The authenticity and purity of the hallmarked gold jewellery items with the Hallmark Unique Identification (HUID) number purchased can be verified by 'verify HUID' in the BIS Care app. **Hence, statement 3 is incorrect.**

7. **Which of the following statement best define the Baryonic Acoustic Oscillations (BAO) process?**

(a) They are a pattern of wrinkles in the clusters of galaxies spread across the Universe.

(b) They are the most powerful accelerator in the world, which boosts particles, such as protons.

(c) It is an area in space that nothing, not even light, can escape from, due to the force that pulls objects in space towards each other being so strong there.

(d) It is a hypothetical celestial object, which expands outwards from a space–time singularity and emits energy.

Answer: **(A)**

Explanation: The BAO is a phenomenon that occurred in the early times of the universe, before the decoupling of matter and radiation, where the perturbation of baryonic matter propagated as a wave. **Baryon acoustic oscillations (BAO) are a pattern of wrinkles in the density distribution of the clusters of galaxies spread across the Universe**. The baryon acoustic oscillations are imprinted on matter in the early Universe**. When the Universe was in its infancy, matter was spread out in an almost uniform sea of particles, and gravity was trying to alter this by pulling large pockets of matter together to form galaxies.** This was not an easy process because the matter heated up as gravity pulled it together. **This created an outward pressure that pushed the matter apart again**. As it expanded, however, it cooled and gravity started to pull it back together again. This interplay of gravity and pressure set up an oscillation that created the equivalent of sound waves. These spread outward in bubbles, carrying along some matter with them. **Hence, option (a) is correct.**

8. **Consider the following statements regarding gravity batteries:**

1. Gravity batteries store gravitational energy, which is the energy resulting from a change in height due to gravity, also known as potential energy.

2. These batteries work by using excess energy to raise a mass, generating gravitational potential energy, which is then converted into electricity through an electric generator.

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: Gravity batteries store gravitational energy, which is the potential energy associated with the height of an object due to gravity. This **potential energy can be converted into electricity**. Gravity batteries operate by raising a mass, which generates gravitational potential energy. This potential energy can be harnessed and converted into electricity through an electric generator. **Hence, both statements are correct.**

9. **Consider the following statements regarding the 2023 Nobel Prize in Medicine or Physiology:**

1. It was awarded to Dr Svante Pääbo for his discoveries concerning the genomes of extinct hominins and human evolution.

2. The 2023 Nobel Prize in Medicine was awarded for research that has direct implications in the treatment of emerging zoonotic diseases like COVID-19.

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: **2023 Nobel Prize in Medicine or Physiology: Dr. Karikó and Dr. Weissman were awarded the Nobel Prize for their "discoveries concerning nucleoside base modifications that enabled the development of effective mRNA vaccines against COVID-19".** mRNA stands for messenger RNA,

a type of molecule that carries instructions from the DNA to a cell's cytoplasm, where those messages are 'read' to produce various proteins. **Hence, statement 1 is incorrect.**

10. **15th BRICS summit held in Johannesburg, in 2023, led to the expansion of BRICS, making it BRICS-Plus. 6 new countries have been added to the grouping. Which of the following countries is NOT one of these new members?**
(a) Argentina
(b) Chile
(c) Egypt
(d) Iran

Answer: (B)
Explanation: The 15th BRICS summit held in J**ohannesburg, in 2023, led to the expansion of BRICS, making it BRICS-Plus**. 6 new countries have been added to the grouping, i.e., Argentina, Egypt, Ethiopia, Saudi Arabia, Iran and UAE. **Hence, option (b) is correct.**

11. **Consider the following statements:**
1. TRAFFIC is an organization established by WWF and IUCN to administer wildlife trade.
2. Odisha is the highest-ranked node in the tortoise and hard-shell turtle trafficking network.

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: TRAFFIC is an organization that was **established in 1976 by WWF and IUCN**. It is a wildlife trade monitoring network to undertake data collection, analysis, and provision of recommendations to inform decision-making on wildlife trade. **TRAFFIC became an independent non-profit organization in 2017, with WWF and IUCN sitting on its Board of Directors along with independent Board members**. Chennai is the highest-ranked node in the tortoise and hard-shell turtle trafficking network fuelling the global pet trade. **The most frequent trafficking links in the soft-shell turtle trafficking network were from Jaunpur in Uttar Pradesh to unspecified districts in West Bengal and from North 24 Parganas** to unspecified districts in Bangladesh. Asian turtle crisis is a term often used to describe the current state of tortoises and freshwater turtles (TFTs) in the largest Continent on earth. **Hence, statement 2 is incorrect.**

12. **Consider the following statements:**
1. The Moscow format is one of the several dialogue platforms in Afghanistan before the Taliban takeover of Kabul.
2. Both China and India are part of the Moscow Format.
3. The Kazan Declaration deals with the well-being of the Afghan People.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The **Moscow format is one of the several dialogue platforms in Afghanistan, which began before the Taliban takeover of Kabul.** It consists of Russia, China, Pakistan, Iran, Kazakhstan, Tajikistan, Kyrgyzstan, Uzbekistan, Turkmenistan and India. **As part of its initiatives to encourage a peaceful conclusion to the violence and instability in Afghanistan, the Russian government initially started it in 2017.**
The key objective of the Moscow format of consultations is to facilitate the national reconciliation process in Afghanistan to establish peace. **The Kazan Declaration is a document that resulted from the fifth regional consultation on Afghanistan, known as the Moscow Format, which took place in Kazan, Russia.** The Kazan Declaration underscores the call for the Afghan authorities to create conditions that improve the well-being of the Afghan people, deter further migration, and facilitate the return of refugees. **Hence, all statements are correct.**

13. **Consider the following statements, concerning Project Udbhav:**
1. The project aims to bridge the gap between historical and contemporary knowledge only in ship building industry.
2. It is an initiative of the Ministry of Ports, Shipping and Waterways.

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 Indian Army has started an initiative, named Project Udbhav. **The project aims to rediscover the profound Indic heritage of statecraft and strategic thoughts derived from ancient Indian texts of statecraft, Warcraft, diplomacy and grand strategy**. The project is carried out in collaboration with the United Service Institution (USI) of India. Beyond

rediscovery, the **project aims to develop an indigenous strategic vocabulary deeply rooted in India's philosophical and cultural heritage**. The project aims to bridge the gap between historical and contemporary knowledge. **Hence, both statements are incorrect.**

14. **In economics, which of the following explains Gresham's law?**
(a) It is a monetary principle stating that "good money drives out bad".
(b) The relationship between rising household incomes and total food spending.
(c) It is a monetary principle stating that "bad money drives out good".
(d) The bulk of public programs are designed primarily to benefit the lower and middle classes but are financed by taxes paid primarily by the upper class.

Answer: **(C)**
Explanation: Gresham's Law, named after Thomas Gresham, states that "**bad money drives out good" when the government fixes the exchange rate between two currencies at a level different from the market rate.** This leads to the undervalued currency going out of circulation, while the overvalued currency remains but lacks buyers. The law can result in a currency shortage when demand exceeds supply due to the fixed price. **Gresham's law applies not only to paper currencies but also to commodities.** It can cause goods to disappear from the formal market when their prices are forcibly undervalued by governments. Thiers' law, on the other hand, states that "good money drives out bad" when people have the freedom to choose between currencies, and they prefer higher-quality currencies. **Hence, option (c) is correct.**

15. **Consider the following statements regarding ammonia:**
1. It forms a covalent bond with hydrogen atoms.
2. Ammonia can act as a Lewis base in chemical reactions.
3. Its boiling point is higher than that of methane.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: **(C)**
Explanation: Ammonia (NH_3) forms covalent bonds with three hydrogen atoms, sharing electrons. Ammonia can indeed act as a Lewis base, as it can donate a lone pair of electrons to form a coordinate covalent bond with a Lewis acid. T**he boiling point of ammonia (-33.34 degrees Celsius) is higher than that of methane (-161.5 degrees Celsius). Ammonia gas is colourless, but it has a pungent, characteristic odour**. **Hence, all statements are correct.**

16. **Consider the following statements, with reference to the Attosecond Pulses:**
1. Attosecond is a brief unit of time that helps capture fundamental forces such as electrons.
2. An attosecond is one-billionth of a nanosecond.
3. The pulses of light cannot be captured at Attosecond.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Recently 3 scientists received Nobel Prize award, 2023 in the field of Physics for their "experimental methods that generate attosecond pulses for the study of electrons dynamics in matter." The laureates were awarded the Prize for experiments that have allowed scientists to produce ultra-short pulses of light, with which they can finally 'see' directly into the super-fast world of electrons. **Attosecond physics gives us the opportunity to understand mechanisms that are governed by electrons.** The movement of an atom in a molecule can be studied with the very shortest pulses produced by a laser. These movements and changes in the atoms occur on the order of a femtosecond that is a millionth of a billionth of a second. However, electrons are lighter and interact faster, in the attosecond realm. **An attosecond is one-billionth of a nanosecond.** By fine-tuning the setup used to produce the overtones, scientists realised that it should be possible to create intense pulses of light each a few attoseconds long. Attosecond pulses allow scientists to capture 'images' of activities that happen in incredibly short time spans. **Hence, statement 3 is incorrect.**

17. **Consider the following statements, with reference to UMMEED:**
1. It is a set of guidelines released by the Union Ministry of Health and Family Welfare.
2. The initiative aims to prevent suicide among both school and college students.

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: A set of guidelines was recently released by the Union Ministry of Education (MoE) to prevent suicide among students. **UMMEED stands for – Understand, Motivate, Manage, Empathise, Empower, Develop.** The guidelines aim to serve as directions to schools for enhancing sensitivity, understanding and providing support in case of reported self-harm. **The Union Ministry of Education released the draft guidelines for schools to prevent suicide among students, prescribing in its plan of action**. A school wellness team (SWT) may be formed under the leadership of the school principal, where each member is oriented in handling crisis situations. **The guidelines recommend an orientation a year for teachers and family members**, to help build awareness around student suicides. These orientations will be conducted by the schools for the capacity-building of various stakeholders. **Hence, both statements are incorrect.**

18. **Which of the following statements about Basohli Pashmina is/are correct?**

1. It is a hand-spun product known for extreme softness.
2. It is obtained from mountain goats found on the Changthang Plateau in Tibet and parts of Ladakh.
3. It is a more than 100-year-old traditional craft from Jammu and Kashmir's Kathua district.

Which of the above statements are correct?

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

Answer: (D)

Explanation: It is a hand-spun product known for extreme softness, fineness and light-weight, has insulating properties and extended life. It is obtained from a breed of mountain goats (Capra hircus) found on the Changthang Plateau in Tibet and parts of Ladakh. Recently, **Basohli Pashmina, a more than 100-year-old traditional craft from Jammu and Kashmir's Kathua district, has got the Geographical Indication (GI) tag. Hence, all statements are correct.**

19. **What is the Palermo Convention primarily focused on?**

(a) Environmental protection in Antarctica
(b) Combating transnational organized crime
(c) Conservation of migratory species
(d) Maritime boundary disputes in the South China Sea

Answer: (B)

Explanation: The Palermo Convention, also known as the U**nited Nations Convention against Transnational Organized Crime,** is primarily focused on combating transnational organized crime. I**t is a landmark international treaty adopted by the United Nations in 2000**. The convention aims to promote international cooperation in the prevention and control of various forms of organized crime, including **human trafficking, drug trafficking, money laundering, and more.** It establishes a framework for countries to work together in addressing these global criminal challenges. **Hence, option (b) is correct.**

20. **Consider the following statements regarding Quantum Dots:**

1. The 2023 Nobel Prize in chemistry was awarded to Moungi G. Bawendi, Louis E. Brus and Alexei I. Ekimov for the discovery and synthesis of quantum dots.
2. Quantum dots are semiconductor particles a few nanometres in size, having optical and electronic properties that differ from those of larger particles as a result of quantum mechanical effects.

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 **2023 Nobel Prize in chemistry was awarded to Moungi G. Bawendi, Louis E. Brus and Alexei I. Ekimov for the discovery and synthesis of quantum dots**. These nanoparticles have wide-ranging applications across fields like electronics, advanced surgery, and quantum computing. **Quantum dots (QDs), also called semiconductor nanocrystals, are semiconductor particles a few nanometres in size, having optical and electronic properties that differ from those of larger particles as a result of quantum mechanical effects**. When the quantum dots are illuminated by UV light, an electron in the quantum dot can be excited to a state of higher energy. In the case of a semiconducting quantum dot, this process corresponds to the transition of an electron from the valence band to the conductance band. The excited electron can drop back into the valence band releasing its energy as light. This light emission is called photoluminescence. **Hence, both statements are correct.**

21. **Consider the following statements, concerning Swavlamban 2.0:**

1. It aims to improve indigenisation & self-reliance in defence.
2. It is a joint initiative of the Ministry of Defence & the Ministry of Home Affairs.
3. SPRINT's innovative challenge is associated with Swavlamban.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: In the recently concluded **Swavlamban 2.0**, several announcements were made by Raksha Mantri Shri Rajnath Singh to promote 'Aatmanirbharta' in defence and innovation. It is a **two-day seminar of the Naval Innovation and Indigenisation Organisation (NIIO). Defence Minister Rajnath Singh at the event released the fifth Positive Indigenisation List (PIL) of 98 items.** The items will be procured by the three armed services from indigenous suppliers in a staggered manner as per specified timelines. Highly complex systems, sensors, weapons and ammunition have been included in the list. All these items will be procured from indigenous sources as per provisions given in Defence Acquisition Procedure (DAP) 2020 in a staggered timeline. **He also released the Indian Navy's updated Indigenisation Roadmap 'Swavlamban 2.0'. It was launched under the 10th Defence India Start-up Challenges (DISC 10) & DISC 10 PRIME of Innovations for Defence Excellence (iDEX) and 5 problem statements under iDEX for Fauji.** SPRINT's innovative challenge was launched by Prime Minister Shri Narendra Modi during the Swavlamban seminar in 2022. It **promotes the use of indigenous technology and products in the Navy** and has helped in taking the country forward in becoming self-reliant in the defence sector. **Hence, statement 2 is incorrect.**

22. **The objectives of the National Cancer Registry Programme include which of the following?**
1. To obtain an overview of patterns of cancer in different parts of the country.
2. To calculate estimates of cancer incidence wherever feasible.
3. To get to know the similarities and differences in patterns of cancer across the country.
4. To provide preventive, diagnostic, treatment and palliative services for Cancer.

Select the correct answer using the code given below:
(a) 1, 2 and 3
(b) 2, 3 and 4
(c) 3, 4 and 1
(d) 4, 1 and 2

Answer: (A)
Explanation: The main objectives of the programme are:
1. To obtain an overview of patterns of cancer in different parts of the country.
2. To calculate estimates of cancer incidence wherever feasible.
3. The overall aim of the study is to get to know the similarities and differences in patterns of cancer across the country in a relatively cost-effective way.

Since 1982, the National Cancer Registry Programme (NCPR) has sourced records via 2 mediums which are:
· Population-based cancer registries (PBCRs)
· Hospital-based cancer registries (HBCRs).
PBCRs trace incidence and trends for a defined geographical population in a region, while hospital-based registries focus on the medical symptoms, diagnosis and care of cancer cases. **NCPR keeps records of 38 PBCRs and 189 HBCRs distributed through India. These registries are regulated under the National Centre for Disease Informatics and Research (NCDIR) of the Indian Council of Medical Research (ICMR)**. Since cancer is not a notifiable disease in India, data collection is active in nature.
Hence, option (a) is correct.

23. **Consider the following statements, with reference to the Quantum Dots:**
1. Quantum dots are particles that are a few nanometres wide.
2. Quantum dots are known for their high fluorescence quantum yields.
3. The properties of quantum dots can be changed by changing their size.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: Recently the Chemistry Nobel Prize 2023 was awarded to the scientists for their discovery and synthesis of quantum dots. **Quantum dots are particles that are a few nanometres wide**. They exhibit unique optical properties due to their small physical size. **Their structure and atomic composition are the same as bulk materials**, but the properties of the bulk materials don't depend on their size. The properties of quantum dots can be changed by changing their size. At the scale of nanometres, materials and particles are capable of new, size-dependent properties because quantum physical forces start to dominate. **Quantum dots are known for their high fluorescence quantum yields,**

making them efficient fluorophores in biological imaging and labelling. They offer photostability and reduced photobleaching. **Quantum dots are used in photovoltaic cells to improve the absorption and efficiency of converting solar light into electricity.** Certain cancer treatments use quantum dots for targeted drug delivery and other therapeutic measures. Quantum dots can be used as security markers on currency and documents as an anti-counterfeit measure. They can be used as fluorescent markers to tag and track objects. **Hence, all statements are correct.**

24. **Consider the following statements regarding Lhonak Lake:**
1. Lhonak Lake is a glacial-moraine-dammed lake.
2. It plays a role in the hydrological cycle benefiting the Teesta River basin.

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: South Lhonak Lake is a **glacial-moraine-dammed lake, located in Sikkim's far northwestern region**. It is one of the fastest expanding lakes in the Sikkim Himalaya region and o**ne of the 14 potentially dangerous lakes susceptible to Glacial lake outburst floods (GLOFs)**. It plays a role in the hydrological cycle, releasing water downstream, ultimately benefiting the Teesta River basin. **Hence, both statements are correct.**

25. **Recently, India signed the RuPay Domestic Card Scheme Agreement with which country?**
(a) United Arab Emirates
(b) Singapore
(c) Switzerland
(d) Brazil

Answer: **(A)**
Explanation: Recently, the RuPay Domestic Card Scheme Agreement between India and the UAE. **The DCS will aim to facilitate the growth of e-commerce and digital transactions in the UAE, bolster financial inclusion, support the UAE's digitization agenda, increase alternate payment options, reduce the cost of payments, and enhance the UAE's competitiveness and position as a global payments leader**. The partnership aligns perfectly with NIPL's mission to offer its knowledge and expertise to assist other countries in establishing their own cost-efficient, and secure payment systems.

26. **Consider the following statements, with reference to 'A to Zero ASEAN Summit':**
1. The summit is associated with Net Zero Targets of the ASEAN countries.
2. This year the summit was hosted by India.
3. The Ministry of New and Renewable Energy is in charge of achieving Net Zero Targets in India.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: The **A to Zero ASEAN Summit was recently held in Malaysia to Accelerate Net Zero Pathways across Asia.** A to Zero, or Accelerate to Net Zero, is a new series of events. The events bring together key decision-makers and change-makers to comprehensively explore pathways, policies and business opportunities that will catalyze an acceleration of net zero pathways. **The summit was held in Kuala Lumpur, Malaysia. Indian Renewable Energy Development Agency (IREDA) was a representative from India that participated in the summit**. The Ministry of Environment Forest and Climate Change is responsible for achieving net zero targets in India. **Hence, statement 1 is correct.**

27. **Consider the following statements, with reference to the Veer Gatha Project:**
1. It aims to inspire school children to make them aware of the stories about the National Heroes.
2. It was launched by the Ministry of Defence in coordination with the Ministry of Education.
3. The Project will be implemented only in the schools in Tier II cities in India.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Recently over 1.36 crore school students from across the country participated in Veer Gatha Project 3.0 which aims to disseminate the acts of bravery of the Gallantry Awardees to school students**. It aims to inspire school children to make them aware of the stories about National Heroes and brave hearts to disseminate their acts of bravery and life stories.** The Students are encouraged to take part in a variety of activities such as the framing of poems, paragraphs, and essays, and the painting competition. **Project Veer Gatha was instituted under the Gallantry Awards**

Portal (GAP) in 2021. Veer Gatha Project 3.0 was launched by the Ministry of Defence in coordination with the Ministry of Education. The project will be open to all schools in all States and Union Territories. **The best project will be rewarded nationally by the Ministry of Defence on the forthcoming Republic Day. Hence, statement 3 is incorrect.**

28. **Consider the following statements, with reference to Sammakka-Sarakka Jatara:**
1. It is an annual tribal festival celebrated in Medaram, Telangana.
2. It is often referred to as the "Kumbh Mela of the tribals".
3. The festival commemorates the resistance against taxation and oppression by Sammakka and Sarakka.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:
· The Sammakka-Sarakka Jatara is a **biennial tribal festival celebrated in Medaram, Telangana**. It is one of the largest gatherings of tribal people globally. **Hence, statement 1 is incorrect.**
· It is **often referred to as the "Kumbh Mela of the tribals"** and has gained recognition for its cultural and spiritual significance. **Hence, statement 2 is correct.**
· The festival commemorates the courage and resistance of Sammakka and Sarakka and their fight against taxation and oppression. **Hence, statement 3 is correct.**

29. **Consider the following statements, with reference to the Nobel Prize for Literature 2023:**
1. Jon Fosse was awarded the Nobel Prize for Literature in 2023 for his innovative plays and prose that give voice to the unsayable.
2. Fosse is known for his exploration of themes related to the human condition, the absurdity and futility of life, and the power of human emotions.

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: Jon Fosse, a Norwegian author, was awarded the Nobel Prize for Literature in 2023 for his innovative plays and prose that give voice to the unsayable. **Fosse is known for his exploration of themes related to the human condition, the absurdity and futility of life, and the power of human emotions.** His writing style is characterized by its simplicity, minimalism, and searing dialogue, which is reminiscent of renowned playwrights like Samuel Beckett and Harold Pinter. **Hence, both statements are correct.**

30. **Which of the following best describes the 'Wagh Nakh'?**
(a) A type of Indian sword used by warriors during battles.
(b) A medieval claw-like dagger with curved blades used for personal defence.
(c) A traditional Indian musical instrument made from tiger claws.
(d) A type of martial art practised in ancient India.

Answer: (C)
Explanation: The 'wagh nakh,' meaning 'tiger claws,' is a medieval claw-like dagger used across the Indian subcontinent. It **consists of four or five curved blades attached to a glove or bar and is known for its slicing capabilities**. The legendary use of the 'wagh nakh' is associated with the story of **Afzal Khan**, a formidable general of **Bijapur's Adil Shahi Sultanate**, who was ordered to subdue **Chhatrapati Shivaji Maharaj**. **Hence, option (c) is correct.**

31. **Consider the following statements, with reference to the 'Freedom on the Net 2023' Report:**
1. The report is released by Freedom House, a specialised agency of the United Nations.
2. It evaluates Internet freedom across the world.
3. According to the report India has more internet freedom than China and Pakistan.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: **(A)**
Explanation:
· The report is released by the **Freedom House, a Washington DC-based non-profit organisation. The report is titled 'Freedom on the Net 2023:** The Repressive Power of Artificial Intelligence'. **Hence, statement 1 is not correct.**
· The report, the 13th edition of an annual study of human rights online, covers developments between June 2022 and May 2023. **It evaluates Internet freedom in 70 countries, accounting for 88% of the world's Internet users**. **Hence, statement 2 is not correct.**
· It has **raised a red flag on the increasing use of artificial intelligence by governments for censorship**

and the spread of disinformation. Elections were a trigger for digital repression. As per the report, the sharpest rise in digital repression was witnessed in Iran. It is where the authorities shut down Internet service, blocked WhatsApp and Instagram, and increased surveillance in a bid to quell anti-government protests. **On a range of 1 to 100 where '100' represented the highest digital freedom and '1' the worst repression, India scored 50. Iceland, with a score of 94, emerged as the country with the best country for Internet freedom**. China, for the 9th straight year, ranked as the world's worst environment for Internet freedom, with Myanmar the world's 2nd most repressive for online freedom. Pakistan has a score of 26 which is below India. **Hence, statement 3 is correct.**

32. **'Dakar Declaration', recently seen in the news is related to which of the following?**
(a) Standardize transactions involving movable property.
(b) To protect human beings and the environment against industrial accidents.
(c) Reduction of global emissions reductions and increased climate finance.
(d) Convention on the International Effects of Judicial Sales of Ships to promote legal certainty.

Answer: (C)
Explanation: Recently Ministers from the world's 46 least developed countries (LDC) issued a joint Dakar Declaration on Climate Change 2023 outlining their expectations and priorities for the 28th Conference of Parties (COP28). **The Dakar Declaration called for urgent global emissions reductions, increased climate finance, and a strong outcome operationalising the new Loss and Damage Fund.** Declaration has an ambitious Global Stocktake to close the gaps in global climate action. **While least-developed countries (LDCs) account for more than 14 % of the global population, they only account for about 1 % of emissions from fossil fuels and industrial processes.** The UNFCCC centralised carbon market mechanism must also be operationalised by 2024, including the recognition of the specific needs and special circumstances of LDCs. **Hence, option (c) is correct.**

33. **Nagorno-Karabakh is a conflicted region between which of the following two countries?**
(a) Russia and Ukraine
(b) Armenia and Azerbaijan
(c) Israel and Palestine
(d) China and Taiwan

Answer: (B)
Explanation: The conflict between Armenia and Azerbaijan over Nagorno-Karabakh is called one of the "frozen conflicts" of the world. **Nagorno-Karabakh is a mountainous region officially recognised as part of Azerbaijan**. However, its 1.2 lakh population is predominantly ethnic Armenian, having close cultural, social, and historical ties with Armenia. It is an ethnic Armenian enclave in Azerbaijan. **Nagorno-Karabakh also known as Artsakh by Armenians, is a landlocked mountainous area in the South Caucasus. Hence, option (b) is correct.**

34. **Consider the following statements in reference to the Nobel Prize for Peace 2023:**
1. Narges Mohammadi, an Iranian activist, was awarded the Nobel Prize for Peace in 2023.
2. She also received the 2023 PEN/Barbey Freedom to Write Award and the 2023 UNESCO/Guillermo Cano World Press Freedom Prize.

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: Narges Mohammadi, an Iranian activist, was awarded the Nobel Prize for Peace in 2023. **The Nobel Committee recognized her dedication to fighting against the oppression of women in Iran and her relentless advocacy for human rights and freedom**. Narges Mohammadi received prominent awards in the West for her activism, including the 2023 PEN/Barbey Freedom to Write Award and the 2023 UNESCO/Guillermo Cano World Press Freedom Prize. **In 2022, she was featured in the BBC's list of 100 inspiring and influential women from around the world**. **Hence, both statements are correct.**

35. **In the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below:**
Assertion (A): An increase in the repo rate by a central bank can lead to a decrease in inflation.
Reason (R): A higher repo rate reduces the money supply in the economy, which can lower aggregate demand and, in turn, put downward pressure on prices.
(a) A is correct but R is incorrect.
(b) Both A and R are correct and R is the correct explanation of A.
(c) A is incorrect but R is correct.
(d) Both A and R are correct but R is not the correct explanation of A.

Answer: (B)
Explanation: Central banks often use the repo rate as a tool to control inflation. **When a central bank increases the repo rate, it becomes more expensive for banks to**

borrow money from the central bank. Consequently, banks may raise their lending rates, making it more expensive for businesses and individuals to borrow. This can reduce borrowing and spending in the economy, leading to decreased aggregate demand and, potentially, lower inflation.

A higher repo rate set by the central bank can indeed reduce the money supply in the economy. When the central bank charges higher interest on funds lent to commercial banks, banks may reduce their borrowing and lending activities. This reduction in lending can decrease the money supply, which, in turn, can lead to reduced aggregate demand. As a result, the upward pressure on prices (inflation) can be mitigated.

In summary, both statements are generally accurate. An increase in the repo rate can indeed lead to a decrease in inflation, and this is primarily due to the central bank's ability to influence borrowing costs and, subsequently, aggregate demand through its monetary policy tools. **Hence, option (b) is correct.**

36. **Consider the following statements with reference to Kaaka Aazhi, sometimes seen in the news recently:**

1. Mytella strigata is a mussel species referred to locally as 'kaka aazhi'.
2. It is an invasive species native to South America.
3. It spreads over the riverbed and prevents prawns from grazing.

How many of the statements given above are correct?

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

Answer: (C)

Explanation: Recently National Green Tribunal has sought a report on the removal of invasive mussel species from the Ennore-Pulicat wetland of Tamil Nadu. '**Mytella strigata' is an invasive South American mussel species. Mytella strigata is referred to locally as 'kaka aazhi'.** It is wiping out the locally prevalent and commercially valuable yellow clams (manja matti) and green mussels (pachai aazhi). It has spread over the riverbed, preventing prawns from grazing or burying themselves in the sediment. **Because of the invasive mussels, the river bottom is suffocated with a foot-deep sludge of black, foul-smelling slimy excreta**. Kaaka Aazhi is not an alien species as it has an entry in the Wildlife Protection Act, 1972 (WPA). '**Unionidae' is the largest family of freshwater mussels that is found mostly in the USA**. The National Green Tribunal do not have jurisdiction over the Wild Life (Protection) Act, 1972. **Hence, all statements are correct.**

37. **Which of the following statements is correct regarding Watermeal (Wolffia spp.)?**

(a) It is the largest flowering plant in the world.
(b) It has roots, stems, and leaves.
(c) Watermeal is known for its rapid growth and high oxygen production.
(d) It is primarily found in the deserts of Africa.

Answer: (C)

Explanation: Watermeal (Wolffia spp.) is **a small aquatic plant known for its extremely rapid growth and its ability to produce a significant amount of oxygen through photosynthesis**. Unlike some other plants, Watermeal is rootless and stemless, and it floats on the surface of water. It is not the largest flowering plant in the world and is not primarily found in deserts. **Hence, option (c) is correct.**

38. **Consider the following pairs:**

Group/Organization	Country of operation
1. Hezbollah	Israel
2. Hamas	Palestine
3. Kurdistan Workers' Party	Turkey

How many of the above pairs are incorrectly matched?

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

Answer: (A)

Explanation:

· Hezbollah is a **Shia militia-cum-political party in Lebanon**. Hezbollah and Israel have fought two wars before. They have been observing a tenuous ceasefire for 14 years. **Hence, pair 1 is incorrectly matched.**

· **Hamas is the largest Palestinian militant Islamist group and one of the two major political parties in the region**. Currently, it governs more than two million Palestinians in the Gaza Strip. **Hence, pair 2 is correctly matched.**

· **The Kurdistan Workers' Party or PKK is a Kurdish militant political organization and armed guerrilla movement that historically operated throughout Kurdistan** but is now primarily based in the mountainous Kurdish-majority regions of southeastern Turkey and northern Iraq. **Hence, pair 3 is correctly matched.**

39. **South Lhonak Glacier, sometimes seen in the news recently, is located in which of the following states?**

(a) Arunachal Pradesh
(b) Sikkim
(c) Himachal Pradesh

(d) Jammu & Kashmir

Answer: (B)
Explanation: The recent flood situation in Sikkim was due to the Glacier Lake Outburst Flood (GLOF) that was triggered by the South Lhonak Glacier**. The South Lhonak glacier is located in the northern part of the Sikkim. It is one of the fastest retreating glaciers.** The glacier receded nearly 2 km in the past 46 years (1962 to 2008**). It further retreated by 400m (approximately) from 2008 to 2019.** There are an **estimated 7,500 glaciers in the Himalayas that have caused the Glacier Lake Outburst Flood (GLOF)** and have been associated with major disasters through the years. Sikkim, comprising 0.5 % of India's landmass, has 84 glaciers, the largest number as compared to any other state or union territory. **Hence, option (b) is correct.**

40. **Consider the following statements regarding Sounding Rockets:**
1. Sounding rockets are designed for orbital spaceflight.
2. Sounding rockets are used for scientific research and atmospheric studies.
3. Sounding rocket flights are relatively long-lived, typically lasting a few years.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation:
· Sounding rockets are not designed to achieve orbit around Earth. Instead, they follow a suborbital trajectory, reaching altitudes that may range from tens to hundreds of miles above the Earth's surface. **Hence, statement 1 is incorrect.**
· **Sounding rockets carry scientific instruments and experiments, known as payloads, into space**. These payloads are carefully designed to collect data on factors such as atmospheric conditions, cosmic rays, radiation, and electromagnetic phenomena. **Hence, statement 2 is correct.**
· **Sounding rocket flights are relatively short-lived, typically lasting a few minutes**. This limited duration allows researchers to gather data during specific phases of a mission, such as during a solar eclipse or in the ionosphere. **Hence, statement 3 is not correct.**

41. **Consider the following statements with reference to the Scheme for Residential Education for Students in High Schools in Targeted Areas (SHRESTHA):**
1. It aims to provide seats for the meritorious Scheduled Castes (SCs) boys and girls in the best private residential schools in the country.
2. The scheme is implemented by the Ministry of Social Justice & Empowerment.
3. The scheme is applicable only for the admission in Class 9 and Class 11.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The objective of SHRESHTA is to enhance the reach of a development intervention of the Government and to fill the gap in service deficient SCs dominant areas, in the sector of education. **The scheme provides grant-in-aid to institutions (run by NGOs) and residential high schools and provides an environment for socio-economic upliftment and overall development of the Scheduled Castes (SCs).** The scheme is implemented by the Ministry of Social Justice & Empowerment. It provides easy access to the meritorious SC students in the best schools in the Country for their Educational and Holistic Development, thereby securing their future opportunities. **For SHRESHTA schools, meritorious SC students will be selected through the National Entrance Test for SHRESHTA (NETS) to be conducted by the National Testing Agency (NTA).** The passed candidates are admitted in the best private residential schools affiliated by the CBSE/State Board in classes 9th and 11th for completion of education till 12th standard. **Best performing CBSE-based private residential schools, having more than 75% pass percentage for classes 10 and 12 for the last 3 years are selected by a Committee for admission of selected students**. The scheme is applicable only for the admission in Class 9 and Class 11. **Hence, all statements are correct.**

42. **Consider the following pairs:**

Exercises	**Countries**
1. SIMBEX	India and Singapore
2. SAMPRITI	India and Bangladesh
3. CHAKRAVAT	India and Egypt

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:

· **SIMBEX:** It is a bilateral naval exercise between **India and Singapore**. The 30th Edition of the Singapore-India Maritime Bilateral Exercise (SIMBEX), 2023 was held in the southern parts of the South China Sea.

· **SAMPRITI:** It is a **joint army exercise between India and Bangladesh**. The 11th edition (SAMPRITI-XI) of the annual joint military exercise was held at Meghalaya, India.

· **CHAKRAVAT** is an **Annual Joint HADR (Humanitarian Assistance and Disaster Relief) Exercise. The exercise involves multi-agency participation.** The 2023 edition would further synergise efforts at the national level among all stakeholders, as well as witness participation from 8 countries of the Indian Ocean Region. **The exercise has been conducted by the Indian Army, Indian Navy (IN) and Indian Air Force (IAF) in rotation since 2016**. The 2023 edition of the exercise is being hosted by the Indian Navy at Goa in the month of October.

Hence, pair 3 is incorrectly matched.

43. **Consider the following statements, with reference to the Nobel Prize for Economics 2023:**
1. Narges Mohammadi was bestowed with the Economics Nobel for 2023 for her work on the gender gap in the labour market.
2. The recipient of the Nobel Prize, in 2023 is the 3rd woman to receive Nobel Prize in Economics.

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: Claudia Goldin, a professor at Harvard recently received the Nobel Prize for Economics 2023 for her work on the gender gap in the labour market. **Claudia Goldin is the 3rd woman to receive a Nobel Prize in the field of economics after Elinor Ostrom in 2009 and Esther Duflo in 2019**. Claudia Goldin received the award for research that has advanced the understanding of the gender gap in the labour market**. Goldin's research does not offer solutions, but it allows policymakers to tackle the entrenched problem**. Her research reveals the causes of change, as well as the main sources of the remaining gender gap. **Hence, statement 1 is incorrect.**

44. **What is the primary purpose of card-on-file tokenization in the context of digital payments?**
(a) To store cardholder data securely for easy access in future transactions.
(b) To convert sensitive card information into a unique token for enhanced security.
(c) To facilitate international money transfers between banks.
(d) To provide discounts and rewards to cardholders.

Answer: (B)
Explanation: Card-on-file tokenization is a **security technique used in digital payments to replace sensitive cardholder data (such as card numbers) with unique tokens**. This process enhances security by reducing the risk of data breaches and fraud when storing and transmitting payment information. The primary purpose of tokenization is to improve the security of digital transactions. **Hence, option (b) is correct.**

45. **Consider the following statements regarding the women's reservation bill or Nari Shakti Vandan Adhiniyam:**
1. It reserves one-third (33%) of the seats in Lok Sabha, State legislative assemblies and the Delhi assembly for women.
2. This will also apply to the seats reserved for SCs (Scheduled Castes) and STs (Scheduled Tribes) in Lok Sabha and State Legislatures.
3. This reservation will be implemented in the upcoming 2024 General Elections.

Which of the above statements 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: The women's reservation bill or **Nari Shakti Vandan Adhiniyam reserves one-third (33%) of the seats in Lok Sabha, State legislative assemblies and the Delhi assembly for women.** This will also apply to the seats reserved for SCs (Scheduled Castes) and STs (Scheduled Tribes) in Lok Sabha and State Legislatures.
However, the reservation will not be effective immediately, but only after the next census. Based on the census, delimitation will be undertaken to reserve seats for women. **The reservation will be provided for a period of 15 years.** However, it shall continue till such date as determined by Parliamentary enactment. **Hence, statement 3 is incorrect.**

46. **Consider the following statements, with reference to Multimodal Artificial Intelligence (AI):**
1. It refers to the integration of multiple modes of information or sensory data to facilitate human-like reasoning and decision-making.

2. Gemini is a multimodal large language model being developed by the OpenAI.
3. Gobi is a multimodal Artificial Intelligence developed by Google.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation:
· The multimodal model of artificial intelligence refers to the **integration of multiple modes of information or sensory data to facilitate human-like reasoning and decision-making**. It revolutionizes the way AI systems process and interpret information by seamlessly integrating various sensory modalities. **Multimodal systems allow users to engage with AI in several ways**. Unlike conventional Al models, which focus on a single data type**, multimodal Al systems have the capability to simultaneously comprehend and utilize data from diverse sources such as text, images, audio, and video. It is the next frontier of AI models.**
· Gemini is a multimodal large language model being developed by Google. Gobi is a multimodal AI being developed by the OpenAI. **Hence, statement 1 is correct.**

47. **Consider the following statements, with reference to the Dancing Frogs:**
1. The dancing frogs are endemic to Western Ghats.
2. The dance move named, Foot-flagging, serves the dual purpose of attracting a female and warning signs to other males in the area.
3. They are threatened by invasive species like mosquito fish, land use changes, and variations in temperature and humidity.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The Wildlife Trust of India after analysing the second edition of the Global Amphibian Assessment said the dancing frogs that are endemic to the Western Ghats are the most threatened amphibian genus of India. **Dancing frogs are members of the Micrixalus genus and there are about 24 frog species in this family.** Their preferred habitats are shola grasslands, myristica swamps and evergreen forests within the Western Ghats, where they mainly reside near slow-moving perennial streams. T**he dancing frogs that are found near the streams do a unique display to mate**. The males stretch up their hind legs one at a time and wave their webbed toes in the air in a rapid motion akin to a dance. T**he signature dance move is called 'foot-flagging' and serves the dual purpose of attracting a female while also sending out a warning signal to other male frogs in the area.** They are threatened by invasive species like mosquito fish, land use changes, and variations in temperature and humidity. It is also the 5th most threatened genus in the world with 92 % of its species in the threatened category. **Hence, all statements are correct.**

48. **Consider the following statements, with reference to the Electoral Bonds:**
1. They are interest-free bearer instruments in the nature of a promissory note to donate money anonymously to political parties.
2. Cash payment is not allowed for the transactions that are involved in the Electoral Bond scheme.

Which of the above statements is correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (C)
Explanation:
· The Supreme Court is about to hear petitions filed by two NGOs (Common Cause and Association for Democratic Reforms), challenging the scheme for lack of transparency and unlimited funding. **Electoral bonds are interest-free bearer instruments in the nature of a promissory note to donate money anonymously to political parties** that were announced in the 2017 Union Budget. **Hence, statement 1 is correct.**
· They are **sold in multiples of Rs. 1,000, Rs. 10,000, Rs. 1 lakh, Rs. 10 lakh, and Rs. 1 crore**. They can be bought from authorised branches of the State Bank of India (SBI). Under the electoral bonds scheme the donor is required to pay the amount only via cheque or a digital mechanism and cash payment is not allowed. **Hence, statement 2 is correct.**

49. **Consider the following statements regarding the Israel Palestine Conflict:**
1. After the Ottoman Empire was defeated in World War I, Britain gained control of Palestine.
2. In 1947, the United Nations voted to divide Palestine into separate Jewish and Arab states.
3. In 1948, Jewish leaders proclaimed the founding of Israel.

Which of the above statements is correct?
(a) 1 and 2 only
(b) 2 and 3 only

(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (D)
Explanation:
· After the Ottoman Empire was defeated in World War I, **Britain gained control of Palestine**, which was inhabited by a Jewish minority and Arab majority. **Hence, statement 1 is correct.**
· In 1947, the **United Nations voted to divide Palestine into separate Jewish and Arab states, with Jerusalem under international administration**. The Jewish leadership embraced the plan, but the Arab side rejected it, and it was never implemented. **Hence, statement 2 is correct.**
· In **1948, unable to end the strife, British authorities withdrew and Jewish leaders proclaimed the founding of Israel.** Many Palestinians objected, and a war ensued. Neighbouring Arab countries intervened with military force. Hundreds of thousands of Palestinians fled or were driven from their homes in what they call Al Nakba, or "The Catastrophe". **Hence, statement 3 is correct.**

50. **Ayyampalayam Nettai, recently seen in news, is a type of:**
(a) Rice
(b) Sugarcane
(c) Turmeric
(d) Coconut

Answer: (D)
Explanation: Ayyampalayam Nettai is a variety of coconut from Tamil Nadu, for which the local farmers are trying to get a GI Tag (geographical indication). It has a **high oil content and a sweet kernel**. It is drought & disease-resistant and promotes intercropping. **Hence, option (d) is correct.**

51. **Consider the following statements, with reference to Assisted Reproductive Technology (ART) in India:**
1. It is the handling of sperm or the oocyte outside the human body and transferring into the reproductive system of a woman.
2. In India, ART is open only to married couples.
3. Only a married woman with a child of her own can become a surrogate mother in India.

Which of the above statements 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: It defines **ART procedures as all techniques that attempt to obtain a pregnancy by handling the sperm or the oocyte (the immature female egg) outside the human body and transferring it into the reproductive system of a woman**. This is open to married couples, live-in partners, single women, and also foreigners. ART procedures include gamete donation, intrauterine insemination, and in-vitro fertilisation or IVF. The Surrogacy (Regulation) Act, 2021 (SRA) says the surrogate mother should be married and have a child of her own. **Hence, statement 2 is incorrect.**

52. **Consider the following statements regarding the Sovereign Green Bonds (SGB):**
1. They are fixed-income instruments designed to finance projects that have been specifically earmarked as climate or environment-related.
2. SGBs are issued by the Ministry of Finance and the Ministry of Environment Forest and Climate Change.
3. India is the only country to have issued SGBs exclusively to fund climate sustainability and green infrastructure projects.

How many of the statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: They are fixed-income instruments designed to finance projects that have been specifically earmarked as climate or environment-related. **The Reserve Bank of India (RBI) issues sovereign green bonds in line with global standards in India.** The proceeds will be deployed in public sector projects which help in reducing the carbon intensity of the economy. The issuance of green bonds is part of the Union Budget 2022-23 announcement. **India is among 25 other countries to have issued bonds to exclusively fund climate sustainability and green infrastructure projects and initiatives. Hence, statement 1 is correct.**

53. Consider the following statements regarding the Mahakal Temple:
1. The Mahakal temple is located in Ujjain in the state of Madhya Pradesh.
2. Ujjain is geographically situated at a spot where the zero meridian longitude and the Tropic of Cancer intersect.
3. The temple is built using both the Chalukya and Maratha styles of architecture.

How many of the statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The temple is located in Ujjain in the state of Madhya Pradesh**. There are 12 jyotirlinga sites in India, considered a manifestation of Shiva**. **12 temples: Mahakal, Somnath and Nageshwar in Gujarat, Mallikarjuna in Andhra Pradesh, Omkareshwar in Madhya Pradesh, Kedarnath in Uttarakhand, Bhimashankar, Triyambakeshwar and Grishneshwar in Maharashtra, Viswanath at Varanasi, Baidyanath in Jharkhand, and Rameshwar in Tamil Nadu.** Mahakal is the only jyotirlinga facing the south, while all the other jyotirlingas face east. The Mahakal temple is mentioned in several ancient Indian poetic texts. In the early part of the Meghadutam (Purva Megha) composed in the 4th century, Kalidasa gives a description of the Mahakal temple. It is **described as one with a stone foundation, with the ceiling on wooden pillars.** There would be no shikhara or spires on the temples prior to the Gupta period. The present five-storeyed structure was built by the Maratha general Ranoji Shinde in 1734, in the Bhumija, Chalukya and Maratha styles of architecture. A century later, its marble walkways were restored by the Scindias. **Ujjain is geographically situated at a spot where the zero meridian of longitude and the Tropic of Cancer intersect. Hence, all statements are correct.**

54. **Consider the following statements, with reference to the International Big Cat Alliance:**
1. It is a mega global alliance launched by India during the 50th anniversary of Project Tiger.
2. The alliance aims at the conservation of the world's seven principal big cats.

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 **International Big Cat Alliance (IBCA) is a mega-global alliance launched by India in April 2023 during the 50th anniversary of Project Tiger**. The Intergovernmental body has 97 countries with many Asian and African countries becoming a part of the alliance. Th**e alliance aims at the conservation of the world's seven principal big cats, which include the tiger, lion, snow leopard, leopard, jaguar, puma, and cheetah**. Through the alliance, the member nations exchange experiences, provide faster assistance to their neighbours and place a strong emphasis on capacity building. **Hence, both statements are correct.**

55. **With respect to the rescue missions conducted by India, consider the following pairs?**

Operations	Area of Operation
1. Operation Sukoon	Yemen
2. Operation Ajay	Israel
3. Operation Kaveri	Turkey

How many of the above pairs are correct?
(a) Only one pair
(b) Only two pairs
(c) All three pairs
(d) None

Answer: (A)
Explanation:
· **Operation Sukoon** was an operation launched by **the Indian Navy to evacuate Indian, Sri Lankan and Nepalese nationals,** as well as Lebanese nationals with Indian spouses, from the conflict zone during the 2006 Lebanon War.
· **Operation Safe Homecoming** was an operation launched by the **Indian government in 2011**, to evacuate its citizens who were fleeing from the **Libyan Civil War**.
· **Operation Raahat** was an operation of the Indian Armed Forces to evacuate Indian citizens and foreign nationals from Yemen during the 2015 military intervention by Saudi Arabia and its allies in that country during the Yemeni Crisis.
· India announced the launch of "**Operation Ajay" on Wednesday to help Indians stuck in Israel** return home as fresh tension triggered in the region as Hamas militants made a series of brazen attacks on Israeli towns over the weekend.
· Operation Kaveri is a codename for India's evacuation effort to bring back its citizens stranded in Sudan amid intense fighting between the army and a rival paramilitary force there.
Hence, only pair 2 is correctly matched.

56. **Consider the following statements, with reference to Global Hunger Index, 2023:**
1. India ranked 111 out of the 125 countries in the index.
2. The index is released by Concern Worldwide and Welthungerhilfe.
3. India has the highest child-wasting rate in the world at 18.7%.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)

Explanation: The Global Hunger Index, 2023 was recently released by the **Concern Worldwide and Welthungerhilfe**, **Non-Government Organisations from Ireland and Germany respectively.** The Global Hunger Index (GHI) is a tool for comprehensively measuring and tracking hunger at global, regional and national levels. **GHI scores are based on the values of 4 component indicators that include:**

· **Undernourishment** – The share of the population with insufficient caloric intake.

· **Child stunting** – The share of children under age five who have low height for their age, reflecting chronic undernutrition.

· **Child wasting** – The share of children under age five who have low weight for their height, reflecting acute undernutrition.

· **Child mortality** – The share of children who die before their fifth birthday, partly reflecting the fatal mix of inadequate nutrition and unhealthy environments.

In the 2023 Global Hunger Index, **India ranks 111th out of the 125 countries**. India has a score of 28.7 in the 2023 Global Hunger Index and has a level of hunger that is serious. **India has the highest child-wasting rate in the world at 18.7%. Afghanistan, Haiti and 12 sub-Saharan countries perform worse than India on the index. Hence, all statements are correct.**

57. **Consider the following statements, with reference to the Setu Bandhan Scheme:**

1. The scheme aims to improve inter-state connectivity, especially in the rural areas at the borders.
2. The scheme is an initiative of the Ministry of Road Transport and Highways.

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 the ministry of Road Transport and highways approved 7 bridge projects in Arunachal Pradesh under the Setu Bandhan Scheme. **The Setu Bandhan scheme has been introduced to improve inter-state connectivity**, especially in the rural areas at the borders where state roads do not get the required attention**. The scheme is an initiative of the Ministry of Road Transport and Highways (Morth).** The scheme is different from the "Setu Bharatam" scheme. Setu Bharatam is an ambitious programme with an investment of Rs. 50,000 crore to build bridges for safe and seamless travel on National Highways. The programme aims at making all national highways Railway Level Crossing free by 2019. **Hence, both statements are correct.**

58. **Consider the following statements, with reference to the Arabian Leopard:**

1. The Arabian leopard is the smallest leopard subspecies that is endemic to the Arabian Peninsula.
2. It has been listed as Critically Endangered on the International Union for Conservation of Nature (IUCN) Red List.
3. The global fund for the Arabian leopard is an initiative of the International Fund for Animal Welfare of IUCN.

How many of the statements given above are correct?

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

Answer: (B)

Explanation:

· The recent ongoing war between Israel and Palestine may be a threat to the declining population of the Arabian leopard. **Arabian leopard is the smallest leopard subspecies that is endemic to the Arabian Peninsula**. It is found in countries such as Egypt, Israel, Jordan, Oman, Saudi Arabia, the United Arab Emirates and Yemen. **Hence, statement 1 is correct.**

· Its population is estimated to contain fewer than 200 individuals. It has been **listed as Critically Endangered on the International Union for Conservation of Nature (IUCN) Red List. Hence, statement 2 is correct.**

· The **global fund for the Arabian leopard is an initiative of the Royal Commission for AlUla (RCU)**. AlUla is a City in Saudi Arabia and RCU is headed by the Crown Prince of Saudi Arabia, Mohammed bin Salman Al Saud. **Hence, statement 3 is not correct.**

59. **Consider the following statements regarding the 2028 Olympics:**

1. It will be held in Paris, France.
2. The International Olympic Committee recently approved cricket to be included in the 2028 Olympics.

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: The **International Olympic Committee** recently approved cricket for **the 2028 Los Angeles Olympics**. Cricket along with baseball/softball, flag football, squash and lacrosse will be included in the 2028 LA Olympics. **Hence, statement 1 is incorrect.**

60. **Consider the following statements, with reference to White Phosphorus:**
1. It is insoluble in water but soluble in organic solvents.
2. It is utilized in the production of safety matches, flame retardants, and in the semiconductor industry.
3. It exhibits semiconductor properties and is used in electronic and optoelectronic devices.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation:
· White phosphorus exists in different allotropes and is the **most reactive and least stable among all the elemental forms of phosphorus**. It is insoluble in water but soluble in organic solvents, and it readily catches fire when exposed to air. **Hence, statement 1 is correct.**
· Red phosphorus is a more stable form, utilized in the production of safety matches, flame retardants, and in the semiconductor industry. **Hence, statement 2 is not correct.**
· Black phosphorus exhibits semiconductor properties and is used in electronic and optoelectronic devices. **Hence, statement 3 is not correct.**

61. **Consider the following statements**
1. Millets are fundamentally grasses.
2. Millets are becoming more popular in India as well because of their low input requirements and high nutritional density.

Which of the above statements is correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (C)
Explanation: Millets, which are essentially grasses, are grown worldwide, with a focus on tropical regions of Africa and Asia, where they are cultivated as cereal crops. **Some common varieties include pearl millet (Cenchrus americanus), barnyard millet (Echinochloa utilis), finger millet (Eleusine coracana), and foxtail millet (Setaria italica).** The rising popularity of millets in India can be attributed to their low input demands and high nutritional density, qualities that are particularly valuable for a nation anticipating substantial food security challenges in the upcoming decades.

62. **Consider the following pairs:**
1. Article 16(4A) - Abolishes untouchability and prohibits its practice.
2. Article 17 - Reservation in promotions for underrepresented SCs/STs in government jobs.
3. Article 46 - Directs the State to promote the educational and economic interests of SCs.

How many of the above pairs are correctly matched?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: Constitutional provisions for the upliftment of SCs:
1. **Article 15(4)** outlines special provisions aimed at promoting the advancement of specific groups.
2. **Article 16(4A)** addresses the **concept of "reservation in promotions for certain categories, like SCs/STs**, who are underrepresented in government services."
3. **Article 17** abolishes the practice of Untouchability.
4. **Article 46** mandates that the State should actively promote the educational and economic welfare of marginalized communities, particularly the Scheduled Castes and Scheduled Tribes, while also safeguarding them from social injustice and exploitation.
5. **Article 335** emphasizes that while making appointments to government services and positions, the claims of Scheduled Castes and Scheduled Tribes must be considered, provided it does not compromise administrative efficiency.
6. **Article 330 and Article 332** in the Constitution respectively stipulate the reservation of seats for Scheduled Castes and Scheduled Tribes in the House of the People and the legislative assemblies of the States.
7. **Parts IX and IXA** of the Constitution deal with Panchayats and Municipalities, respectively, and introduce provisions for the reservation of seats for SC and ST members in local governing bodies.

63. **Consider the following statements in connection with the biasing of semiconductor diodes:**
1. LEDs operate in a forward bias mode.
2. Photodiodes function in a forward bias mode.
3. Zener diodes are employed in a reverse bias mode.
4. Variable capacitance diodes are utilized in a reverse bias mode.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (C)
Explanation:

1. Light-Emitting Diode (LED):

- An LED is a **semiconductor device** that emits visible light when an electric current flows through it.
- LED operation occurs exclusively in the forward bias condition.
- In the junction or depletion region, **free electrons combine with holes in the positive ions, leading to light emission.**

2. Photodiode:

- A photodiode is a specialized p-n junction diode designed with a transparent window, allowing light to illuminate the diode.
- It functions under reverse bias.

3. Zener Diode:

- A **Zener diode operates similarly to a PN junction diode in forward bias**, but it distinguishes itself by conducting in reverse bias above its threshold or breakdown voltage.
- Zener diodes operate in the breakdown region.

4. Variable Capacitance Diodes (Varactor Diodes):

- Variable capacitance diodes, also known as **varactor diodes, adjust their capacitance in response to applied voltage bias.**
- They are typically utilized in the reverse bias condition because their capacitance is responsive to the voltage applied across them in this state, commonly found in electronic tuning circuits.

64. **With reference to technologies for solar power production, consider the following statements:**
1. Photovoltaics is a technology that directly converts light into electricity to generate power.
2. Solar Thermal technology harnesses solar energy to produce heat, which is subsequently employed in the electricity generation process.
3. India possesses a manufacturing base for Solar Thermal technology but lacks one for Photovoltaics.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: Photovoltaics (PV) is indeed a **technology that directly converts light into electricity,** which is used to generate power.
Solar thermal heating is the **utilisation of solar energy to provide process heat, especially in crop drying, water heating, cooking or space heating and cooling.**

The statement about India's manufacturing base for solar technologies is not accurate. **India has manufacturing facilities for both Solar Thermal and Photovoltaic technologies.** It has been making efforts to expand its capacity in the field of solar power generation, including both types of technologies.

65. **Which of the following sets of countries share a border with Serbia?**
(a) Romania, Greece, and Bulgaria,
(b) Croatia, Hungary, and North Macedonia,
(c) Montenegro, Bosnia and Herzegovina, and Croatia,
(d) Albania, Kosovo, and Bulgaria.

Answer: (C)
Explanation:

66. **Consider the following statements:**
1. The Ecomark scheme is under the LiFE Initiative and is administered by the Ministry of Environment, Forest and Climate Change (MoEFCC).
2. The Green Credit Programme is a market-based mechanism that focuses on afforestation and water conservation.
3. The Green Credit programme is implemented by the Indian Council of Forestry Research and Education (ICFRE).

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:

- Ahead of the COP 28, set to be held in **Dubai in November-December 2023**, the Union government has notified two initiatives namely the **Eco Mark Scheme and the Green Credit Programme**. The Ministry of Environment, Forest and Climate Change has introduced **2 pioneering initiatives to promote the country's proactive approach to climate change.** These initiatives seek to encourage environmentally friendly practices rooted in tradition and conservation; reflecting the ideas of the LiFE concept. **The Green Credit Program (GCP) is an innovative market-based mechanism designed to incentivize voluntary environmental actions.**
- The environmental actions include diverse sectors such as various stakeholders like individuals, communities, private sector industries and companies. GCP will focus on water conservation and afforestation**. The Indian Council of Forestry Research and Education (ICFRE) serves as the GCP Administrator**, responsible for program implementation, management, monitoring, and operation. Ecomark Scheme promotes Eco-Friendly Products. It 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 Eco mark Scheme in partnership with the Bureau of Indian Standards (BIS). Hence, statement 1 is incorrect.**

67. **Consider the following passage:**
It is a natural freshwater wetland. It is also known as Gokhur Lake. It is the only Ramsar site and the largest oxbow lake that is located in Bihar. The Lake has been drying up since 2010.

The above passage best describes which of the following lakes?
(a) Anshupa Lake
(b) Kawar Lake
(c) Gogabil Lake
(d) Ghogha Lake

Answer: (B)
Explanation: Bird hunting and land acquisition threaten Kawar Lake and it is on the verge of drying up**. It is also known as Gokhur Lake. It is a natural freshwater wetland**. It is the **only Ramsar site that is located in Bihar**. To be designated as a Ramsar site, wetlands must meet certain criteria, the most important of which is that they should be rare and natural. The second most important is that they should support the life cycle of endangered species in adverse conditions. This lake draws water from the confluence of the **Gandak, the Bia and the Kareh rivers**. **Hence, option (b) is correct.**

68. **Consider the following statements, with reference to the African swine fever:**
1. It is a highly contagious and deadly viral disease that affects both domestic and feral swine of all ages.
2. It is endemic to Africa and not a threat to human health.

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: Recently Manipur's Imphal witnessed the outbreak of the African swine fever. **African swine fever is a highly contagious and deadly viral disease affecting both domestic and feral swine of all ages**. ASF is not a threat to human health and cannot be transmitted from pigs to humans. It is found in countries around the world. **ASF is a different disease from swine flu. The clinical signs of ASF may occur in chronic, sub-acute or acute form**. The incubation period for ASF is variable but is usually between 5 and 15 days. Traditionally this serious disease has occurred mainly in Africa with the only endemic area in the European Union (EU) being the Italian island of Sardinia. **However, since 2017 the disease has also been reported in Central and Eastern Europe**. **Hence, statement 2 is not correct.**

69. **The 75/25 initiative of the Indian government is related to:**
(a) Providing a standard of care for 75 million individuals with hypertension and diabetes by 2025.
(b) Immunization of 75 million under 12 year's children by 2025
(c) Reduction of 75% carbon emission from the thermal power plant by 2025
(d) Promoting the investment model with the sharing of 75 per cent of private institutions and 25 per cent of government.

Answer: (A)
Explanation: Recently, the **World health summit, 2023 takes place in Berlin, Germany and online from 15–17 October under the theme "A Defining Year for Global Health Action".** During the summit, India highlighted the efforts at reducing non-communicable diseases, **"India has launched the 75/25 initiative, aimed at screening and providing a standard of care for 75 million individuals with hypertension and diabetes by 2025**. It marks the most extensive expansion of NCDs

in primary healthcare globally". **Hence, option (a) is correct.**

70. **Consider the following statements, with reference to Aerosols:**
1. Aerosols are tiny solid particles suspended in the atmosphere.
2. These are formed only by natural processes such as dust storms, sea spray, volcanic eruptions, and wildfires.
3. Aerosols can vary widely in size.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Aerosols are tiny solid or liquid particles suspended in the atmosphere. **Natural Aerosols are formed by natural processes such as dust storms, sea spray, volcanic eruptions, and wildfires. Anthropogenic Aerosols are generated from human activities, including industrial processes, vehicle emissions, and the burning of fossil fuels.** Aerosols can vary widely in size, ranging from a few nanometers to several tens of micrometres. They can consist of sulfates, nitrates, organic compounds, black carbon, mineral dust, and sea salt, among other components. **Hence, statement 2 is not correct.**

71. **With reference to Karaavali skittering frog, consider the following statements:**
1. This frog is named after a coastal region of Karnataka.
2. They are endemic to Western Ghats and the Indo-Burma region.
3. It is considered to be endangered due to its restricted geographic area.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The Karaavali skittering frog is among the 200-odd new amphibian species discovered over the past few decades, many of which are in the biodiversity hotspots of the Western Ghats and the Indo-Burma region**. This frog is named Euphlyctis Karaavali after Karaavali, the coastal region of Karnataka.** The Karaavali skittering frog is considered to be endangered due to its restricted geographic area. **The frog belongs to a group known as "skittering frogs", because of their habit of floating on water and skittering away when disturbed.** Even as biologists celebrate the discovery of new species, they are aware of the grim reality facing amphibians, the most threatened vertebrate class in the world. **Hence, all statements are correct.**

72. **Chungthang dam, recently seen in the news is located in:**
(a) Ladakh
(b) Arunachal Pradesh
(c) Himachal Pradesh
(d) Sikkim

Answer: (D)
Explanation: The Chungthang dam of Sikkim Urja's 1,200-MW Teesta-III hydroelectric project on the Teesta River gave way on October 4, leading to the death of at least 94 people in the downstream areas of Sikkim and West Bengal. **Sikkim's biggest hydro power project Sikkim Urja (formerly Teesta Urja) has suffered massive damage due to the flash flood** as the dam and the bridge connecting the powerhouse have been washed away. **Hence, option (d) is correct.**

73. **With reference to Rasmussen's encephalitis, consider the following statements:**
1. It is an extremely rare, chronic inflammatory neurological disease.
2. It often results in permanent disabilities.
3. Brain Surgery is the only treatment.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Rasmussen's encephalitis is an extremely rare, chronic inflammatory neurological disease. The patient usually experiences frequent episodes of uncontrolled electrical disturbances in the brain that cause epileptic seizures (epilepsy) and progressive cerebral destruction. **Hence, statement 1 is correct.**
The exact cause of this disorder is not known. **The two leading ideas are that brain inflammation might be a reaction of a foreign antigen (infection) or an autoimmune disease limited to one side of the brain resulting in brain damage**. It occurs mostly, but not always, in children between the ages of two and ten years. After the peak inflammatory response is reached, the progression of this disorder appears to slow or stop, and the patient is left with permanent neurological deficits. It often results in permanent disabilities such as **epilepsy, paralysis, and cognitive problems. Hence, statement 2 is correct.**

Treatment:-

1. **Antiseizure Medications:** These medications are often used to manage seizures, although they might not completely eliminate them.
2. **Immunotherapy:** Early use of immunotherapy may help control seizures or prevent further immune-related brain damage.
3. **Brain Surgery (Hemispherectomy):** It involves the removal or disconnection of half of the patient's brain from the rest of the brain. **Hence, statement 3 is not correct.**

74. **Consider the following statements regarding the Special Leave Petition (SLP):**

1. By virtue of Article 137 the Supreme Court of India can grant special leave to appeal from any judgment passed or made by any court or tribunal in the territory of India.
2. A Special Leave Petition can be filed for any civil or criminal matter.

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: The Supreme Court of India has been given extraordinary jurisdiction under **Article 136 of the Constitution.** By virtue of this Article, the **court can grant special leave to appeal from any judgment, decree, determination, sentence, or order in any cause or matter, passed or made by any court or tribunal in the territory of India** (with the exception of military tribunals and court-martial). **Hence, statement 1 is not correct.**

Any aggrieved party can file SLP against judgement or order of refusal of grant of certificate for appeal to SC. **An SLP can be filed for any civil or criminal matter, etc.** It can be filed against any judgment of the High Court within 90 days from the date of judgment or **it can be filed within 60 days against the order of the High Court** refusing to grant the certificate of fitness for appeal to SC. **Hence, statement 2 is correct.**

75. **Consider the following statements regarding the Green Credit Programme (GCP):**

1. Under the farmer's producer's organisations Gram panchayats aim to incentivise environmentally conscious practices and promote a sustainable lifestyle through a market-based mechanism.
2. The Programme is implemented by the Indian Council of Forestry Research and Education (ICFRE), an autonomous organisation under the MoEFCC.

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: GCP **aims to incentivise environmentally conscious practices and promote a sustainable lifestyle through a market-based mechanism.** As per the scheme, individuals, industries, farmers producer's organisations (FPOs), urban local bodies (ULB), gram panchayats, and the private sector, among a host of other entities, will be able to earn green credit for undertaking environment-friendly actions. The green credits generated or procured by industries, companies and other entities to fulfil any legal obligation cannot be traded. **The Indian Council of Forestry Research and Education (ICFRE), an autonomous organisation under the MoEFCC**, is responsible for effectively implementing the Green Credit programme, including its management and operation. **Hence, both statements are correct.**

76. **Consider the following statements, with reference to the QR codes:**

1. Quick response (QR) codes are square-shaped matrices of dark or light pixels.
2. It is used to encode and quickly retrieve data using computer devices.
3. It is completely different from barcodes.

How many of the statements given above are correct?

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

Answer: (B)

Explanation: Recently Cybersecurity experts have found hackers using Quick response (QR) codes for phishing activities**. A quick response (QR) code is a type of barcode that can be read easily by a digital device and which stores information as a series of pixels in a square-shaped grid**. QR codes are frequently used to track information about products in a supply chain and are often used in marketing and advertising campaigns. It **was invented by Masahiro Hara, a Japanese engineer in 1994**. An enhancement on traditional barcodes, QR codes can store vastly more information and are used in a variety of applications from supply chain management to cryptocurrency wallet addresses. **QR codes have become more widespread in facilitating digital payments and in cryptocurrency**. **The Trellix Advanced Research Centre recently noticed an attack campaign with an acute spike of phishing emails that use QR codes.** Phishing is an attempt by cybercriminals posing as legitimate

institutions, usually via email, to obtain sensitive information from targeted individuals. **Hence, statement 3 is not correct.**

77. **Consider the following statements, with reference to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA):**
1. It is an open-ended intergovernmental scientific advisory body established by the Convention on Biological Diversity.
2. It provides timely advice relating to the implementation of the Convention.
3. The 25th meeting of SBSTTA was held in Delhi, India.

How many of the statements given above are not correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: The **Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) recently conducted a meeting in Nairobi to gauge progress on the Kunming-Montreal Global Biodiversity Framework**. It is an open-ended intergovernmental scientific advisory body established by **Article 25 of the Convention on Biological Diversity**. It provides the Conference of the Parties (COP) and its other subsidiary bodies, with timely advice relating to the implementation of the Convention. It is a **subsidiary body of the COP that reports regularly to the COP on all aspects of its work.** SBSTTA comprises government representatives competent in the relevant field of expertise. **Its functions include:**
- Providing assessments of the status of biological diversity,
- Providing assessments of the types of measures taken in accordance with the provisions of the Convention and
- Responding to questions that the COP may put to the body.

The 25th meeting of SBSTTA was held in Nairobi, Kenya. **Hence, statement 3 is not correct.**

78. **Consider the following statements regarding Niobium:**
1. It is a pliable and soft metal that lives in its purest form freely in nature.
2. It has the ability to become superconducting at very low temperatures.

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: The **Union Cabinet recently approved royalty rates with respect to 3 critical and strategic minerals, namely, lithium, niobium, and Rare Earth Elements**. It is a rare, soft, malleable, ductile, grey-white metal. It must be placed in a protective atmosphere when processed at even moderate temperatures because it tends to react with oxygen, carbon, halogens, nitrogen, and sulfur. It is not found free but in minerals such as columbite and tantalite. **Hence, statement 1 is not correct.**
It has the property of becoming superconducting at low temperatures**. Brazil is the world's largest supplier of this metal.** It is **used for the production of high-temperature-resistant alloys and special stainless steels.** It is also used in its pure form to make superconducting accelerating structures for particle accelerators. Niobium alloys are used in surgical implants because they do not react with human tissue. **Hence, statement 2 is correct.**

79. **Consider the following statements regarding "Bharatiya Antariksha Station" or Indian Space Station (BAS/ISS):**
1. The Indian Prime Minister has directed the Indian Space Agency (ISRO) to set up an indigenous space station (BSS/ISS) by 2035 and land an Indian on the moon by 2040.
2. The International Space Station or ISS, orbiting in low earth orbit (LEO), is expected to be decommissioned by 2030.

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: Signalling a road map for India's future space ambitions, Prime Minister Narendra Modi has directed the Indian Space Agency (ISRO) to set up an Indian-crafted, indigenous space station by 2035 and land an Indian on the moon by 2040. **This follows preparations for the Gaganyaan mission — India's first manned mission to space, scheduled for 2025**. The International Space Station or ISS, orbiting in low earth orbit (LEO), developed and maintained by the U.S., Russia, Canada, Japan, and European agencies, is the largest space station but is expected to be decommissioned by 2030. **Hence, both statements are correct.**

80. **Consider the following passage:**

It is the small raptor of the Falcon family. It is the world's longest-travelling raptor. It is protected under Schedule IV of the Wildlife Protection Act 1972. It is locally known as 'Akhuipuina' in the northeast region.

The above passage best describes which of the following birds?
(a) Bearded vulture
(b) Little owl
(c) Bald eagle
(d) Amur falcon

Answer: (D)
Explanation: The Amur falcons are expected to arrive in many parts of northeast India from the second week of October. **Amur falcon is a small but long-distance migrant bird of prey that breeds in Eastern Russia and China**. It is the small raptor of the Falcon family. **They are locally known as 'Akhuipuina' in the northeast region**. It annually flies around 22,000 km all the way across Asia, over the Indian Ocean to wintering grounds in Southern Africa. **Amur falcon is the world's longest-travelling raptor. It is protected under Schedule IV of the Wildlife Protection Act 1972. Hence, option (d) is correct.**

81. **Consider the following statements with respect to the Election Seizure Management System (ESMS):**
1. It is a technology platform for real-time updates that ensures seamless coordination amongst enforcement agencies during elections.
2. It was introduced by the election commission during the 16th Lok Sabha election in 2014.
3. The platform was developed by the National Informatics Centre (NIC).

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 election commission introduced the 'Election Seizure Management System' to increase transparency in the election. **The Election Seizure Management System is a new technology-driven platform for real-time updates on seizures from the field by multifarious state and central enforcement agencies.** The system ensures seamless coordination and intelligence sharing amongst enforcement agencies. **The platform was developed by the Election Commission of India (ECI)**. It will also monitor action taken by central and state enforcement agencies against such offences. The enforcement agencies are required to upload details of every recorded movement and seizure of illicit cash, liquor, drugs etc. **The ESMS is set to be introduced by the Election Commission in the upcoming assembly elections in 5 states, scheduled for November 2023**. It keeps a record of the seizure of cash, drugs and freebies to induce voters during the assembly poll in 5 states. It will also facilitate qualitative analysis and planning. **Hence, only statement 1 is correct.**

82. **Consider the following statements, with reference to Marine Cloud Brightening:**
1. It refers to an albedo modification technique that aims to increase the reflectivity of certain clouds.
2. Long-term benefits are only possible if the cloud brightening activity occurs alongside aggressive emissions reductions.

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 recent times several Australian organisations have explored the possibilities to reduce coral bleaching with the help of marine cloud brightening. **Marine Cloud Brightening is also called as Cloud Whitening and Cloud Brightening**. It is a geoengineering technique designed to increase the reflectance of Earth's cloud cover to reduce the amount of incoming solar radiation striking Earth's surface**. Marine cloud brightening refers to an albedo modification technique that aims to increase the reflectivity of the clouds. It was originally proposed by John Latham in 1990** as a way to control global warming by altering Earth's energy balance. Cloud brightening has both risks as well as benefits. Long-term benefits are only possible if the cloud-brightening activity occurs alongside aggressive emissions reductions. **Hence, both statements are correct.**

83. **Consider the following statements regarding the Muthuvan tribe:**
1. They have a distinct government system known as the "Kani System."
2. They reside in a highland forest that straddles Karnataka and Maharashtra.

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: The Muthuvan tribe will be involved in the Nilgiri Tahr conservation initiative, according to

the Tamil Nadu Forest Department. These people reside in the hill jungles that separate Kerala and Tamil Nadu. They speak somewhat distinct dialects and are known as Malayalam Muthuvan and Pandi Muthuvan, respectively. They are animists and spirit worshipers who also believe in forest gods. They think that their ancestors' ghosts will be the first to go to the highland forests. With their traditional knowledge, they are noted for coexisting with animals. T**he 'Kani form' is a unique form of governance that these indigenous people follow. Each village is led by a 'Kani', who is in charge of the village's administration.** They are experts in traditional remedies that are extremely effective, and these medications and medicine men are kept secret and passed down through generations. Agriculture is the main employment of these Muthuvan tribes, who produce a variety of items such as **ragi, cardamom, and lemongrass. Hence, statement 2 is not correct.**

84. **Consider the following statements, with reference to the WorldSkills Competition:**
1. It is the largest skill competition in the world which will be held once every two years.
2. It will be conducted by WorldSkills International which has 86 member countries including India.
3. India has secured the top position in the competition surpassing China.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:
- Recently the Ministry of Skill Development and Entrepreneurship felicitated the winners of the WorldSkills Competition. **WorldSkills Competition is the largest skill competition in the world, held once every two years. Hence, statement 1 is correct.**
- It is **conducted by WorldSkills International**, which has 86 member countries including India. **Hence, statement 2 is correct.**
- These competitions provide both a benchmark for high performance and an objective way to assess vocational excellence. **WorldSkills Competition 2022 – It had 62 skill competitions were held over 12 weeks in 15 countries and regions between 7 September and 26 November 2022**. **India secured 11th position in the Total Medal Points and secured 4th position in the total points**. Chinese Taipei secured 1st in total points and China secured 1st position in total medal points. **Hence, statement 3 is not correct.**

85. **Consider the following pairs:**

GI products	States
1. Yak churpi	Arunachal Pradesh
2. Khaw Tai	Meghalaya
3. Tangsa textile	Ladakh

How many of the statements given above pairs are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation:
- Recently 3 indigenous products of Arunachal Pradesh such as **Yak churpi, Khamti rice & Tangsa textile received a GI tag.**
- Yak Churpi is the **first ever yak milk product, Arunachal Yak Churpi, to receive the Geographical Indication**.
- Khaw Tai is a chewy sticky rice variety of the Namsai region being cultivated by traditional Khampti tribal farmers in Arunachal Pradesh.
- **Tangsa textile** – Textile products of the Tangsa tribe of Changlang district, Arunachal Pradesh are famous for their exotic designs and colours.

Hence, only pair 1 is correctly matched.

86. **Consider the following statements with reference to Amrit Kaal Vision 2047:**
1. It is the long-term blueprint for the Indian maritime blue economy for enhancing ports, promoting sustainable practices and facilitating global collaboration.
2. It aims to quadruple port capacity to 10,000 million tonnes per annum (mtpa) by 2047.
3. The vision includes a strategy to make major ports carbon-neutral and push for domestic hydrogen production and distribution.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: At the Global Maritime India Summit 2023 Prime Minister Narendra Modi unveiled 'Amrit Kaal Vision 2047', a blueprint for the Indian Maritime blue economy. **Amrit Kaal Vision 2047 is the long-term**

blueprint for the Indian maritime blue economy for enhancing ports, promoting sustainable practices and facilitating global collaboration. The blueprint outlines strategic initiatives aimed at enhancing port facilities, promoting sustainable practices and facilitating international collaboration. It includes strategies to make major ports carbon-neutral and push for domestic hydrogen production and distribution. **It aims to quadruple port capacity to 10,000 million tonnes per annum (mtpa) by 2047, aiming to get 100 % public-private partnership (PPP) for 12 major ports**. Global Maritime India Summit 2023 is the 3rd edition of the summit that was held in Mumbai. **Hence, all statements are correct.**

87. **Consider the following pairs:**

Operations	Objectives
1. Nanhe Faristey	Rescue of children and reuniting them
2. AAHT	Curbing Human traffickers
3. Uplabdh	Redressal of security related complaints
4. Yatri Suraksha	Legal action against touts

How many of the pairs given above are correct?
(a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (B)
Explanation: Nanhe Faristey, AAHT, Uplabdh and Yatri Suraksha are operations of the Railway Protection Force (RPF) to protect railway property, passenger areas and passengers.

1. **Operation 'Nanhe Faristey' –** The operation aims to rescue children and reunite them with their families. **Hence, pair 1 is correctly matched.**
2. **Operation 'AAHT' –** It is an effective operation to curb the evil plans of Human traffickers. **Hence, pair 2 is correctly matched.**
3. **Operation 'Uplabdh' –** In this operation the touts were arrested and legal action was taken against them as per law. **Touts are the persons who sell tickets unofficially, at a much higher price than the official price, especially outside a theatre, stadium, railway station and other places. Hence, pair 3 is not correctly matched.**
4. **Operation 'Yatri Suraksha' -** In order to redress security-related complaints of passengers in distress and for immediate assistance, this operation was launched. **Hence, pair 4 is not correctly matched.**

88. **Consider the following statements, with reference to the Microbial Rhodopsins:**
1. Rhodopsin is a light-responsive protein that helps the microalgae flourish with the help of sunlight in place of traditional chlorophyll.
2. Rhodopsins were found to be more concentrated in high latitudes, where there is more mixing of ocean waters and lower concentrations 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: (A)
Explanation: Recently researchers have observed that the **Microalgae are adapting to a warming climate, and declining nutrient levels in seas with the help of the Rhodopsin protein**. The warmer the surface water gets, the lower the nutrients in these surface water layers. **There is less mixing between the surface waters and nutrient-rich deeper waters as the oceans warm. So nutrients become scarce at the surface, impacting the primary producers such as microalgae that are present in the top layer**. Microalgae form the base of the food chain in the ocean and capture carbon dioxide from the atmosphere. For algae to produce food and remove carbon dioxide from the atmosphere, they need sunlight. Microbial rhodopsins may absorb as much light as chlorophyll-based photosynthesis in the sea, which also captures light to generate energy and food. **Rhodopsin is a light-responsive protein that helps the microalgae flourish with the help of sunlight in place of traditional chlorophyll**. **Hence, statement 1 is correct.**
Microbial rhodopsins may have the potential to reduce the negative effects of changing environmental conditions, such as ocean warming and even the reduction in the productivity of crops. The same mechanism could be deployed to enhance the activity of microbes that cannot use light, such as yeast. Rhodopsins were found to be more concentrated in low latitudes, where there is less mixing of ocean waters and lower concentrations of nutrients, including dissolved iron. **Hence, statement 2 is not correct.**

89. **With reference to 'General Provident Fund (GPF)', consider the following statements:**
1. It is a provident fund account that is available for both government and private employees.
2. It is a mandatory scheme, requiring them to contribute a certain percentage of their salary towards the fund.

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: It is a type of provident fund account that is available only for government employees in India. **The primary objective of this fund is to provide a dependable source of retirement income for government employees**. It allows government employees to accumulate savings over their employment tenure. **Hence, statement 1 is not correct.**
It is a **mandatory scheme for government employees, requiring them to contribute a certain percentage of their salary towards the fund.** The contributions are deducted from the employee's monthly salary, and the amount earns interest at a predetermined rate. **Employees can also increase the GPF deductions as per their choice**. **Hence, statement 2 is correct.**

90. **Which state recently started the 'Samadhan Scheme' for the settlement of arrears of tax, penalty, or interest pertaining to various taxes administered under Commercial Taxes?**
(a) Tamil Nadu
(b) Uttar Pradesh
(c) Madhya Pradesh
(d) Rajasthan

Answer: (A)
Explanation: In the recently-concluded assembly session, **Tamil Nadu Chief Minister M. K. Stalin announced the 'Samadhan Scheme' for the settlement of arrears of tax**, penalty or interest pertaining to various taxes administered under Commercial Taxes. **Hence, option (a) is correct.**

91. **Consider the following statements, with reference to the Minimum Support Price (MSP):**
1. It will be fixed by the government on the basis of recommendations of the Commission for Agricultural Costs and Prices (CACP).
2. The Rangarajan Commission recommended that the MSP should at least be 50% more than the weighted average.
3. In India, MSPs are applicable to 22 kharif, rabi and commercial crops including sugarcane.

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 union government announced the Minimum Support Price (MSP) for 6 Rabi crops for the 2024-25 marketing season with the old formula for MSP. **Minimum Support Price (MSP) is a form of market intervention by the Government of India to insure agricultural producers against any sharp fall in farm prices**. MSPs are announced by the Government of India at the beginning of the sowing season for certain crops on the basis of the recommendations of the Commission for Agricultural Costs and Prices (CACP). **Hence, statement 1 is correct.** The **Swaminathan Commission recommended that the MSP should at least be 50 % more than the weighted average CoP, which it refers to as the C2 cost. Hence, statement 2 is not correct. The** minimum support prices (MSPs) are mandated for 14 crops of the kharif season, 6 rabi crops and 2 other commercial crops (Cotton and Jute) excluding sugar cane. **Hence, statement 3 is not correct.**

92. **Consider the following statements, with reference to the Ghar-Ghar KCC Abhiyaan:**
1. It is a campaign to extend the benefits of the Kisan Credit Card (KCC) Scheme to every farmer including fish farmers across India.
2. NABARD is the Primary Executing Organization for this scheme.

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: Nirmala Sitharaman, Union Finance Minister and Narendra Singh Tomar, Union Agriculture Minister recently launched the Ghar-Ghar KCC Abhiyaan to Ensure Kisan Credit Card Access for Fish Farmers. **Ghar-Ghar KCC Abhiyaan is a transformative initiative to ensure Kisan Credit Card Access for Fish Farmers.** It enhances financial inclusion and support for the fisheries sector. It ensures that every eligible farmer the access to essential financial tools. **NABARD is the Primary Executing Organization for this scheme**. By expanding the reach of the KCC scheme, this campaign will promote financial inclusion in rural areas and bolster the economic well-being of farmers. **Hence, both statements are correct.**

93. **Consider the following statements, with reference to the Golden Peacock Award:**
1. It is regarded as a benchmark award of Corporate Excellence worldwide that was instituted by the Institute of Directors, India in 1991.

2. The REC Limited, a Central Public Sector Enterprise received the award the Golden Peacock Award in Risk Management in 2023.

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: The **Golden Peacock Awards, instituted by the Institute of Directors, India in 1991, are now regarded as a benchmark of Corporate Excellence worldwide**. Golden Peacock Awards for Corporate Leadership and Institutional Excellence, over time, have become a hallmark of excellence, both locally and globally. Award winners are eligible to use the Golden Peacock Awards Logo with year on all printed and promotional materials, which evidences the highest accolade received by the organisation. **The Awards are bestowed annually and are designed to encourage total improvement in each sector of our business**. REC Limited was honoured with the Golden Peacock Award in Risk Management in 2023. **REC is a 'Maharatna' company under the administrative control of the Ministry of Power. Hence, both statements are correct.**

94. **The 2023 Nobel Prize for Economics (Sveriges Riksbank Prize in Economic Sciences) was awarded to Claudia Goldin for her work on:**
(a) Research on banks and financial crises
(b) Auction theory
(c) Global poverty alleviation
(d) Female labour force participation

Answer: (D)
Explanation: The **Royal Swedish Academy of Sciences awarded the prestigious Sveriges Riksbank Prize in Economic Sciences, known as the Nobel for Economics, for 2023 to Harvard University Professor Claudia Goldin**. Recognized for her profound contributions to understanding women's labour market outcomes, Professor Goldin has delved deep into historical archives, spanning over two centuries, to unravel the complexities of f**emale labour force participation (FLFP/Female LFPR).** Her research challenges traditional narratives, revealing a U-shaped curve in women's labour force engagement, highlighting the intricate interplay of societal expectations, technological advancements, legislation, and individual choices. **Hence, option (d) is correct.**

95. **Consider the following statements regarding the Broadcasting Content Complaints Council:**
1. It operates as an independent self-regulatory body.
2. Chairperson is typically a retired Judge from the Supreme Court or High Court.
3. The BCCC's self-regulatory approach empowers the broadcasting industry to have a say in content regulation.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The Broadcasting Content Complaints Council (BCCC) operates as an independent self-regulatory body. It is **affiliated with the Indian Broadcasting Foundation (IBF),** which is an industry association of television broadcasters in India. **The BCCC comprises thirteen members, including a Chairperson who is typically a retired Judge from the Supreme Court or High Court.** The BCCC's self-regulatory approach empowers the broadcasting industry to have a say in content regulation. This approach strikes a balance between providing creative freedom for content creators and the responsibility to ensure that content aligns with established norms and community standards, thus upholding public expectations while fostering creative expression. **Hence, all statements are correct.**

96. **Consider the following statements, with reference to NaMo Bharat:**
1. It is a multimodal semi-high-speed regional rapid transit system that ensures balanced and sustainable urban development.
2. It connects western India with eastern India from Jaipur in Gujarat to Kolkata in West Bengal.
3. National Capital Region Transport Corporation (NCRTC) which comes under the Ministry of Home Affairs is the implementing agency for Namo Bharat.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: India's first indigenous mass rapid system, RRTS covering the Delhi-Ghaziabad-Meerut section was inaugurated recently. Regional Rapid Transit System (RRTS) is a new rail-based, semi-high-speed, high-frequency commuter transit system dedicated to regional connectivity. **RRTS, now called as NaMo Bharat, was designed with a speed of 180 kmph. It is modelled on systems such as the RER in Paris, Germany, Austria and the USA**. It is a multimodal

semi-high-speed regional rapid transit system that ensures balanced and sustainable urban development. **Hence, statement 1 is correct.**

8 RRTS corridors have been identified for development in the NCR. Phase - I: Out of 8, 3 corridors have been prioritised to be implemented in Phase I. Delhi-Ghaziabad-Meerut Corridor, Delhi-Gurugram-SNB-Alwar Corridor, Delhi-Panipat Corridor Construction & Implementation – National Capital Region Transport Corporation (NCRTC), a joint venture of Union government and the governments of Delhi, Haryana, Rajasthan and Uttar Pradesh. **NCRTC comes under the Ministry of Housing and Urban Affairs. Hence, statements 2 and 3 are not correct.**

97. **Consider the following statements, with reference to Cyclone Tej:**
1. It is a cyclonic storm formed in the Bay of Bengal.
2. It was named by India.

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: The Cyclone Tej in the Arabian Sea is turning into a cyclonic storm. It is expected to turn into a severe cyclonic storm and move towards the south coasts of Oman and adjoining Yemen. **Cyclone Tej was named by India. Hence, statement 1 is not correct**.

98. **Consider the following statements, with reference to Settlement Guarantee Fund (SGF):**
1. A Settlement Guarantee Fund (SGF) is a corpus used for settlement of trades during defaults.
2. All intermediaries such as stock exchanges, clearing corporations and brokers contribute towards SGF.
3. SGF is received only in the form of securities.

How many of the above statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Recently Settlement Guarantee Fund (SGF) has regulated norms for the Settlement Guarantee Fund in the commodity derivatives segment. **The primary objective of SGF is to have a fund for each segment to guarantee the settlement of trades executed in the respective segment of the stock exchange**. A Settlement Guarantee Fund (SGF) is a corpus used for settlement of trades during defaults. **Hence, statement 1 is correct.**

All intermediaries such as **stock exchanges, clearing corporations and brokers contribute towards SGF**. **Hence, statement 2 is correct.**

SGF is received in the form of cash and securities. **Members are required to maintain a minimum of 10% of their Securities Segment margin requirements in the form of cash contributions to SGF**. Members have the option to maintain their entire SGF contribution in the form of Cash. The SEBI has recently notified that excess contribution may be returned to the contributing stakeholders on a pro-rata basis, after taking due approval from SEBI. **Hence, statement 3 is not correct.**

99. **Indian Army's recent initiative to promote indigenous military knowledge by merging ancient strategic insights with modern military practices, is named:**
(a) Project Udbhav
(b) Project Avishkar
(c) Project Shakti
(d) Project Chanakya

Answer: (A)
Explanation: The effort the integrate **India's "ancient strategic acumen"** into the contemporary military domain and **develop an "indigenous strategic vocabulary", rooted in India's "philosophy and culture"** was launched under 'Project Udbhav of the Indian Army. **Hence, option (a) is correct.**

100. **Consider the following statements, with reference to Agni-D:**
1. It is an AI-based surveillance software system developed by DRDO.
2. It is deployed in the Radcliffe line along the India-Pakistan border.

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: The army's forward posts in the northern sector have started testing an artificial intelligence (AI) based software Agni-D for surveillance and thwarting transgressions**. Agni-D is a defence software that has been developed by Captain Vikas Tripathi,** an electrical engineer with the army. **The software system was showcased by Aero India.** Agni-D has been tested in internal camps and during army exercises over the last few months. **Agni-D is a coded system that aims to automate surveillance centres and outposts**. The

system can recognize heat signatures of various types, including weapons, tanks, armoured vehicles and missiles captured by surveillance cameras. It can also prove to be vital for security proposes of static formations of forces at peace stations across the country. **Agni-D is deployed in the eastern Ladakh sector,** a region of strategic importance due to its closeness to China. **Hence, both statements are not correct.**

101. **Consider the following statements, with reference to Pradhan Mantri Anusuchit Jaati Abhuyday Yojana:**
1. It is a merged scheme of 3 Centrally Sponsored Scheme that aims to reduce poverty of the Schedule Caste (SC) communities.
2. Adarsh Gram is one of the components of the yojana.
3. The scheme functions under the aegis of the Ministry of Social Justice and Empowerment.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: Pradhan Mantri Anusuchit Jaati Abhuyday Yojana (PM- AJAY) is a merged scheme of 3 Centrally Sponsored Scheme such as:

- **Pradhan Mantri Adarsh Gram Yojana (PMAGY) –** Aims at integrated development of Scheduled Castes majority villages.
- **Special Central Assistance to Scheduled Castes Sub Plan (SCA to SCSP)** – Provides 100% grant to the States/UTs as an additive to their Scheduled Castes Sub Plan (SCSP).
- **Babu Jagjivan Ram Chhatrawas Yojana (BJRCY) –** Construction of hostels for students belonging to Scheduled Castes (SC).

PM- AJAY aims to reduce poverty in the SC communities by the generation of additional employment opportunities **through Skill development, income-generating schemes and other initiatives**. It aids in improving socio-economic developmental indicators by ensuring adequate infrastructure and requisite services in the SC-dominated villages**. The 3 components of PM-AJAY are:**

- Development of **SC-dominated villages into an "Adarsh Gram".**
- Grants-in-aid to State/Districts.
- Construction/Repair of Hostels.

The objective of Adarsh Gram is **to ensure the integrated development of SC-majority villages**. All requisite infrastructure necessary for socio-economic development needs are to be provided under the Scheme. The scheme functions under the aegis of the Ministry of Social Justice and Empowerment. **Hence, all statements are correct.**

102. **Consider the following statements, with reference to the Visa Shopping:**
1. It is the practice of applying for a visa in a country where it is faster or easier to get as compared to the original destination.
2. Schengen Visa is a type of visa shopping that facilitates free movement for travellers between India and Nepal.

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)
The practice of 'visa shopping' has been gaining popularity in recent times in several Indian states which may have legal implications if travellers do not adhere to the norms and guidelines of the visa process. **Visa shopping is the practice of applying for a visa from a country where it is faster or easier to get as compared to the main or original destination. Hence, statement 1 is correct.** Schengen Visa is a type of visa shopping that facilitates free movement for travellers Schengen region in Europe. **The Schengen system was established in 1985**. Under it, member countries form the Schengen area and people can travel freely between them without going through border controls. Once a Schengen visa is granted, travellers can traverse the Schengen region and reach their intended destination. **Schengen Visa is the most sought-after visa in Visa Shopping. Hence, statement 2 is not correct.**

103. **'Cyclone Hamoon' is formed in which of the following regions?**
(a) Bay of Bengal
(b) Arabian Sea
(c) Red Sea
(d) Mediterranean Sea

Answer: (A)
Explanation: 'Cyclone Hamoon' formed in the Bay of Bengal has recently intensified into a severe cyclonic storm that is likely to reach a very severe category. The cyclonic storm "Hamoon" that has formed over the Bay of Bengal has rapidly intensified into a severe cyclonic storm. Hamoon was a Deep Depression before intensifying into a Cyclonic Storm. **Hence, option (a) is correct.**

104. **With reference to the Multilateral Development Banks (MDBs), consider the following statements:**
1. They are international organizations made up of both developed and developing nations.
2. Developed countries make contributions to MDB lending while developing countries borrow from them for development initiatives.

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: MDBs are international institutions comprising developed and developing countries. They offer financing and technical assistance for various projects in areas like transportation, energy, urban infrastructure, and waste management. Developed countries contribute to MDB lending while developing nations typically borrow from them for development projects. MDBs have been instrumental in supporting the development of both low-income and middle-income countries (LICs and MICs) by addressing issues such as poverty reduction, infrastructure development, human capital formation, etc. **MDBs include the World Bank Group, the Asian Development Bank, the African Development Bank, the Inter-American Development Bank, etc. Hence, both statements are correct.**

105. **Consider the following statements regarding Best Tourism Village:**
1. Dhordo village of Rajasthan has been conferred the prestigious title of Best Tourism Village 2023.
2. The award is given by the United Nations World Tourism Organisation (UNWTO).

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: Dhordo village in Gujarat made it to the UN World Tourism Organisation's (UNWTO) best villages list for its rich cultural heritage and natural beauty. Dhordo village is nestled in the Great Rann of Kutch in Gujarat which hosts the annual cultural festival Rann Utsav which showcases the region's traditional art, music, and crafts. **It also hosted the 1st Tourism Working Group Meeting of the G-20 held under India's presidency in 2023**. **Hence, statement 1 is not correct.**

A global initiative to highlight those villages where tourism preserves cultures and traditions celebrates diversity, provides opportunities and safeguards biodiversity. **The award is given by the United Nations World Tourism Organisation (UNWTO). Hence, statement 2 is correct.**

106. **Consider the following statements, with reference to the 'Loss and Damage' Fund:**
1. It is a financing mechanism to compensate the most vulnerable countries for climate-linked disasters.
2. It was established in the CoP-27 conference held in Sharm el-Sheikh, Egypt.
3. The fund is managed by the World Bank.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: A few countries involved in a committee tasked with designing a "loss and damage" have recently agreed to meet in November before COP 28 to address the issues with the fund. **Loss and Damage Fund (L&D fund) is a financing mechanism to compensate the most vulnerable countries from climate-linked disasters**. Loss and Damage refer to impacts of climate change that cannot be avoided either by mitigation or adaptation. **Hence, statement 1 is correct.**
In the 1990s, the Alliance of Small Island States began calling for the establishment of a loss and damage fund**. The G-77 (India is part of the group) and China had called for the immediate creation of an L&D fund at COP 27 which was agreed upon. Hence, statement 2 is not correct.**
The fund will initially draw on contributions from developed countries and other private and public sources with an option for other major economies to join down the line. The fund will aid developing countries that are vulnerable to the adverse effects of climate change. **The middle-income countries that are severely affected by climate disasters are also eligible. The COP is yet to finalize the authority to oversee the Loss and Damage Fund.** There is still no clear affirmation on which entity should oversee the fund, who should pay and which countries would be eligible to receive funding. **Hence, statement 3 is not correct.**

107. **Consider the following statements, with reference to the Dust Suppressants:**
1. Dust suppressants are salts of calcium or magnesium that can absorb moisture.

2. The use of dust suppressant along with water is relatively more effective in control of pollution than conventional methods of dust control.

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)
Dust suppressants are salts of calcium or magnesium that can absorb moisture. Magnesium chloride absorbs moisture. **The use of dust suppressants along with water is relatively more effective in control of pollution than conventional methods of dust control that as plain water spraying**. The use of dust suppressants in water can be more effective than plain water sprinkling as it shows more efficiency in reducing particulate matter emissions. About 30% reduction in dust concentration (PM10, PM2.5 and PM1) was observed up to 6 hours for construction sites as well as roads with the use of dust suppressant. T**his is not the first time it has been used in the Capital and parts of NCR to reduce the Delhi pollution.** In 2019, the Delhi Pollution Control Committee also issued directions that all construction agencies use dust suppressants to control dust emissions and road-owning agencies. **The effort by the Delhi government aids the Graded Response Action Plan (GRAP) and seeks to improve the Air Quality Index**. **Hence, both statements are correct.**

108. **The Rafah border, recently seen in the news. It connects:**
(a) Gaza Strip and Israel
(b) Gaza Strip and the Mediterranean Sea
(c) Israel and Egypt
(d) Gaza Strip and Egypt

Answer: (D)
Explanation: After Israel imposed a complete siege of the Gaza Strip in response to the deadly attack by Hamas, the strip's border crossing with Egypt became even more critical. **The Rafah border is the only point not controlled by Israel where civilians can enter and leave Gaza by land. The border connects the Gaza Strip and Egypt**. The demand to open it has grown as Israel prepares for a possible ground invasion of Gaza and living conditions in the Gaza Strip have worsened dramatically in the face of heavy Israeli bombings, some of which have also damaged the border. **Restrictions on the movement of persons and products to and from Gaza enforced by both Israel and Egypt have harmed Palestinians' living circumstances in the Gaza Strip**. Both Israel and Egypt have made entry from Gaza contingent on acquiring permission from one of their respective governments. **Hence, option (d) is correct.**

109. **Consider the following statements regarding the Subscriber Identification Module (SIM) card:**
1. A SIM card is an integrated circuit or a microchip that identifies the subscriber on a given network.
2. eSIMs are environment-friendly and can be programmed by subscribers themselves.
3. These are built in accordance with International Electrotechnical Commission specifications.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: A SIM card is an integrated circuit or a microchip that identifies the subscriber on a given network. In order for a mobile phone to connect to any cellular network that follows the Global System for Mobile Communications (GSM) standard, a SIM card is mandatory. **Until 2G networks, the term 'SIM card' denoted both the hardware and the corresponding software. This changed with the advent of the Universal Mobile Telecommunications System with 3G networks. In the 3G network the 'SIM' became only the software, the hardware was called the Universal Integrated Circuit Card (UICC).** The software was also upgraded to an application called Universal SIM or USIM. USIM could be modified to be compatible with the identification and security requirements of 3G, 4G, and 5G networks. UICC loaded with both SIM and USIM applications can work with networks of all generations. **Over the years, the SIM card has shrunk from the SIM to the mini SIM to the micro SIM to the nano SIM and the latest on this path is the eSIM**. In eSIM the SIM software is loaded to a UICC that is permanently installed in the mobile equipment in the factory itself and it cannot be removed which is called eUICC. **It is environmentally friendly and there is no need for more plastic and metal for a new SIM.** A malicious person won't be able to separately access the SIM application or duplicate it. eSIMs can be programmed by subscribers themselves. eSIM can in theory allow network operators to track subscribers' data, including inside apps on the device, especially in the absence of data privacy laws. T**he International Organization for Standardisation and the International Electrotechnical Commission maintain the ISO/IEC 7816 international standard for SIM cards. Hence, all statements are correct.**

110. **Consider the following statements, with reference to the 'Gaganyaan mission':**

1. The Gaganyaan mission will use the Geosynchronous Satellite Launch Vehicle Mk III (GSLV Mk III), also known as the Launch Vehicle Mark-III (LVM-3).
2. The Gaganyaan Mission's Orbital Module (OM), which will orbit the Earth, will include the Crew Module (CM) and Service Module (SM).

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: Geosynchronous Satellite Launch Vehicle Mk III (GSLV Mk III), also known as Launch Vehicle MarkIII (LVM-3), will be used as a launch vehicle in the Gaganyaan mission. **The Central Hub of the Gaganyaan Mission, Orbital Module (OM), which will orbit the Earth, will comprise a Crew Module (CM) and Service Module (SM).** The Crew Module will have an Earth-like environment in space for the crew. **Hence, both statements are correct.**

111. **Consider the following statements, with reference to Regional Connectivity Scheme (RCS) – UDAN:**
1. The scheme aims to improve infrastructure and connectivity in India, especially in remote and underserved regions.
2. It is a component of India's National Civil Aviation Policy (NCAP), 2016.
3. UDAN 5.1 is designed specifically for helicopter routes by increasing the scope of operations for helicopter operators.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The Regional Connectivity Scheme (RCS) - UDAN (Ude Desh Ka Aam Nagrik) has recently completed 6 years with a total of 75 airports and 499 UDAN routes being operationalized under UDAN. **The Regional Connectivity Scheme (RCS) – UDAN aims to improve infrastructure and connectivity in India, especially in remote and underserved regions. It is a vital component of India's National Civil Aviation Policy (NCAP) 2016, launched by the Ministry of Civil Aviation (MoCA) with a 10-year vision**. The first RCS-UDAN flight was inaugurated by the Hon'ble Prime Minister in 2017, connecting Shimla to Delhi. The scheme focuses on improving unserved air routes in underserved regions of the country and fulfilling the aspirations of the common citizens. **UDAN 5.1 – designed specifically for helicopter routes by increasing the scope of operations for helicopter operators, enhancing viability gap funding (VGF) and reducing Airfare Caps. UDAN 5.2 – is underway to further enhance the connectivity to remote and regional areas of the country, and achieve last-mile connectivity**. The scheme will provide greater operational flexibility to the small aircraft operators. **Hence, all statements are correct.**

112. **Consider the following statements, with reference to the Automated Permanent Academic Account Registry (APAAR):**
1. APAAR is envisioned as a compulsory student ID for all students in India, starting from childhood.
2. It was launched as a part of the National Education Policy, 2020 by the Ministry of Education.

Which of the above statements is correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (B)
Explanation: Recently several state governments requested schools to seek parental consent for the creation of the Automated Permanent Academic Account Registry (APAAR), a new student identity card. APAAR is envisioned as a special ID system for all students in India, starting from childhood. **The main objective of the APAAR is to make education hassle-free and reduce the need for students to carry physical documents. It would also serve as a gateway to Digilocke**r, a digital system where students can store their important documents and achievements. **It also aims to reduce fraud and duplicate educational certificates by providing a single, trusted reference for educational institutions.** Every individual will have a unique APAAR ID, which will be linked to the Academic Bank Credit (ABC). Academic Bank Credit (ABC) is a digital storehouse that contains information on the credits earned by students throughout their learning journey. **With the APAAR ID, students would be able to store all their certificates and credits, whether they come from formal education or informal learning.** To sign up for APAAR, students will have to provide basic information such as name, age, date of birth, gender, and a photograph. This information will be verified using their Aadhar number. **The 'One Nation, One Student ID' initiative was launched as part of the National Education Policy 2020 by the Education Ministry**. **Hence, statement 1 is not correct.**

113. **Consider the following statements, with reference to the Indian peafowl:**

1. It is regarded as the national bird which is under Schedule I of the Wildlife Protection Act.
2. The IUCN status of the Indian peafowl is Least Concern.
3. The population of peafowls has increased exponentially across Tamil Nadu in the last 5 to 10 years.

How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: Indian peafowl are a species in a group of birds called pheasants. The males are called peacocks, while the females are called peahens. Together, they are peafowl. **The Indian peafowl (Pavo cristatus) is a brightly-coloured bird that lives mainly on the ground. Peafowl are among the largest of all birds that fly such as ostriches and emus. It is regarded as the national bird and is listed under Schedule I of the Wildlife Protection Amendment Act, 2022. The IUCN status of the Indian peafowl is Least Concern**. It can be found in forests, forest edges and agricultural land. Its presence in forest areas often indicates the presence of a predator such as a tiger. Indian peafowl are native to India and Sri Lanka in South Asia. The recent research by the Salim Ali Centre for Ornithology (SACON) in Coimbatore suggests that the population of peafowls has increased exponentially across Tamil Nadu in the last 5 to 10 years. **One of the reasons for the proliferation of peafowls is due to a drop in the number of predators such as jackals. Another could be due to the rising temperatures due to climate change and subsequent increases in dry areas**, which are preferred by the birds. **Hence, all statements are correct.**

114. **Consider the following statements regarding Reference fuels:**
1. It is a high-value product used for vehicle calibration and testing.
2. India is the world's greatest producer of reference fuels.

Which of the above statements is correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (A)
Explanation: Reference fuels (Gasoline and Diesel) are high-value premium goods used for vehicle calibration and testing by automakers and organizations involved in testing and certification in the automobile industry. **For the first time in India, Indian Oil has successfully begun the manufacture of Reference Gasoline and Diesel Fuels**. **Hence, statement 1 is correct.**
Currently, India imports these reference fuels from a few European and American corporations. **Hence, statement 2 is not correct.**

115. **In regard to economic policies, the phrase Bidenomics appeared sometimes in the news. Which of the following statements best expresses its meaning?**
(a) It is a collection of policies that focuses on tax cuts, deregulation, domestic spending cuts, and inflation control.
(b) It is a collection of policies that prioritize relief measures, infrastructure improvements, and expanding the safety net, with higher-income individuals and corporations paying more in taxes.
(c) It is a combination of policies that stresses trade protectionism, immigration restrictions, and global isolationism.
(d) It is a collection of policies based on a global wealth tax that prioritizes environmental sustainability, social fairness, and human rights.

Answer: (B)
Explanation: Bidenomics is a wordplay on Reaganomics, the nickname for the Reagan administration's economic policies, which emphasized four pillars: **tax cuts, deregulation, domestic spending cuts and inflation reduction**. Bidenomics, according to the White House, is a **rejection of the trickle-down economic policies that defined Reaganomics**. It is a vision centred around three key pillars: **making smart public investments; empowering and educating workers to grow the middle class; and promoting competition to lower costs and help entrepreneurs and small businesses thrive. Hence, option (b) is correct.**

116. **Consider the following statements, with reference to the United Nations Forum on Forests (UNFF):**
1. It is a subsidiary body that promotes the management, conservation and sustainable development of all types of forests.
2. India is a founding member of the forum which was established in the year 2000.

Which of the above statements is correct?
(a) 1 Only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (C)
Explanation: The United Nations Forum on Forests promotes the management, conservation and sustainable development of all types of forests. **Its main objective is to promote the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment**. UNFF is a subsidiary body that was established by the Economic and Social Council of the United Nations (ECOSOC) in October 2000. The Forum has universal membership and is composed of all Member States of the United Nations and specialized agencies. **India is a founding member of the forum. The Ministry of Environment, Forest and Climate Change is organising a Country-Led Initiative (CLI) event as part of the United Nations Forum on Forests (UNFF). Hence, both statements are correct.**

117. **Consider the following statements, with reference to Hanle Dark Sky Reserve (HDSR):**
1. HDSR aims to control man-made light pollution in the area in order to preserve the pristine dark skies for astronomical research.
2. It is an Indian astronomical observatory that is located in the South Pole of Antarctica.
3. The Bortle scale is a 9-level numeric scale that measures the brightness of a telescope.

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 1st official star party for experienced amateur astronomers was organised by the Indian Institute of Astrophysics (IIA) at Hanle Dark Sky Reserve in eastern Ladakh. **HDSR aims to control man-made light pollution in the area in order to preserve the pristine dark skies for astronomical research**. A dark sky is the night sky as nature meant for it to be, without any light pollution. The Reserve is promoted as a tourist destination for enjoying the night sky and also helps in the socio-economic development of the local villages. **Hence, statement 1 is correct.**
HDSR is India's first dark sky region which is centred at Hanle in Eastern Ladakh, around the Indian Astronomical Observatory. It is India's first Night Sky Sanctuary is located within the Changthang Wildlife Sanctuary. **Hence, statement 2 is not correct.**
The Bortle scale is a 9-level numeric scale that measures the night sky's brightness in a particular location**. The scale ranges from Class 1, the darkest skies available over the earth, through to Class 9,** which denotes the pale, light-marred skies over the insides of cities. HDSR region falls under the Bortle Class 1. **Hence, statement 3 is not correct.**

118. **"25 by 25 target" is an initiative of which of the following?**
(a) Ministry of Health and Family Welfare
(b) United Nations Framework Convention on Climate Change (UNFCCC)
(c) World Health Organization (WHO)
(d) The Ministry of Environment, Forest and Climate Change

Answer: (C)
Explanation: Recent analysis by the Indian Council of Medical Research (ICMR) indicates that India is likely to miss the target set by the World Health Organisation in its 25 by 25 target. **"25 by 25 target" is an initiative of the World Health Organisation (WHO) to reduce by 25% premature mortality from non-communicable diseases (NCDs) compared to 2010 by 2025.** It was adopted by the World Health Assembly in May 2012. The framework is expected to drive progress in the prevention and control of NCDs. It **provides the foundation for advocacy, raising awareness, reinforcing political commitment** and promoting global action to tackle these deadly diseases. **Hence, option (c) is correct.**

119. **Consider the following statements, with reference to Atlantic Meridional Overturning Current (AMOC):**
1. It is a global conveyor belt that circulates water within the Atlantic Ocean by bringing warm water north and cold water south.
2. AMOC circulation brings warmth to various parts of the globe and also carries nutrients necessary to sustain ocean life.

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 recently published "2023 State of the Climate Report: Entering uncharted territory" indicates that AMOC may cross the tipping point and start to collapse between 2025 and 2095. **The Atlantic Meridional Overturning Circulation (AMOC) is a system of ocean currents that circulates water within the Atlantic Ocean by bringing warm water north and**

cold water south. The slower currents that occur from the surface to the seafloor are driven by changes in the saltiness and ocean temperature is a process called thermohaline circulation. **These currents are carried in a large "global conveyor belt," which includes the AMOC**. AMOC circulation brings warmth to various parts of the globe and also carries nutrients necessary to sustain ocean life. The **circulation process begins as warm water near the equator moves toward the poles (such as the Gulf Stream in the North Atlantic),** where it cools and forms sea ice. **Hence, both statements are correct.**

120. **With reference to the East Coast Economic Corridor (ECEC), consider the following statements:**
1. The Eastern Coast Economic Corridor (ECEC) is India's first coastal economic corridor.
2. It runs from Kolkata (West Bengal) to Kanyakumari (Tamil Nadu) in the north to the south.
3. The New Development Bank granted a loan to cover the corridor's construction.

How many of the statements given above are correct?

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

Answer: (B)
Explanation: The East Coast Economic Corridor (ECEC) is India's first coastal economic corridor along the eastern coast. **Hence, statement 1 is correct. ECEC also aligns with port-led industrialisation under the Sagarmala initiative and Act East Policy** by linking domestic companies with vibrant global production networks in East and Southeast Asia. It **stretches about 2,500 km from Kolkata (West Bengal) in the north to Kanyakumari (Tamil Nadu) in the south**. **Hence, statement 2 is correct.** It will connect the long eastern coastline and strategically located ports with multiple international gateways to connect India with global value chains (GVCs) in East and Southeast Asia. **The construction of this corridor is funded by the Asian Development Bank (ADB) by approval of a loan**. **Hence, statement 3 is not correct.**

Practice MCQs on Conventional Subjects – October 2023

1. **Match the following environmental treaties with their focus areas:**

Treaty	Focus Area
1. Kyoto Protocol	Climate change mitigation
2. Basel Convention	Hazardous waste management
3. Ramsar Convention	Wetland conservation

How many of the above pairs are correctly matched?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation:
· The Kyoto Protocol is an international treaty that focuses on addressing climate change**. Its primary objective is to reduce greenhouse gas emissions and combat global warming**. **Hence, pair 1 is correctly matched.**
· The **Basel Convention is an international treaty that aims to control the transboundary movement and disposal of hazardous waste. It** promotes environmentally sound management of hazardous wastes to minimize their adverse impacts on human health and the environment. **Hence, pair 2 is correctly matched.**
· The **Ramsar Convention is an international treaty that emphasizes the conservation and sustainable use of wetlands.** It recognizes the ecological value of wetlands and promotes their wise use, with the goal of maintaining their ecological functions and biodiversity. **Hence, pair 3 is correctly matched.**
Hence, option (c) is the correct answer.

2. **What is the focus of Agenda 21, which emerged from the Earth Summit conference?**
(a) Climate change and global warming
(b) Protection of biological diversity
(c) Sustainable development in the 21st century
(d) Forest conservation and management

Answer: (C)
Explanation:
· **Agenda 21 is an 800-page non-binding action program that serves as a guide for all nations into the 21st century.** It covers various key topics, including energy conservation, climate change, pollution, water resource protection, soil loss, deforestation, radioactive waste, and disparities of wealth and poverty.
· **The climate change and global warming are addressed through a separate Climate Change Framework agreement.** The protection of biological diversity is addressed through a separate Biological Diversity agreement.
Hence, option (c) is the correct answer.

3. **Consider the following statements:**
1. Anshi National Park is located near the city of Dandeli in the Uttara Kannada District of Karnataka along the border of Goa.
2. The vegetation in Anshi National Park primarily consists of evergreen forests.

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 Anshi National Park is located near the city of Dandeli in the Uttara Kannada District of Karnataka along the border of Goa.** This Park is a habitat for Bengal tigers, black panthers and elephants. **Hence, statement 1 is correct.**
· **The Anshi National Park has moist deciduous forests, not evergreen forests**. The species of flora found in the park include true cinnamon, bamboo, bauhinia, eucalyptus, silver oak, teak, and Jamba, but there is no mention of evergreen forests. **Hence, statement 2 is incorrect.**
Hence, option (a) is the correct answer.

4. **Consider the following statements:**
1. Estuary is the point at which the mouth of a river enters the sea and freshwater and seawater are mixed.
2. Estuaries are the most productive water bodies in the world as they receive freshwater from river mouths and are washed daily by seawater.

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:
· **Estuaries are indeed the points where the mouth of a river meets the sea, resulting in the mixing of freshwater and seawater.** This mixing creates a unique environment with varying salinity levels. **Hence, statement 1 is correct.**
· Estuaries are highly productive ecosystems due to the combination of freshwater inflow from rivers and the periodic influx of seawater due to tides. **The mixing of nutrients and organic matter from land and sea creates favourable conditions for the growth of diverse plant and animal life,** making estuaries one of the most productive water bodies in the world. **Hence, statement 2 is correct.**
Hence, option (c) is the correct answer.

5. **Match the following terms with their definitions:**

Term	**Definition**
1. Biodegradation	The breakdown of organic substances by living organisms.
2. Biomagnification	The accumulation of toxins in the food chain.
3. Biodiversity hotspots	Regions with a high concentration of endemic species.

How many of the above pairs are correctly matched?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation:
· Biodegradation refers to the natural process by which organic substances, such as **plant matter or waste products, are broken down and decomposed by living organisms, such as bacteria, fungi, or insects.** This process helps recycle nutrients and return them to the environment. **Hence, pair 1 is correct.**
· Biomagnification **refers to the process by which certain substances, such as toxic chemicals or pollutants, become increasingly concentrated in the tissues of organisms as they move up the food chain.** Organisms at higher trophic levels, such as predators, tend to accumulate higher levels of these substances, which can have harmful effects on their health and the health of the ecosystem. **Hence, pair 2 is correct.**
· **Biodiversity hotspots are specific geographic regions that have a high concentration of endemic species, meaning species that are found exclusively in that particular area and nowhere else in the world.** These hotspots are recognized for their exceptional biodiversity and conservation value. **Hence, pair 3 is correct.**
Hence, option (c) is the correct answer.

6. **Consider the following statements regarding the Attorney General for India:**
1. The Attorney General for India is the Government of India's first law officer and has the right of audience in all courts of the country.
2. He is a member of the Union Cabinet.
3. According to the Constitution of India, it shall be the duty of the Attorney-General to perform such duties of a legal character, assigned to him by the President.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:
· The Constitution of India places the post of the A-G on a special footing. **The A-G is the Government of India's first law officer and has the right to be audited in all courts of the country. Hence, statement 1 is correct.**
· **Article 76(2) of the Constitution** says "It shall be the duty of the Attorney-General to give advice to the Government of India upon such legal matters and to perform such other duties of a legal character, as may from time to time be referred or assigned to him by the President". **Hence, statement 3 is correct.**
· The A-G is also supposed to "discharge the functions conferred on him by or under this Constitution or any other law for the time being in force**". Also, the A-G for India is not, like the A-G for England and Wales and the A-G of the United States, a member of the Cabinet. Hence, statement 2 is incorrect.**

7. **Consider the following statements regarding the President's rule that is imposed under Article 356 of the Constitution:**
1. It cannot be imposed without the written recommendation of the Governor of the concerned state.
2. Every proclamation of the President's rule must be approved by both houses of Parliament within a stipulated time.

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: A**rticle 356 empowers the President to issue a proclamation if he is satisfied that a situation has arisen in which the government of a state cannot be carried on in accordance with the provisions of the Constitution.** Notably, the president can act either on a report of the governor of the state or otherwise (ie, even without the governor's report). **A proclamation imposing the President's Rule must be approved by both Houses of Parliament within two months from the date of its issue**. If approved by both the Houses of Parliament, the President's Rule continues for six months. **Hence, statement 1 is incorrect.**

8. **Consider the following statements:**
1. The guidelines for registration of political parties are issued under the Representation of the People Act, 1951.
2. The Election Commission of India (ECI) has statutory power to enforce internal democracy in political parties to remind parties to conduct elections and to ensure that their leadership is renewed, changed or re-elected every five years.

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 ECI has periodically used guidelines issued for the registration of parties under **Section 29A of the Representation of the People Act, 1951** to remind parties to conduct elections and to ensure that their leadership is renewed, changed or re-elected every five years. However, the **commission does not have any statutory power to enforce internal democracy in parties or to mandate elections**. **Hence, statement 2 is incorrect.**

9. **A federal government means a government in which:**
(a) There is a division of powers between the Central and state governments; and also between the federal and state judiciaries.
(b) All the powers are vested in the national government and the regional governments derive their authority from the national government.
(c) A large number of powers are vested in the national government and the regional governments, with some independent powers, derive their authority from the national government.
(d) Powers are divided between the national government and the regional governments by the Constitution and both operate in their respective jurisdictions independently.

Answer: (D)
Explanation: A federal government is one in which **powers are divided between the national government and the regional governments by the Constitution it and both operate in their respective jurisdictions independently**. In a federal model, the national government is known as the Federal government the Central government or the Union government and the regional government is known as the state government or the provincial government. **Hence, option (d) is correct.**

10. **Consider the following statements:**
1. According to Article 200 of the Constitution of India, the Governor can reserve a bill for the consideration of the President only if the Governor forms an opinion that the Bill would endanger the position of the High Court.
2. The Constitution of India does not mention the grounds on which a Governor may withhold his assent to a Bill.

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: Article 200 of the Constitution provides certain options for the Governor to exercise when a Bill reaches him from the Assembly. **The provision concerned makes it clear that a Bill can be reserved for the consideration of the President only if the Governor forms an opinion that the Bill would endanger the position of the High Court by whittling away its powers.** The Constitution does not mention any other type of Bill which is required to be reserved for the consideration of the President. The fact that the Constitution does not mention the grounds on which a Governor may withhold assent to a Bill shows that this power should be exercised by the Governor extremely sparingly and after very careful consideration of the consequences of such action. **Hence, both statements are correct.**

11. **Consider the following statements regarding the Sea floor:**
1. Volcanic eruptions are common along the mid-oceanic ridges.
2. The age of the rocks decreases as one moves away from the crest.
3. The ocean crust rocks are much younger than the continental rocks.

How many of the above statements is/are correct?
(a) Only one

(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Sea floor spreading is verified using these phenomena:
1. Hence, it was realised that all along the mid-oceanic ridges, **volcanic eruptions are common and they bring huge amounts of lava to the surface in this area**. The sediments on the ocean floor are unexpectedly very thin.
2. The age of the rocks increases as one moves away from the crest.
3. The ocean crust rocks are much younger than the continental rocks.
4. The sediments on the ocean floor are unexpectedly very thin.
5. The deep trenches have deep-seated earthquake occurrences while in the mid-oceanic ridge areas, **the quake foci have shallow depths.**
Hence, statement 2 is incorrect.

12. **Consider the following statements regarding Thermosphere:**
1. In the thermosphere temperature decreases very rapidly with increasing height.
2. Radio waves transmitted from the earth are reflected back to the earth by this layer.
3. The space shuttle and the International Space Station both orbit Earth within the thermosphere.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The thermosphere is a layer of Earth's atmosphere. **The thermosphere is directly above the mesosphere and below the exosphere. It extends from about 90 km to between 500 and 1,000 km above our planet**. This layer **helps in radio transmission**. In fact, radio waves transmitted from the earth are reflected back to the earth by this layer. **The space shuttle and the International Space Station both orbit Earth within the thermosphere.** This is also where you'll find low-Earth orbit satellites. It is **called the thermosphere because temperatures can reach up to 1,500 degrees Celsius.** However, despite the high temperatures, the pressure is very low, so satellites don't suffer heat damage. **Hence, statement 1 is incorrect.**

13. **Which of the following are the conditions for the emergence of a tropical cyclone?**
1. Unstable condition through the Troposphere
2. Strong Coriolis force
3. Strong vertical wind wedge
4. Large and continuous supply of warm and moist air

Select the correct answer using the code given below:
(a) 1, 2 and 3
(b) 2, 3 and 4
(c) 1, 2 and 4
(d) All of the above

Answer: (C)
Explanation: Some initial conditions for the emergence of a tropical cyclone are:
i. Large and continuous supply of warm and moist air that can release enormous latent heat.
ii. **Strong Coriolis force that can prevent the filling of low pressure at the centre** (absence of Coriolis force near the equator prohibits the formation of tropical cyclones between 0°-5° latitude).
iii. Unstable condition through the troposphere that creates local disturbances around which a cyclone develops.
iv. Finally, the **absence of a strong vertical wind wedge**, disturbs the vertical transport of latent heat.

14. **Which of these drainage patterns is formed when streams flow in different directions from a central peak or dome-like structure?**
(a) Dendritic
(b) Radial
(c) Rectangular
(d) Trellis

Answer: (B)
Explanation: The Dendritic pattern develops where **the river channel follows the slope of the terrain**. **The stream with its tributaries resembles the branches of a tree, thus the name dendritic.** A river joined by its tributaries, at approximately right angles, develops a trellis pattern. **A trellis drainage pattern develops where hard and soft rocks exist parallel to each other**. A rectangular drainage pattern develops on a strongly jointed rocky terrain. The radial pattern develops when streams flow in different directions from a central peak or dome-like Structure. **Hence, option (b) is correct.**

15. **Most of the world's deserts are located in the western margins of continents in the subtropics. This is because:**
1. The tropical easterly winds become dry by the time they reach the western margins of the continents.
2. Presence of warm ocean currents along the western shores of continents.

Select the correct answer using the code given below:
(a) 1 only

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

Answer: (A)
Explanation: The **prevailing winds in the tropics are tropical easterly winds**. The tropical easterly winds become dry by the time they reach the western margins of the continents and so they bring no rainfall. Thus, the region becomes devoid of moisture which causes dry conditions leading to the formation of deserts. **The presence of cold ocean currents along the western shores of continents leads to the development of high pressure over the water surface. Hence, statement 1 is correct.**

16. **Consider the following statements regarding GDP Deflator:**
1. It shows the increase in the value of GDP due to an increase in inflation between the periods rather than an increase in output.
2. The GDP deflator contains only those goods and services that households purchase for consumption.

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 GDP Deflator is the ratio of the GDP at current prices to that of the constant **prices. It is derived by using the following formula—GDP Deflator = GDP at Current Prices ÷ GDP at Constant Prices * 100.** This ratio helps show the extent to which the increase in the gross domestic product has happened on account of higher prices rather than an increase in output. **This is why it is used as a measure of inflation (also known as an 'implicit price deflator').**
In the case of India, **while services are not included in the wholesale price index (WPI), the consumer price index (CPI) contains only those goods and services that households purchase for consumption** (such as food, clothing, health, education, etc.) and misses several other goods and services (such as intermediate goods, services required by firms, etc.).
Hence, statement 1 is correct.

17. **Consider the following statements:**
1. The Monetary Policy Committee (MPC) has six members including the RBI Governor, where each member is nominated by the RBI.
2. The Monetary Policy Committee meets every two months to evaluate the current status and outlook for inflation and economic growth.
3. When the Monetary Policy Committee wants to contain inflation, it follows "dear money" policy.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The MPC has six members including the RBI Governor — three each nominated by the RBI and the government. The MPC meets every two months to evaluate the current status and outlook for inflation and economic growth. **Based on that assessment, it tweaks the repo rate, which is the interest rate at which the RBI loans money to the banking system.** It is for this reason that movements in the repo rate influence the overall interest rates in the economy.
Typically, when the MPC wants to contain inflation, it raises the repo rate. Such a "dear money" policy makes all types of borrowing — both for consumers (say, car loans) and producers (say, fresh business investments) — costlier and effectively slows down economic activity in the economy. When the inflation outlook is benign but growth is stalling, the RBI can choose to lower the repo rate and promote economic activity; such a "cheap money" policy incentivises people to spend money instead of saving it. **Hence, statement 1 is incorrect.**

18. **Which of the following factors can lead to a cyclical slowdown in the Indian Economy?**
1. Over-investment in capital assets and in inventory.
2. The production of final goods is not absorbed leading to lower prices and lower economic activity.
3. Changing demographics and changes in consumer behaviour.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Typically, a **cyclical slowdown is caused by an excess of investment demand—over-investment in capital assets (residential and non-residential) and in inventory**. The production of final goods generated by excess investment is not absorbed, leading to inventory reduction, lower prices, lower economic activity, and some loss in employment. When this is accompanied by excess debt, the cyclical slowdown can be prolonged or it may become structural.

A structural slowdown, on the other hand, is a more deep-rooted phenomenon that occurs due to a one-off shift from an existing paradigm. The changes, which last over a long term, are driven by disruptive technologies, changing demographics, and/or changes in consumer behaviour.

19. **Stressed Assets are a powerful indicator of the health of the banking system. It includes:**
1. Non-performing Assets
2. Restructured Loans
3. Written off Assets

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: The most important scale of asset quality is Non-Performing Assets (NPA). But NPA alone doesn't tell the whole story of the bad asset quality of loans given by banks**. Hence a new classification is made in the form of stressed assets that comprises restructured loans and written-off assets besides NPAs.**
Restructured assets or loans are that assets have an extended repayment period, reduced interest rate, converting a part of the loan into equity, providing additional financing, or some combination of these measures.
Written-off assets are those the bank or lender doesn't count the money the borrower owes to it. The financial statement of the bank will indicate that the written-off loans are compensated in some other way.
Hence, all are correct.

20. **The term 'Kostak rate' sometimes seen in the news, is related to:**
(a) Money Market
(b) Minimum Support Price (MSP)
(c) Initial Public Offer (IPO)
(d) Gross Domestic Product

Answer: (C)
Explanation: It **relates to an IPO application**. So, the rate at which an investor buys an IPO application before the listing is termed the Kostak rate. **Hence, option (c) is correct.**

21. **Consider the following statements:**
1. The place where Chandrayaan-3's lander 'Vikram' made a soft landing has been named 'Shiv Shakti Point'.
2. The place where Chandrayaan-2's lander crashed while landing on the lunar surface has been named 'Tiranga Point'.
3. Chandrayaan-3's lander landed on the surface of the Moon on August 23. This day will be celebrated as 'National Space Day'.

Which of the above statements is/are correct?
(a) 1 only
(b) 2 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (D)
Explanation: The place where Chandrayaan-3's lander 'Vikram' made a soft landing has been named **'Shiv Shakti Point'.** The place where the **Chandrayaan-2 lander crashed while landing on the lunar surface in 2019 has been named 'Tiranga Point'**. Chandrayaan-3's lander landed on the lunar surface on August 23. This day will be celebrated as 'National Space Day'. **Hence, all the three statements are correct.**

22. **With reference to the use of nanotechnology in the health sector, consider the following statements:**
1. Targeted drug delivery has become possible through nanotechnology.
2. Nanotechnology can make a major contribution to gene therapy.

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: Nanomedicine is helpful in increasing the efficacy of drug delivery and minimizing side effects. Nanomaterials are used in **gene therapy** to deliver genes to cells. **Hence, both the statements are correct.**

23. **In which one of the following contexts is the word "qubit" mentioned?**
(a) Cloud services
(b) Quantum computing
(c) Visible light communication technologies
(d) Wireless communication technologies

Answer: (B)
Explanation: In quantum computing, a **qubit or quantum bit is a basic unit of quantum information**. The quantum version of the classic binary bit is physically realized with two devices. **A qubit is a one- or two-level quantum mechanical system,** one of the simplest quantum systems that exhibit the properties of quantum mechanics.

24. **Consider the following statements:**

1. Ballistic missiles are jet-propelled at subsonic speeds throughout their flight, while cruise missiles are rocket-propelled only in the initial phase of flight.
2. Agni-V is a medium-range supersonic cruise missile, while BrahMos is a solid-fueled intercontinental ballistic missile.

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: Cruise missiles are propelled by jet thrust at subsonic speeds throughout their flight, while ballistic missiles are propelled by rocket thrust only in the initial (boost) phase of flight, after which they follow an arcing trajectory to the target. **Hence, statement 1 is not correct.**
Agni-V is an Indian intercontinental ballistic missile (ICBM) with a range of more than 5,000 km. BrahMos is a universal long-range supersonic cruise missile system that can be launched from land, sea and air. **BrahMos is jointly developed by India's DRDO and Russia's NPOM. Hence, statement 2 is not correct.**

25. **'Wolbachia method' is sometimes mentioned in the context of which one of the following?**
(a) To control the spread of viral diseases caused by mosquitoes
(b) For making packing material from crop residue
(c) To produce biodegradable plastics
(d) To produce biochar by thermochemical conversion of biomass.

Answer: (A)
Explanation: The 'Wolbachia method' is used to control the spread of viral diseases caused by mosquitoes. **When Aedes aegypti mosquitoes carry Wolbachia, the bacteria compete with viruses such as dengue, Zika, chikungunya and yellow fever.** This makes it harder for the virus to reproduce inside mosquitoes and mosquitoes are less likely to spread the virus from one person to another. This means that when **Aedes aegypti mosquitoes carry natural Wolbachia bacteria, transmission of viruses such as dengue, Zika, chikungunya and yellow fever is reduced.**

26. **Consider the following statements regarding the Phosphorus and Phosphorus Cycle:**
1. The phosphorus cycle is largely atmospheric and easily dissolves in water from the air.
2. Phosphorus occurs as a mineral in phosphate rocks and enters the Phosphorus cycle from erosion and mining activities.
3. Phosphorus is responsible for the excessive growth of rooted and free-floating microscopic plants in water bodies.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The **phosphorous cycle is mainly terrestrial**. The main storage for phosphorus is in the earth's crust. On land, **phosphorus is usually found in the form of phosphates**. It occurs in large amounts as a mineral in phosphate rocks and enters the cycle from erosion and mining activities. **By the process of weathering and erosion phosphates enter rivers and streams that transport them to the ocean**. Being an important nutrient, phosphorous promotes eutrophication in lakes. Along with nitrogen-related compounds, it leads to undesirable situations like algal bloom. **Hence, statement 1 is incorrect.**

27. **Why do exotic species pose a threat to an indigenous ecosystem such as in a Lake or an isolated island in the Andamans?**
1. Such species compete with the local or native species for food.
2. They may be predators of local species.
3. Such species may cause diseases in native species.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: E**xotic species introduced to new environments often reset the ecological conditions in that new habitat, threatening the species that exist there; this is the reason that they are also termed invasive species.** Invasive species that are closely related to rare native species have the potential to hybridize with native species; harmful effects of hybridization have led to a decline and even extinction of native species. **Invasive species can change the food web in an ecosystem by destroying or replacing native food sources**. The invasive species may provide little to no food value for wildlife. Lakes and islands are particularly vulnerable to extinction threats from introduced species. **Hence, all are correct.**

28. **Consider the following statements:**
1. Ecotone is the unique functional role or place of a species in an ecosystem.

2. Niche is a zone of junction between two or more diverse ecosystems.

Which of the above statements is/are incorrect?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (C)
Explanation:
· **Ecotone is a zone of junction between two or more diverse ecosystems**. For e.g. the mangrove forests represent an ecotone between marine and terrestrial ecosystems. **Other examples are – grassland, estuary and river banks.**
· **A niche is the unique functional role or place of a species in an ecosystem**. It is a description of all the biological, physical and chemical factors that a species needs to survive, stay healthy and reproduce. **A niche is unique for a species, which means no two species have identical niches. Niche plays an important role in the conservation of organisms.**
Hence, both statements are incorrect.

29. **Consider the following statements regarding ocean acidification:**
1. It largely occurs due to the high absorption of nitrogenous-based acidic compounds.
2. The introduction of seagrasses can reduce the impact of acidification.

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: Ocean acidification refers to **a reduction in the pH of the ocean over an extended period of time, caused primarily by the uptake of carbon dioxide (CO2) from the atmosphere**. Nitrogenous compounds contribute a fraction to ocean acidification. Seagrass has the ability to control ocean acidification. **Hence, statement 1 is incorrect.**

30. **Which of the following are Tropical Grasslands?**
1. Savanna
2. Campos
3. Prairie
4. Llanos
5. Steppe

How many of the above options are correct?
(a) Only two
(b) Only three
(c) Only four
(d) All five

Answer: (B)
Explanation: Grasslands are known by different names in different regions.
Tropical Grasslands are:
1. East Africa- Savanna
2. Brazil- Campos
3. Venezuela- Llanos
Temperate Grasslands are:
1. Argentina- Pampas
2. America- Prairie
3. Africa- Veld
4. Asia- Steppe
5. Australia- Down
Hence, option (b) is correct.

31. **Which of the following are the features of the Apabhramsa School of Painting?**
1. Jainism was the main theme of these paintings.
2. Pointed nose and double chin in human depiction.
3. Absence of animals and birds

How many of the above statements are/correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: This **school traces its origin to Gujarat and Mewar region in Rajasthan.** It was the predominant school of painting in western India from the 11th to 15th century. **The most common themes of these paintings were Jain and in the later period, the Vaishnava School appropriated them too**. The features of the human figures depicted in the paintings are fish-shaped bulging eyes; a pointed nose and a double chin. The animal and bird figurines in the paintings are represented as toys. **The most famous example is of Kalpasutra and the Kalakacharya Katha from the 15th century. Hence, statement 3 is incorrect.**

32. **Consider the following statements regarding Kuchipudi:**
1. It is mentioned in Natya Shastra.
2. As per tradition, the dance must be accompanied by live vocals and not music.
3. It is recognized as an Indian classical dance.

How many of the above statements are/correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Kuchipudi has its roots in the ancient Hindu Sanskrit text of Natya Shastra. Like all major classical dances of India, it was also developed as a religious art linked to travelling bards, temples and spiritual beliefs. **The Kuchipudi style was conceived by Siddhendra Yogi, a talented Vaishnava poet of the 17th century**. It begins with an invocation to Lord Ganesha followed by nritta (non-narrative and abstract dancing); shabdam (narrative dancing) and Natya. **The dance is accompanied by a song which is typically Carnatic music**. The singer is accompanied by musical instruments like mridangam, violin, flute and tambura. It is one of the major Indian classical dances. **Hence, statement 2 is incorrect.**

33. **Consider the following statements:**
1. During the end of the eighteenth century and the early nineteenth century, a class of rich peasants known as jotedars consolidated their position in the villages and acquired vast areas of land.
2. Jotedars were loyal to the zamindars and helped them collect revenue from the ryots.

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: While many zamindars were facing a crisis at the end of the eighteenth century, a group of rich peasants were consolidating their position in the villages. **These classes of rich peasants were known as jotedars**. By the early nineteenth century, jotedars had acquired vast areas of land – sometimes as much as several thousand acres. They controlled local trade as well as moneylending, exercising immense power over the poorer cultivators of the region**. A large part of their land was cultivated through sharecroppers (adhiyars or bargadars) who brought their own ploughs, laboured in the field and handed over half the produce to the jotedars after the harvest.** They fiercely resisted efforts by zamindars to increase the jama of the village, prevented zamindari officials from executing their duties, mobilised ryots who were dependent on them, and deliberately delayed payments of revenue to the zamindar. **The jotedars were the most powerful in North Bengal. In some places they were called haoladars, elsewhere they were known as gantidars or mandals.** Their rise inevitably weakened Zamindari's authority. **Hence, statement 2 is incorrect.**

34. **Arrange the following in the chronological order in which it was signed:**
1. Treaty of Allahabad
2. Treaty of Bassein
3. Treaty of Srirangapatnam

Select the correct answer using the code given below:
(a) 3-1-2
(b) 1-2-3
(c) 1-3-2
(d) 3-2-1

Answer: (C)
Explanation:
· The **Treaty of Allahabad was signed on 12 August 1765, between the Mughal Emperor Shah Alam II, son of the late Emperor Alamgir II, and Robert Clive,** of the East India Company, as a result of the **Battle of Buxar on 22 October 1764.**
· The **Treaty of Seringapatam** was signed on **18 March 1792** at the end of the Third Anglo-Mysore War.
· The **Treaty of Bassein** was a pact signed on **31 December 1802** between the British East India Company and Baji Rao II, the Maratha Peshwa of Pune in India after the Battle of Poona.

35. **Consider the following statements regarding Raja Rammohan Roy and Brahmo Samaj:**
1. Raja Rammohan Roy, the founder of Brahmo Samaj was called the father of the Indian Renaissance.
2. Rammohan Roy translated into Bengali the Vedas and the five Upanishads.
3. Brahmo Samaj aimed to purify Hinduism, preach monotheism and establish a new religion.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:
· Raja Rammohan Roy (1772-1833), often called **the father of the Indian Renaissance and the maker of Modern India.** Rammohan Roy believed in the modern scientific approach and principles of human dignity and social equality.
· **He put his faith in monotheism**. He wrote **Gift to Monotheists (1809)** and translated into Bengali the Vedas and the five Upanishads to prove his conviction that ancient Hindu texts support monotheism.
· Raja Rammohan Roy founded the **Brahmo Sabha in August 1828**; it was later renamed Brahmo Samaj. Rammohan Roy did not want to establish a new religion. He **only wanted to purify Hinduism of the evil practices** which had crept into it. **Hence, statement 3 is incorrect.**

36. **Consider the following statements regarding the President's rule that is imposed under Article 356 of the Constitution:**
1. It cannot be imposed without the written recommendation of the Governor of the concerned state.
2. Every proclamation of President's rule must be approved by both houses of Parliament within a stipulated time.

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:
· **Article 356** empowers the President to issue a proclamation if he is satisfied that a situation has arisen in which the government of a state cannot be carried on in accordance with the provisions of the Constitution. Notably, the president can act either on a report of the governor of the state or otherwise (i.e., even without the governor's report). **Hence, statement 1 is not correct.**
· **A proclamation imposing the President's Rule must be approved by both Houses of Parliament within two months from the date of its issue**. If approved by both the Houses of Parliament, the President's Rule continues for six months. **Hence, statement 2 is correct.**

37. **Which of the Acts passed by the British Parliament introduced an open competition system of selection and recruitment of civil servants in India before independence and a separate legislative wing for the Governor-General?**
(a) Charter Act of 1853
(b) Indian Councils Act of 1861
(c) Indian Councils Act of 1892
(d) Charter Act of 1833

Answer: (A)
Explanation:
· **Charter Act of 1853 introduced an open competition system of selection and recruitment of civil servants.** The covenanted civil service was thus thrown open to the Indians also. **Accordingly, the Macaulay Committee (the Committee on the Indian Civil Service) was appointed in 1854.** (Before this the Charter Act of 1833 attempted to introduce a system of open competition for selection of civil servants and stated that the Indians should not be debarred from holding any place, office or employment under the Company. However, this provision was negated after opposition from the Court of Directors.) **Hence, option (a) is correct.**

38. **Consider the following statements regarding the Speaker Pro Tem:**
1. He is elected by the Lok Sabha from amongst the members of the house.
2. He is responsible for chairing the meetings of the Lok Sabha until the newly elected Speaker becomes acquainted with the Parliamentary procedures.
3. The Speaker Pro Tem has all the powers of the Speaker.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: As provided by the Constitution, the **Speaker of the last Lok Sabha vacates his office immediately before the first meeting of the newly elected Lok Sabha. Therefore, the President appoints a member of the Lok Sabha as the Speaker Pro Tem**. Usually, the seniormost member is selected for this. The Speaker Pro Tem has all the powers of the Speaker. **He presides over the first sitting of the newly elected Lok Sabha**. His main duty is to administer oaths to the new members. He also enables the House to elect the new Speaker. When the new Speaker is elected by the House, the office of the Speaker Pro Tem ceases to exist. Hence, this office is a temporary office, existing for a few days. **Hence, only statement 3 is correct.**

39. **Which of the following Parliamentary committees does not witness any participation from the Rajya Sabha?**
(a) Public Accounts Committee
(b) Committee on Empowerment of Women
(c) Committee of Privileges
(d) Estimates Committee

Answer: (D)
Explanation: Estimates Committee: The Rajya Sabha has no representation in this committee. These members are elected by the Lok Sabha every year from amongst its own members, according to **the principles of proportional representation by means of a single transferable vote**. **Hence, option (d) is correct.**

40. **Consider the following statements regarding the procedure for the amendment of the Constitution as laid down in Article 368.**
1. A bill to this effect can only be introduced in the Lok Sabha first.
2. Such a bill must be introduced by a minister.

3. In case of a disagreement between the two Houses, a joint sitting of the two Houses is held for the purpose of deliberation and passage of the bill.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (D)
Explanation: An amendment of the Constitution can be initiated only by the introduction of a bill for the purpose in either House of Parliament and not in the state legislatures. **The bill can be introduced either by a minister or by a private member and does not require prior permission of the president**. **The bill must be passed in each House by a special majority, that is, a majority (that is, more than 50 per cent) of the total membership of the House and a majority of two-thirds of the members of the House present and voting**. Each House must pass the bill separately. In case of a disagreement between the two Houses, there is no provision for holding a joint sitting of the two Houses for the purpose of deliberation and passage of the bill. **Hence, all statements are incorrect.**

41. **Which of the following regions of the world is/are seismically active?**
1. Mid-Atlantic Ridges
2. Alpine-Himalayan belt
3. Central Africa

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: (A)
Explanation:
· Seismic belt, narrow geographic zone on the Earth's surface along which most earthquake activity occurs. **The two major seismic belts are the Circum-Pacific Belt, which surrounds the Pacific Ocean, and the Alpine Belt or Alpine-Himalayan orogenic belt, which stretches from the Azores through the Mediterranean and Middle East to the Himalayas and Indonesia,** where it joins the Circum-Pacific Belt. A purely oceanic seismic belt lies along the mid-Atlantic ridge.
· Seismicity of West and Central Africa is low to moderate, as is normal with stable continental. **Hence, option (a) is correct.**

42. **Consider the following statements regarding the Sea floor:**
1. Volcanic eruptions are common along the mid-oceanic ridges.
2. The age of the rocks decreases as one moves away from the crest.
3. The ocean crust rocks are much younger than the continental rocks.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Sea floor spreading is verified using these phenomena:
· It was realised that all along the mid-oceanic ridges, volcanic eruptions are common and they bring huge amounts of lava to the surface in this area. The sediments on the ocean floor are unexpectedly very thin.
· The **age of the rocks increases as one moves away from the crest.**
· The ocean crust rocks are much younger than the continental rocks.
· The sediments on the ocean floor are unexpectedly very thin.
· The **deep trenches have deep-seated earthquake occurrences** while in the **mid-oceanic ridge areas, the quake foci have shallow depths.**
Hence, statement 2 is incorrect.

43. **Which of the following are the conditions for the emergence of a tropical cyclone?**
1. Unstable condition through the Troposphere
2. Strong Coriolis force
3. Strong vertical wind wedge
4. Large and continuous supply of warm and moist air.

Select the correct answer using the code given below:
(a) 1, 2, 3
(b) 1, 2, 4
(c) 2, 3, 4
(d) 1, 2, 3, 4

Answer: (B)
Explanation: Some initial conditions for the emergence of a tropical cyclone are:
i. Large and continuous supply of warm and moist air that can release enormous latent heat.
ii. **Strong Coriolis force** that can prevent the filling of low pressure at the centre (absence of Coriolis force near the equator prohibits the formation of tropical cyclones between 0°-5° latitude).
iii. Unstable condition through the troposphere that creates local disturbances around which a cyclone develops.

iv. Finally, the **absence of a strong vertical wind wedge**, disturbs the vertical transport of latent heat.
Hence, option (b) is correct.

44. **Consider the following statements regarding the theory of Plate tectonics:**
1. It is another name for the theory of continental drift.
2. It is the theory that Earth's outer shell is divided into several plates that glide over the mantle.
3. It discards the conventional geological view that there is a convectional current flowing in the mantle.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: The plates act like a hard and rigid shell compared to Earth's mantle. **This strong outer layer is called the lithosphere. Plate tectonics is the modern version of continental drift, a theory first proposed by scientist Alfred Wegener in 1912.** Wegener didn't have an explanation for how continents could move around the planet, but researchers do now. **Plate tectonics is thus said to be the unifying theory of geology**. The driving force behind plate tectonics is convection in the mantle. **Hot material near Earth's core rises, and colder mantle rock sinks**. In terms of analogy, it is kind of a pot boiling on a stove. The convection drives plate tectonics through a combination of pushing and spreading apart at mid-ocean ridges and pulling and sinking downwards at subduction zones. **Hence, statement 2 is correct.**

45. **Consider the following statements regarding the islands of the Arabian Sea:**
1. The Indian islands of the Arabian Sea spread from zero-degree latitude to fifteen-degree North latitude.
2. The islands of the Arabian Sea include only Lakshadweep and not Minicoy.
3. They are largely made of coral deposits.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: The **latitudinal extent of India begins from nearly 8 degrees north**. An Indian island cannot begin from zero-degree latitude. **The islands of the Arabian Sea include Lakshadweep and Minicoy**. These are scattered between 8°N-12°N and 71°E -74°E longitude. **These islands are located at a distance of 280 km-480 km off the Kerala coast**. The entire island group is built of coral deposits. **Hence, statement 3 is correct.**

46. **'Monetary Base', managed by the Reserve Bank of India, consists of:**
1. Deposits held by the Government of India with RBI.
2. Sum total of the capital of all financial institutions regulated by RBI.
3. Notes and coins in circulation with the public.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Monetary Base is also called as **High powered money**. It co**nsists of currency (notes and coins in circulation with the public and vault cash of commercial banks) and deposits held by the Government of India and commercial banks with RBI.** If a member of the public produces a currency note to RBI the latter must pay her value equal to the figure printed on the note. Similarly, the deposits are also refundable by RBI on demand from deposit-holders. **These items are claims that the general public, government or banks have on RBI and hence are considered to be the liability of RBI**. **Hence, statement 2 is incorrect.**

47. Consider the following statements regarding indirect taxes:
1. Indirect tax is a tax levied by the Government on goods and services and not on the profit or revenue of an individual.
2. Indirect taxes are termed regressive taxing mechanisms because they are charged at higher rates than direct taxes.
3. The cascading effect of the tax is a situation wherein the end-consumer of any goods or service has to bear the burden of the tax to be paid on the previously calculated tax and as a result would suffer an increased price.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Indirect Tax is a **tax levied by the Government on goods and services and not on the income, profit or revenue of an individual and it can be shifted from one taxpayer to another.** Indirect

taxes are charged the same for all income groups. **Few indirect taxes:** Customs Duty, Central Excise Duty, Service Tax, Sales Tax and Value Added Tax (VAT). The cascading effect of the tax is a situation wherein the end-consumer of any goods or service has to bear the burden of the tax to be paid on the previously calculated tax and as a result, would suffer an increased or inflated price. **Hence, statement 2 is incorrect.**

48. **Consider the following policy measures by the government:**
1. Increasing foreign aid to underdeveloped nations
2. Providing export subsidies
3. Increasing import duties

Which of the policy measures given above may be used to reduce the Current Account Deficit (CAD)?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (C)
Explanation: The **current account measures the flow of goods, services and investments into and out of the country**. We run into a deficit if the value of the goods and services we import exceeds the value of those we export. The current account includes net income, including interest and dividends, and transfers, like foreign aid. Therefore, increasing foreign aid to underdeveloped nations increases the current account deficit. However, increasing import duties and providing export subsidies help in reducing the current account deficit. **Hence, option (c) is correct.**

49. **Consider the following statements:**
1. Headline inflation is a measure of inflation within an economy, including commodities that tend to be more volatile and prone to inflationary spikes.
2. Headline inflation presents an accurate picture of an economy's inflationary trend since sector-specific inflationary spikes persist.

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:
· **Headline inflation** is a **measure of the total inflation within an economy**, including commodities such as food and energy prices (e.g., oil and gas), which tend to be **much more volatile and prone to inflationary spikes**. **Hence, statement 1 is correct.**

· Headline inflation may not present an accurate picture of an economy's inflationary trend since sector-specific inflationary spikes are unlikely to persist. **Hence, statement 2 is not correct.**

50. **Consider the following statements regarding the Fiscal Responsibility and Budget Management (FRBM) Act, 2003:**
1. The Act envisages the setting of limits on the Central government's debt and deficits.
2. The Act made the Central government responsible for ensuring inter-generational equity in fiscal management and long-term macroeconomic stability.
3. The law contains an 'escape clause' under which the Centre can exceed the annual fiscal deficit target.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: Enacted in August 2003, the **legislation is aimed at making the Central government responsible for ensuring "inter-generational equity in fiscal management and long-term macro-economic stability**". To achieve this, the Act envisages the setting of limits on the Central government's debt and deficits as well as mandating greater transparency in fiscal operations of the Central government and the conduct of fiscal policy in a medium-term framework. **The rules for implementing the Act were notified in July 2004** and since then every Budget of the Union government has included a **Medium Term Fiscal Policy Statement** that specifies the annual revenue and fiscal deficit goals over a three-year horizon. **Hence, all statements are correct.**

51. **Consider the following statements regarding Dry ice:**
1. Dry ice is the solid form of carbon dioxide.
2. It has a higher temperature than that of water ice.
3. It is used to prevent insect activity in closed containers of grains and grain products.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (C)
Explanation: Dry ice is the solid form of carbon dioxide. It is used primarily as a cooling agent. Its advantages include lower temperature than that of water ice and not leaving any residue (other than

incidental frost from moisture in the atmosphere). It is **useful for preserving frozen foods where mechanical cooling is unavailable**. This extreme cold makes the solid dangerous to handle without protection due to burns caused by freezing (frostbite). While generally not very toxic, the outgassing from it can cause hypercapnia (abnormally elevated carbon dioxide levels in the blood) due to build-up in confined locations. **Dry ice can be used to arrest and prevent insect activity in closed containers of grains and grain products, as it displaces oxygen, but does not alter the taste or quality of foods**. For the same reason, it can prevent or retard food oils and fats from becoming rancid. When dry ice is placed in water, sublimation is accelerated, and low-sinking, dense clouds of smoke-like fog are created. **This is used in fog machines, at theatres, haunted house attractions, and nightclubs for dramatic effects. One of the largest mechanical uses of dry ice is blast cleaning. Hence, statement 2 is not correct.**

52. **Consider the following statements regarding Machine to Machine communications (M2M):**
1. Machine-to-machine communications refer to automated applications that involve machines or devices communicating through a network without human intervention.
2. It enables data to be transmitted from one device to another device through wired and wireless communications networks.

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: M2M communications refer to **automated applications that involve machines or devices communicating through a network without human intervention.** Sensors and communication modules are embedded within M2M devices, enabling data to be transmitted from one device to another device through wired and wireless communications networks. **Hence, both statements are correct.**

53. **Acinetobacter baumannii, Enterococcus faecalis, Escherichia coli are:**
(a) Drugs administered to livestock as painkillers/anti-inflammatory drugs.
(b) Vectors that cause Dengue and Malaria
(c) Pathogens that have the ability to develop resistance to antibiotics.
(d) None of the above

Answer: (C)
Explanation: Some of the pathogens to look out for are **Acinetobacter baumannii, Enterococcus faecalis, Escherichia coli, Salmonella typhi, Streptococcus pneumoniae and many more.** These pathogens are commonly implicated as causative agents of healthcare-associated infections because of their ability to develop resistance to antibiotics. **Hence, option (c) is correct.**

54. **Consider the following statements regarding Vitamin D deficiency:**
1. Vitamin D deficiency is often associated with rickets.
2. In rickets, the bone tissue does not correctly mineralise calcium and phosphorus, leading to softening of bones resulting in skeletal deformities.
3. Vitamin D plays a crucial role in depression, mood swings, anxiety and sleep quality.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: Vitamin D deficiency is often associated with rickets. In rickets, the bone tissue does not correctly mineralise calcium and phosphorus, leading to softening of bones resulting in skeletal deformities. It **plays a crucial role in depression, mood swings, anxiety and sleep quality. Hence, all statements are correct.**

55. **Consider the following statements:**
1. Dengue is a viral infection transmitted to humans through the bite of infected female mosquitoes.
2. When a mosquito bites, it not only sucks blood but also secretes saliva that enters the bloodstream.
3. Specific medications and vaccines are available to treat dengue.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Dengue is a viral infection transmitted to humans through the bite of infected mosquitoes. **The primary vectors that transmit the disease are female Aedes aegypti mosquitoes and, to a lesser extent, Ae. albopictus**. There is no specific treatment for dengue/severe dengue. Early detection of disease progression associated with severe dengue, and access to proper medical care lowers fatality rates of severe dengue to below 1%. **When a mosquito bites, it not**

only sucks blood but secretes saliva. This saliva enters the blood. There is an exchange of fluids between the mosquito and the bloodstream. **Hence, statement 3 is incorrect.**

56. **Consider the following statements regarding Black Carbon:**
1. Black carbon is a component of fine particulate matter, formed through the incomplete combustion of fossil fuels, biofuel, and biomass.
2. In the tropics, black carbon in soils significantly contributes to soil fertility.
3. Black carbon significantly increases the albedo when deposited on snow and ice.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Black carbon (BC) is a component of fine particulate matter. **Black carbon consists of pure carbon in several linked forms. It is formed through the incomplete combustion of fossil fuels, biofuel, and biomass, and is emitted in both anthropogenic and naturally occurring soot**. Black carbon causes human morbidity and premature mortality. **In climatology, black carbon is a climate-forcing agent**. Black carbon warms the Earth by absorbing sunlight and heating the atmosphere and by reducing albedo when deposited on snow and ice. **In the tropics, black carbon in soils significantly contributes to fertility as it is able to absorb important plant nutrients**. **Hence, statement 3 is incorrect.**

57. **Consider the following statements:**
1. Cold-water corals, in general, have a greater amount of zooxanthellae than warm-water corals and do not build reef-like structures.
2. Cold-water corals differ from warm-water corals because the former does not contain symbiotic algae for photosynthesis and grows more slowly.

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: Corals that inhabit the colder deep waters of continental shelves and offshore canyons, ranging from 50 to over 1000m depths lack zooxanthellae and may build reef-like structures or occur solitarily. **Cold-water corals are different from their warm-water counterparts because they do not contain symbiotic algae for photosynthesis and grow more slowly**. Cold-water corals obtain all their energy from organic matter and zooplankton, which they catch from the currents drifting past. **Cold-water corals can be found over a wide range of latitudes, from tropical to Polar Regions, and from the shallow to the deep seas**. **Hence, statement 1 is incorrect.**

58. **Oil spills can be treated with bioremediation by using some species of:**
1. Fungi
2. Plants
3. Bacteria
4. Archea
5. Algae

How many of the above options are correct?
(a) Only two
(b) Only three
(c) Only four
(d) All five

Answer: (D)
Explanation: Bioremediation refers to the **use of specific microorganisms or plants to metabolize and remove harmful substances.** These organisms are known for their biochemical and physical affinity to hydrocarbons among other pollutants. Various types of **bacteria, archaea, algae, fungi, and some species of plants are all able to break down specific toxic waste products into safer constituents. Hence, all are correct.**

59. **Plants prepare Glucose in the process of:**
(a) Respiration
(b) Degradation
(c) Photosynthesis
(d) Mineral absorption

Answer: (C)
Explanation: In contrast to humans and other animals, plants can produce glucose through a process known as photosynthesis. The green parts of plants use **sunlight, water, and the gas carbon dioxide** from the air to produce glucose and oxygen. **Hence, option (c) is correct.**

60. **Consider the following statements regarding the benefits of Pulses on the Environment:**
1. Pulses perform biological fixation of environmental nitrogen.
2. Pulses enhance soil fertility and reduce the consumption of major fertilisers required for the cultivation of food crops.
3. The roots of pulses and legumes contain soil-enriching bacteria collectively known as Rhizobium.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (D)
Explanation: The **roots of pulses and legumes contain soil-enriching bacteria collectively known as Rhizobium**. Therefore pulses perform biological fixation of environmental nitrogen. **They also increase organic matter in the soil, improve quality and maintain its biodiversity**. Pulses enhance fertility and reduce the consumption of major fertilisers required for the cultivation of food crops by millions of tonnes globally. **Hence, all statements are correct.**

61. **Consider the following statements regarding the Attorney General for India:**
1. The Attorney General for India is the Government of India's first law officer and has the right of audience in all courts of the country.
2. He is a member of the Union Cabinet.
3. According to the Constitution of India, it shall be the duty of the Attorney-General to perform such duties of a legal character, assigned to him by the President.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The Constitution of India places the post of the A-G on a special footing. **The A-G is the Government of India's first law officer and has the right to be audited in all courts of the country**. Article 76(2) of the Constitution says "It shall be the duty of the Attorney-General to give advice to the Government of India upon such legal matters and to perform such other duties of a legal character, as may from time to time be referred or assigned to him by the President". The A-G is also supposed to "discharge the functions conferred on him by or under this Constitution or any other law for the time being in force". **Also, the A-G for India is not, like the A-G for England and Wales and the A-G of the United States, a member of the Cabinet**. **Hence, statement 2 is not correct.**

62. **Consider the following statements, with reference to the Motion of Thanks:**
1. Amendments to Motion of Thanks can be moved in both houses in such form as may be considered appropriate by the Speaker of Lok Sabha.
2. The Motion of Thanks is deemed to be a no-confidence motion.

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: Notices of amendments to the Motion of Thanks on the President's Address can be tabled after the President has delivered his Address. Amendments may refer to matters contained in the Address as well as to matters, in the opinion of the member, the Address has failed to mention. **Amendments can be moved to the Motion of Thanks in such form as may be considered appropriate by the Speaker in Lok Sabha and Chairman in Rajya Sabha**. **Hence, statement 1 is not correct.**

Members of Parliament vote on this motion of thanks. This motion must be passed in both houses. A failure to get a motion of thanks passed amounts to the defeat of the government and leads to the collapse of the government. This is why, the Motion of Thanks is deemed to be a no-confidence motion. **Hence, statement 2 is correct.**

63. **Consider the following statements regarding Lok Sabha:**
1. The work and conduct of the Speaker cannot be discussed and criticized in the Lok Sabha except on a substantive motion.
2. No discussion on a matter of general public importance can take place except on a motion made with the consent of the Speaker.

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 work and conduct of the Speaker cannot be discussed and criticized in the Lok Sabha except on a **Substantive motion:** This is done with a **view to safeguard the independence and Impartiality of the office of the Speaker as it is vested with great prestige, position and authority**. No discussion on a matter of general public importance can take place except on a motion made with the consent of the Speaker/Chairman as the case may be. **Hence, both statements are correct.**

64. **Consider the following statements regarding the Preamble of the Indian Constitution:**
1. The original Preamble, adopted by the Constituent Assembly in 1949, declared India a "Sovereign, Socialist, Secular, Democratic, Republic".

2. The Preamble states the objects of the Constitution and acts as an aid during the interpretation of the Articles in the Constitution.
3. The 42nd Amendment to the Constitution changed "unity of the nation" to "unity and integrity of the nation".

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (C)
Explanation: A preamble is an introductory statement in a document that explains the document's philosophy and objectives. In a Constitution, it presents the intention of its framers, the history behind its creation, and the core values and principles of the nation. **The Preamble is based on the Objective Resolution moved by Jawaharlal Nehru in the Constituent Assembly on December 13, 1946. The Resolution was adopted on January 22, 1947.** Although not enforceable in court, the Preamble states the objects of the Constitution and acts as an aid during the interpretation of the Articles when language is found ambiguous. **The original Preamble, adopted by the Constituent Assembly in 1949, declared India a "Sovereign Democratic Republic".** By the 42nd Amendment of 1976, enacted during the Emergency, **the words "Socialist" and "Secular" were inserted; the Preamble now reads "Sovereign Socialist Secular Democratic Republic".** The 42nd Amendment to the Constitution passed in 1976, replaced the words "sovereign democratic republic" with "sovereign socialist secular democratic republic". It also changed "unity of the nation" to "unity and integrity of the nation". **Hence, statement 1 is not correct.**

65. **Which principle among the following was added to the Directive Principles of State Policy by the 42nd Amendment to the Constitution?**
(a) Equal pay for equal work for both men and women.
(b) Participation of workers in the management of industries.
(c) Right to work, education and public assistance.
(d) Securing living wage and human conditions of work for workers.

Answer: (B)
Explanation: The 42nd Amendment to the Constitution Added three new Directive Principles viz., **equal justice and free legal aid, participation of workers in the management of industries and protection of the environment, forests and wildlife. Hence, option (b) is correct.**

66. **Consider the following statements regarding the religious practices of the Harappan civilization:**
1. Linga worship was prevalent during the Harappan civilization.
2. Religion was strictly masculine and patriarchal in nature.

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 chief male deity was **Pasupati**, (proto-Siva) represented in seals as sitting in a **yogic posture with three faces and two horns**. In later times, Linga worship was prevalent. **Hence, statement 1 is correct.**
- The **chief female deity was the Mother Goddess**, which shows that the religion was not strictly masculine in nature. She was represented in terracotta figurines. **Hence, statement 2 is not correct.**

67. **Consider the following statements regarding the Mahalwari system:**
1. Warren Hastings was associated with the conception of this system.
2. Under the system, ryots paid a variable sum to the Zamindars who then paid to the British.
3. Village lands, forestland and pastures were included under the system.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: In the North Western Provinces of the Bengal Presidency (most of this area is now in Uttar Pradesh), an Englishman called **Holt Mackenzie** devised the new system which came into effect in **1822**. He felt that the village was an important social institution in north Indian society and needed to be preserved. **Under his directions, collectors went from village to village, inspecting the land, measuring the fields, and recording the customs and rights of different groups**. The estimated revenue of each plot within a village was added up to calculate the revenue that each village (mahal) had to pay. This demand was to be revised periodically, not permanently fixed. **The charge of collecting the revenue and paying it to the**

Company was given to the village headman, rather than the zamindar. This system came to be known as the Mahalwari settlement. The land included under this system consisted of all land of the villages, even the forestland, pastures etc. **Hence, only statement 3 is correct.**

68. **Welby Commission set up in British India concerned an enquiry into the:**
(a) Royal Indian Navy (RIN) mutiny
(b) Atrocities of the Jallianwala Bagh massacre
(c) Educational Reforms in Indian Universities
(d) Drain of wealth issue

Answer: (D)
Explanation: Dadabhai Naoroji in his famous book **Poverty and UnBritish Rule in India wrote his Drain Theory**. He showed how India's wealth was going away to England in the form of (a**) salaries, (b) savings, (c) pensions, (d) payments to British troops in India and (e) profits of the British companies**. The British Government was forced to appoint the Welby Commission, with Dadabhai as the first Indian as its member, to enquire into the Matter. T**he Welby Commission's report, published in 1900,** showed a number of cases where excessive or unjust payments had been made by the Indian government. **Hence, option (d) is correct.**

69. **Consider the following statements regarding Kuchipudi:**
1. It is mentioned in Natya Shastra.
2. As per tradition, the dance must be accompanied by live vocals and not music.
3. It is recognized as an Indian classical dance.

How many of the above statements are/correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Kuchipudi has its roots in the ancient Hindu Sanskrit text of Natya Shastra. Like all major classical dances of India, it was also developed as a religious art linked to travelling bards, temples and spiritual beliefs. **The Kuchipudi style was conceived by Siddhendra Yogi, a talented Vaishnava poet of the 17th century.** It begins with an invocation to Lord Ganesha followed by **nritta** (non-narrative and abstract dancing); **Shabdam** (narrative dancing) and **Natya**. The dance is accompanied by a song which is typically Carnatic music. The singer is accompanied by musical instruments like mridangam, violin, flute and tambura. It is one of the major Indian classical dances. **Hence, statement 2 is incorrect.**

70. **Consider the following statements regarding Thanjavur painting:**
1. It largely depicts the social and economic life of the common man.
2. The paintings are notable for their adornment in the form of semi-precious stones and glass.

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: Thanjavur painting is a classical South Indian painting style, which was inaugurated from the town of Thanjavur (anglicized as Tanjore) and spread across the adjoining and geographically contiguous Tamil country. The art form draws its immediate resources and inspiration from way back about 1600 AD, a period when the Nayakas of Thanjavur under the suzerainty of the Vijayanagara Rayas encouraged art—chiefly, classical dance and music—as well as literature, both in Telugu and Tamil and painting of chiefly Hindu religious subjects in temples. **It is distinguished by its famous gold coating.** The paintings are mostly of Gods and Goddesses because this art of painting flourished at a time when fine-looking and striking temples were being constructed by rulers of several dynasties. **Hence, statement 2 is correct.**

71. **Consider the following statements regarding the office of 'whip':**
1. The office has been established by the Rules of Business in each House of Parliament.
2. Only the ruling party is allowed to have a whip in each house of Parliament.

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 office of 'whip' is mentioned neither in the Constitution of India nor in the Rules of the House nor in a Parliamentary Statute. It is **based on the conventions of the parliamentary government**. **Every political party, whether ruling or Opposition has its own whip in the Parliament**. He is appointed by the political party to serve as an assistant floor leader. He is charged with the responsibility of ensuring the attendance of his party members in large numbers and securing their support in favour of or against a particular issue. **He regulates and monitors their**

behaviour in the Parliament. The members are supposed to follow the directives given by the whip. Otherwise, disciplinary action can be taken. **Hence, both statements are not correct.**

72. **Consider the following statements regarding Constituent assembly:**
1. The assembly had representation from both British India and princely states.
2. The system of proportional representation was adopted in the election of the assembly.
3. The Assembly included important ministers of the British Cabinet as ex-officio members.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The total strength of the Constituent Assembly was to be 389. Of these, 296 seats were to be allotted to British India and 93 seats to the Princely States. Out of **296 seats allotted to British India, 292 members were to be drawn from the eleven governors' provinces and four from the four chief commissioners' provinces**, one from each. Each province and princely state (or group of states in the case of small states) were to be allotted seats in proportion to their respective population. Roughly, one seat was to be allotted for every million population. Seats allocated to each British province were to be decided among the three principal communities—Muslims, Sikhs and general, in proportion to their population.
The representatives of each community were to be **elected by members of that community in the provincial legislative assembly and voting was to be by the method of proportional representation by means of a single transferable vote**. There was no communal representation. It included all the important personalities of India at that time, with the exception of Mahatma Gandhi and M.A. Jinnah. **Hence, statement 3 is not correct.**

73. **Consider the following statements:**
1. Fundamental Rights and Fundamental duties are correlative and inseparable.
2. The original constitution did not contain fundamental duties and fundamental rights, and both were added based on the recommendation of the Swaran Singh Committee.

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: Fundamental Rights and Fundamental duties are correlative and inseparable. Also, **the original constitution contained only the fundamental rights and not the fundamental duties**. The fundamental duties of citizens were added to the Constitution later in **1976 on the recommendation of the Swaran Singh Committee**. In 2002, one more Fundamental Duty was added. Although both, Fundamental Rights and Fundamental Duties are inseparable, there are certain differences between them. **Hence, statement 1 is correct.**

74. **Which one of the following Directive Principles was not originally provided in the Constitution of India?**
(a) Uniform civil code for the citizens.
(b) Safeguard forests and wildlife.
(c) Organization of agriculture and animal husbandry.
(d) Organization of village panchayats.

Answer: (B)
Explanation: The 42nd Amendment Act of 1976 added four new Directive Principles to the original list. They require the State:
i. To secure opportunities for the healthy development of children **(Article 39).**
ii. To promote equal justice and to provide free legal aid to the poor **(Article 39 A).**
iii. To take steps to secure the participation of workers in the management of industries **(Article 43 A).**
iv. To protect and improve the environment and to safeguard forests and wildlife **(Article 48 A).**

75. **Consider the following statements regarding the procedure for the amendment of the Constitution as laid down in Article 368:**
1. A bill to this effect can only be introduced in the Lok Sabha first.
2. Such a bill must be introduced by a minister.
3. In case of a disagreement between the two Houses, a joint sitting of the two Houses is held for the purpose of deliberation and passage of the bill.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (D)
Explanation: An amendment of the Constitution can be initiated only by the introduction of a bill for the purpose in either House of Parliament and not in the

state legislatures. **The bill can be introduced either by a minister or by a private member and does not require prior permission of the president.** The bill must be passed in each House by a special majority, that is, a **majority (that is, more than 50 per cent) of the total membership of the House and a majority of two-thirds of the members of the House present and voting**. Each House must pass the bill separately. In case of a disagreement between the two Houses, there is no provision for holding a joint sitting of the two Houses for the purpose of deliberation and passage of the bill. **Hence, all statements are not correct.**

76. **Consider the following statements regarding the Sea floor:**
1. Volcanic eruptions are common along the mid-oceanic ridges.
2. The age of the rocks decreases as one moves away from the crest.
3. The ocean crust rocks are much younger than the continental rocks.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:
Seafloor spreading is verified using these phenomena:
1. It was realised that all along the mid-oceanic ridges, **volcanic eruptions are common and they bring huge amounts of lava to the surface in this area**. The sediments on the ocean floor are unexpectedly very thin.
2. The age of the rocks increases as one moves away from the crest.
3. The ocean crust rocks are much younger than the continental rocks.
4. The sediments on the ocean floor are unexpectedly very thin.
5. The deep trenches have deep-seated earthquake occurrences while in the mid-oceanic ridge areas, the quake foci have shallow depths. **Hence, statement 2 is incorrect.**

77. **Which of the following are the conditions for the emergence of a tropical cyclone?**
1. Unstable condition through the Troposphere
2. Strong Coriolis force
3. Strong vertical wind wedge
4. Large and continuous supply of warm and moist air.

Select the correct answer using the code given below:
(a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (C)
Explanation:
Some initial conditions for the emergence of a tropical cyclone are:
i. Large and continuous supply of warm and moist air that can release enormous latent heat.
ii. Strong Coriolis force that can prevent the filling of low pressure at the centre (absence of Coriolis force near the equator prohibits the formation of tropical cyclones between 0°-5° latitude).
iii. Unstable condition through the troposphere that creates local disturbances around which a cyclone develops.
iv. Finally, the absence of a strong vertical wind wedge, disturbs the vertical transport of latent heat.

78. **Consider the following statements:**
1. Earth's crust is the thinnest of all the major layers of Earth.
2. The crust is thicker on the continent than on the ocean floor.
3. The oceanic crust mainly consists of manganese and iron.

How many of the above statements is/are incorrect?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: The uppermost layer over the earth's surface is called the crust. It is the **thinnest of all the layers. It is about 35 km. on the continental masses and only 5 km on the ocean floors.** The main mineral constituents of the continental mass are **silica and alumina**. It is **thus called sial (si-silica and al-alumina).** The oceanic crust mainly consists of **silica and magnesium**; it is therefore called **sima (si-silica and ma-magnesium). Hence, statement 3 is not correct.**

79. **Hot Spots within the earth help produce Geothermal Energy. What are these 'Hot Spots'?**
(a) Areas of intense magnetic activity within the upper mantle.
(b) Areas of intense pressure inside the mantle.
(c) Regions of high volcanism on the earth's surface.
(d) Region in the crust where hot molten rocks are trapped.

Answer: (D)
Explanation: Due to geological changes, **molten rocks formed in the deeper hot regions of the earth's crust are pushed upward and trapped in certain regions**

called 'hot spots'. When underground water comes in contact with the hot spot, steam is generated. Sometimes hot water from that region finds outlets at the surface. Such outlets are known as hot springs. **Hence, option (d) is correct.**

80. **Consider the following statements:**
1. Tur is a long-duration crop and requires more irrigation than cotton crops.
2. Tur has a deep taproot system that allows the plant to draw moisture from the soil better than cotton.

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: Given its long duration and being a relatively water-intensive crop, **cotton needs a minimum of 5-6 irrigations, especially during the flowering, bud and boll formation stages**. "Tur is also a long-duration crop but doesn't need more than 2-3 irrigations. The crop's deep taproot system allows its plants to draw moisture from the soil better than cotton. **Hence, statement 1 is not correct.**

81. **Consider the following statements:**
1. Headline inflation is a measure of inflation within an economy, including commodities that tend to be more volatile and prone to inflationary spikes.
2. Headline inflation presents an accurate picture of an economy's inflationary trend since sector-specific inflationary spikes persist.

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:
- Headline inflation is a **measure of the total inflation within an economy, including commodities such as food and energy prices** (e.g., oil and gas), which tend to be much more volatile and prone to inflationary spikes. **Hence, statement 1 is correct.**
- Headline inflation may not present an accurate picture of an economy's inflationary trend since sector-specific inflationary spikes are unlikely to persist. **Hence, statement 2 is not correct.**

82. **Consider the following statements regarding the Fiscal Responsibility and Budget Management (FRBM) Act, 2003:**
1. The Act envisages the setting of limits on the Central government's debt and deficits.
2. The Act made the Central government responsible for ensuring inter-generational equity in fiscal management and long-term macroeconomic stability.
3. The law contains an 'escape clause' under which the Centre can exceed the annual fiscal deficit target.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (C)
Explanation: Enacted in **August 2003, the legislation is aimed at making the Central government responsible for ensuring "inter-generational equity in fiscal management and long-term macro-economic stability".** To achieve this, the Act envisages the setting of limits on the Central government's debt and deficits as well as mandating greater transparency in fiscal operations of the Central government and the conduct of fiscal policy in a medium-term framework. **The rules for implementing the Act were notified in July 2004** and since then every Budget of the Union government has included a **Medium Term Fiscal Policy Statement** that specifies the annual revenue and fiscal deficit goals over a three-year horizon. **Hence, all statements are correct.**

83. **Consider the following statements regarding the difference between the Consumer Price Index (CPI) and GDP deflator:**
1. GDP deflator includes prices of imported goods but they are not included in CPI.
2. While CPI is released by the Central Statistics Office (CSO), the data on the GDP deflator is released by the Labour Bureau.
3. The weights are constant in CPI, but they differ according to the production level of each good in the GDP deflator.

How many of the above options are/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation:
CPI may differ from GDP deflator because:
1. The goods purchased by consumers do not represent all the goods that are produced in a

country. **GDP deflator takes into account all such goods and services.**
2. **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.
3. The weights are constant in CPI – but they differ according to the production level of each good in the GDP deflator.

The **Ministry of Statistics and Programme Implementation (MOSPI)** came out with a GDP deflator in National Accounts Statistics as price indices. **Hence, only statement 3 is correct.**

84. **Which of the following is/are included in the calculation of National Income in India?**
1. Salary of employees
2. Exports of the IT sector
3. Sale of Land

How many of the above options are/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: National Income is defined as the **total monetary value of all goods and services produced within a country during a given period of time.** Gains on the sale of land will not be included in the estimation of National Income. Capital gains will not be included in the national income as they do not add to the current flow of goods and services in the economy. **Hence, statement 3 is not correct.**

85. **Which of the following situations can lead to inflation?**
(a) Sluggish growth of aggregate demand
(b) Higher levels of unemployment
(c) Reduction in the money supply
(d) Rapid growth of aggregate demand outweighing supply

Answer: (D)
Explanation: Demand-pull inflation is a **period of inflation that arises from rapid growth in aggregate demand**. It occurs when **economic growth is too fast**. If aggregate demand (AD) rises faster than productive capacity (LRAS), then firms will respond by putting up prices, creating inflation. **Hence, option (d) is correct.**

86. **Consider the following statements regarding Distributed ledger technology (DLT):**
1. Distributed ledger technology (DLT) is a digital system for recording the transaction of assets in which the details are recorded in multiple places at the same time.
2. Unlike traditional databases, distributed ledgers have central data storage or administration functionality.
3. Blockchain technology is a specific kind of Distributed ledger technology.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation:
- Distributed ledger technology (DLT) is a **digital system for recording the transaction of assets in which the transactions and their details are recorded in multiple places at the same time. Hence, statement 1 is correct.**
- Unlike traditional databases, distributed ledgers have no central data store or administration functionality. **Hence, statement 2 is not correct.**
- Blockchain technology is a s**pecific kind of DLT that came to prominence after Bitcoin, a cryptocurrency that used it, became popula**r. Cryptocurrencies such as Bitcoin use codes to encrypt transactions and stack them up in blocks, creating Blockchains. It is the use of codes that differentiates cryptocurrencies from other virtual currencies. **Hence, statement 3 is correct.**

87. **Consider the following statements regarding Bio-enzymes:**
1. Bio-enzymes are organic solutions produced through fermentation of organic waste like fruits, vegetable peels and flowers by mixing in sugar, jaggery/molasses and water.
2. Yeast can be used to slow down the process of fermentation.

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: Bio-enzymes are organic solutions produced through **fermentation of organic waste including various fruits, vegetable peels and flowers, by mixing in sugar, jaggery/molasses and water**. It takes 60-100 days to ferment organic waste. To fasten the fermentation, yeast can be used as a culture to prepare it in 45-50 days. **Hence, statement 1 is correct.**

88. **Consider the following statements regarding Proteins:**
1. Proteins need to take a precise three-dimensional shape to become functional entities.
2. Misfolding of proteins can cause a number of diseases like Parkinson's disease and cataracts.
3. Most of the time, protein folding happens automatically.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (B)
Explanation: DNA is a linear chain of nucleotides, portions of which are faithfully transcribed into linear messenger RNA. The message in this RNA is translated into **strings of amino acids – proteins.** Proteins need to take a precise three-dimensional shape to become functional entities. This protein folding does not happen all by itself, at least most of the time. **A special bunch of proteins called molecular chaperones assist in correctly folding the protein.** Misfolding of proteins can cause a number of diseases. **Alpha-synuclein protein, present in neurons, is wrongly folded in Parkinson's disease.** Aberrant folding of crystallins of the eye lens leads to cataracts. In the eye lens, an abundant subset of proteins called alpha-crystallins themselves serve as chaperones. **Hence, statement 3 is not correct.**

89. **Monoclonal antibodies have been used in the treatment of:**
1. HIV
2. Ebola
3. COVID-19

Select the correct answer using the code given below:
(a) 1 and 2 only
(b) 1 and 3 only
(c) 1 only
(d) 1, 2 and 3

Answer: (D)
Explanation: Besides COVID-19, monoclonal antibodies have been used in the treatment of cancers as well as Ebola and HIV. **Hence, all are correct.**

90. **The term 'Neural network' is sometimes seen in news means:**
(a) A network of disengaged computer clouds
(b) A point-to-point network for urgent assistance in cybercrime matters
(c) A process that mimics the way the human brain operates.
(d) Networking between cells based on their mRNA

Answer: (C)
Explanation: A neural network is a series of algorithms that endeavours to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. In this sense, **neural networks refer to systems of neurons, either organic or artificial in nature**. Neural networks can adapt to changing input; so the network generates the best possible result without needing to redesign the output criteria. **The concept of neural networks, which has its roots in artificial intelligence,** is swiftly gaining popularity in the development of trading systems. **Hence, option (c) is correct.**

91. **Increased Snow cover on a water body can lead to:**
1. Sudden spurt in phytoplankton populations that are not dependent on photosynthesis.
2. Improved oxygen exchange and nutrient recycling in the lake.
3. A condition of winterkill causing large-scale death of fishes and organisms.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: Phytoplankton float on the top surface of water bodies and require sunlight to thrive. Ice cover will reduce their breeding grounds and population. **The snow cover blocks the exchange of nutrients and oxygen from the atmosphere, however, the same may continue within the water stream**. But it is worse than before. Snow cover of ice on the water body can effectively cut off light, plunging the waters into darkness. Hence photosynthesis stops but respiration continues. Thus, in **shallow lakes, oxygen gets depleted, and due to lack of oxygen, there is large-scale death of fish and other organisms. This condition is known as winterkill**. **Hence, statement 3 is correct.**

92. **Consider the following statements regarding Black Carbon:**
1. Black carbon is a component of fine particulate matter, formed through the incomplete combustion of fossil fuels, biofuel, and biomass.
2. In the tropics, black carbon in soils significantly contributes to soil fertility.
3. Black carbon significantly increases the albedo when deposited on snow and ice.

How many of the above statements is/are correct?

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

Answer: (B)
Explanation: Black carbon (BC) is a component of fine particulate matter. **Black carbon consists of pure carbon in several linked forms. It is formed through the incomplete combustion of fossil fuels, biofuel, and biomass, and is emitted in both anthropogenic and naturally occurring soot.** Black carbon causes human morbidity and premature mortality**. In climatology, black carbon is a climate-forcing agent**. Black carbon warms the Earth by absorbing sunlight and heating the atmosphere and by reducing albedo when deposited on snow and ice. In the tropics, black carbon in soils significantly contributes to fertility as it is able to absorb important plant nutrients. **Hence, statement 3 is not correct.**

93. **Consider the following statements:**
1. Cold-water corals, in general, have a greater amount of zooxanthellae than warm-water corals and do not build reef-like structures.
2. Cold-water corals differ from warm-water corals because the former does not contain symbiotic algae for photosynthesis and grows more slowly.

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: Corals that inhabit the colder deep waters of continental shelves and offshore canyons, ranging from 50 to over 1000m depths lack zooxanthellae and may build reef-like structures or occur solitarily. **Cold-water corals are different from their warm-water counterparts because they do not contain symbiotic algae for photosynthesis and grow more slowly**. Cold-water corals obtain all their energy from organic matter and zooplankton, which they catch from the currents drifting past. **Cold-water corals can be found over a wide range of latitudes, from tropical to Polar Regions, and from the shallow to the deep seas**. **Hence, statement 1 is not correct.**

94. **Lichen is a pioneer species. What do you understand by this statement?**
(a) It contributes substantially to nutrient recycling in the ecosystem.
(b) It can live in inhospitable climatic conditions.
(c) It is generally one of the first species to colonize an ecosystem.
(d) It has the ability to form symbiotic relations with a large number of species.

Answer: (C)
Explanation: Lichens are typically the first organisms to colonize bare rock. They are therefore the pioneer species in primary succession. Many organisms require soil before they can colonize an area. Lichens that colonize bare rock secrete acids that break down the rock and start the soil-production process. **Also, as lichens die, they provide some organic matter that also contributes to soil**. Mosses can then colonize the thin soil; as mosses die, the soil thickens more allowing other hardy species to colonize. The process continues until a mature forest forms, sometimes centuries later. **Hence, statement (c) is correct.**

95. **Consider the following statements regarding Arctic haze:**
1. Arctic haze is the phenomenon of a visible reddish-brown springtime haze in the atmosphere at high latitudes in the Arctic.
2. The occurrence of Arctic haze has been mainly due to cosmic radiation from Van Allen Radiation belts.

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: Arctic haze is the phenomenon of a **visible reddish-brown springtime haze in the atmosphere at high latitudes in the Arctic due to anthropogenic air pollution**. A major distinguishing factor of Arctic haze is the ability of its chemical ingredients to persist in the atmosphere for significantly longer than other pollutants**. Due to limited amounts of snow, rain, or turbulent air to displace pollutants from the polar air mass in spring, Arctic haze can linger for more than a month in the northern atmosphere.** Hence, statement 1 is correct.

96. **Consider the following statements regarding the political organizations during the 19th century in India:**
1. The Bangabhasha Prakasika Sabha was formed by associates of Raja Ram Mohan Roy.
2. Bengal British India Society was set up by Sisir Kumar Ghosh in London.
3. The Indian league was started in Calcutta by Ishwar Chandra Vidyasagar.

How many of the above statements is/are correct?
(a) Only one
(b) Only two

(c) All three
(d) None

Answer: (A)
Explanation: The **Bangabhasha Prakasika Sabha was formed in 1836 by associates of Raja Ram Mohan Roy.** The main aim of the organization was to promote Bengali education by means of polemics and build up public opinion. **On 25 September 1875, the Indian League was founded under the leadership of Sisir Kumar Ghosh. Bengal British India Society was founded in Calcutta in 1843 by William Adam**, a friend of Raja Ram Mohan Roy in England. The Bengal British India Society was an organisation dominated by a section of the Bengal intellectuals, particularly by the young Bengal group. **Hence, only statement 1 is correct.**

97. **The Ahmadabad Mill Strike 1918 led by Gandhiji was based on the issue of:**
(a) Inhuman treatment of mill workers by the management
(b) Objection of management on the participation of workers in the freedom struggle
(c) Plague Bonus of the previous year to workers
(d) Large-scale layoffs of mill workers

Answer: (C)
Explanation: In **March 1918, Gandhi intervened in a dispute between the cotton mill owners of Ahmedabad and the workers over the issue of discontinuation of the plague bonus**. Gandhi asked the workers to go on a strike and demand a 35 per cent increase in wages. Gandhi advised the workers to remain non-violent while on strike. He himself undertook a fast unto death (his first) to strengthen the workers' resolve. The result was that the strike was successful and the workers got a 35% wage increase. **Hence, option (c) is correct.**

98. **Which of the following sites of the Indus Valley Civilization are present in India?**
1. Dholavira
2. Banawali
3. Alamgirpur
4. Mehrgarh

How many of the above options are correct?
(a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (C)
Explanation: Mehrgarh is in Pakistan.
Dholavira is in Gujarat.
Banawali is in Haryana.
Alamgirpur is in Uttar Pradesh.

99. **Consider the following statements regarding the Gandhi-Irwin Pact:**
1. The Gandhi-Irwin Pact was a political agreement signed after the second Round Table Conference in London.
2. It marked the end of a period of civil disobedience (satyagraha) in India against British rule that Gandhi and his followers had initiated with the Salt March.

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: The **'Gandhi – Irwin Pact' was a political agreement signed by Mahatma Gandhi and Lord Irwin, Viceroy of India, on 5 March 1931** before the second Round Table Conference in London. It **marked the end of a period of civil disobedience (Satyagraha)** in India against British rule that Gandhi and his followers had initiated with the Salt March. **Hence, statement 1 is not correct.**

100. **Consider the following with reference to the Bahmani Kingdom.**
1. The Bahamani Sultans were patrons of the Persian language.
2. The Bidri artwork is often associated with this Kingdom.
3. The sultans persecuted Hindus preventing them from taking part in the Bahmani administration or polity.

How many of the above statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: The Bahmani Sultanate was a Muslim state of the Deccan in South India and one of the great medieval Indian kingdoms. It was the **first independent Islamic Kingdom in South India**. Some members of the dynasty became well-versed in the Persian language and composed their literature in the Persian language. **The craftspersons of Bidar then were so famed for their inlay work on copper and silver that it came to be known as Bidri**. The most important step taken by Ahmad Shah was the induction of Hindus into the administration on a large scale. **Hence, statement 3 is not correct.**

101. **Conditions favourable for Delta Formation are:**
1. No strong current running at a right angle to the river mouth.
2. Absence of Continental shelf.
3. The presence of a large lake in the way of the river.
4. The coast should be sheltered preferably without tides.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (B)
Explanation: Conditions favourable for the formation of deltas:
1. **Lateral erosion and vertical erosion** in the upper course of the river provide extensive sediments to be eventually deposited as deltas.
2. The coast should be sheltered and preferably without tides.
3. The **sea should be shallow near the delta region** or else the load will disappear in the deep water.
4. There should not be the presence of large lakes in the river course to filter off the sediments.
5. The currents should be weak and no strong current should run at right angles to the river mouth as it can wash the sediment away. **Hence, statements 1 and 4 are correct.**

102. **Consider the following statements:**
1. Almost all the world's deserts are confined within the 30 to 45-degree parallels of latitude north and south of the equator.
2. Deserts lie in the trade wind belt on the western parts of the continents where Trade winds are off-shore.

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: The pattern that can be identified in the location of the world's deserts is that **almost all the deserts are confined within 15 to 30 degrees parallels of latitude north and south of the equator**. **Hence, statement 1 is not correct.** They lie in the trade wind belt on the western parts of the continents where Trade winds are off-shore. **They are bathed by cold currents which produce a 'desiccating effect' so that moisture is not easily condensed into precipitation.** Dryness or aridity is the keynote. **Such deserts are tropical hot deserts or 'Trade wind deserts'.** They include the Great Sahara Desert; Arabian, Iranian and Thar Deserts; Kalahari, Namib, and Atacama Deserts; the Great Australian Deserts and the deserts of the southwest U.S.A, and northern Mexico. In the continental interiors of the mid-latitudes, deserts such as the **Gobi and Turkestan are characterised by extremes of temperatures**. **Hence, statement 2 is correct.**

103. **Consider the following statements regarding the theory of Plate tectonics:**
1. It is another name for the theory of continental drift.
2. It is the theory that Earth's outer shell is divided into several plates that glide over the mantle.
3. It discards the conventional geological view that there is convectional current flowing in the mantle.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: The plates act like a hard and rigid shell compared to Earth's mantle. This strong outer layer is called the lithosphere. **Plate tectonics is the modern version of continental drift, a theory first proposed by scientist Alfred Wegener in 1912.** Wegener didn't have an explanation for how continents could move around the planet, but researchers do now. **Plate tectonics is thus said to be the unifying theory of geology**. The driving force behind plate tectonics is convection in the mantle. Hot material near Earth's core rises, and colder mantle rock sinks**. In terms of analogy, it is kind of a pot boiling on a stove**. The convection drives plate tectonics through a combination of pushing and spreading apart at mid-ocean ridges and pulling and sinking downwards at subduction zones. **Hence, only statement 2 is correct.**

104. **Consider the following statements:**
1. The expansion created by the "Big Bang" continues even to the present day.
2. After the Big Bang, the Universe became highly opaque and temperatures started rising till the atmosphere was formed.

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 Big Bang Theory considers the following stages in the development of the universe.

(i) In the beginning, **all matter forming the universe existed in one place in the form of a "tiny ball"** (singular atom) with an unimaginably small volume, infinite temperature and infinite density.

(ii) **At the Big Bang the "tiny ball" exploded violently.** This led to a huge expansion. It is now generally accepted that the event of the Big Bang took place 13.7 billion years before the present. **The expansion continues even to the present day.** As it grew, some energy was converted into matter. There was particularly rapid expansion within fractions of a second after the bang. Thereafter, the expansion has slowed down. **Within the first three minutes of the Big Bang event, the first atom began to form.**

(iii) Within 300,000 years from the Big Bang, the temperature dropped to 4,500K (Kelvin) and gave rise to atomic matter. The universe became transparent. **Hence, statement 2 is not correct.**

105. **Which of the following is correct regarding the Profundal zone?**

(a) It is an upper zone of the sea with maximum light penetration.
(b) It is a deep zone of an inland body of freestanding water, located below the range of effective light penetration.
(c)It is a deep zone of the sea located below the range of effective light penetration.
(d) It is an upper zone of the inland body of free-standing water.

Answer: (B)

Explanation: The profundal zone is a **deep zone of an inland body of freestanding water, such as a lake or pond, located below the range of effective light penetration.** This is typically below the thermocline, the vertical zone in the water through which temperature drops rapidly. The profundal is often defined, as the deepest, vegetation-free, and muddy zone of the lacustrine benthal. **The profundal zone is often part of the aphotic zone**. **Hence, option (b) is correct.**

106. **Which of the following is/are included in the calculation of National Income in India?**

1. Salary of employees
2. Exports of the IT sector
3. Sale of Land

How many of the above options are/are correct?

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

Answer: (B)

Explanation:

· National Income is defined as the **total monetary value of all goods and services produced within a country during a given period of time.** Gains on the sale of land will not be included in the estimation of National Income. Capital gains will not be included in the national income as they do not add to the current flow of goods and services in the economy. **Hence, option (3) is not correct.**

107. **Consider the following statements:**

1. The responsibility of conducting monetary policy is explicitly mandated under the Reserve Bank of India Act, 1934.
2. The primary objective of monetary policy is to maintain price stability without worrying about growth.
3. The flexible inflation targeting framework by RBI has a statutory basis.

How many of the above statements is/are correct?

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

Answer: (B)

Explanation: The Reserve Bank of India (RBI) is vested with the responsibility of conducting monetary policy. This responsibility is explicitly mandated under the Reserve Bank of India Act, 1934. **The primary objective of monetary policy is to maintain price stability while keeping in mind the objective of growth.** Price stability is a necessary precondition to sustainable growth. In May 2016, the Reserve Bank of India (RBI) Act, 1934 was amended to provide a statutory basis for the implementation of the flexible inflation targeting framework. **Hence, statement 2 is not correct.**

108. **Consider the following statements regarding RBI's Open Market Operations (OMOs):**

1. OMOs can be used to tame short-term inflation in the economy.
2. They are to be mandatorily conducted once every year to adjust liquidity in the security markets.
3. No intermediaries such as commercial banks are involved in OMOs.

How many of the above statements is/are correct?

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

Answer: (A)

Explanation: OMOs are conducted by the RBI by way of the sale or purchase of government securities (g-secs) to adjust money supply conditions. RBI carries out the OMO through commercial banks and does not directly deal with the public. **The central bank sells g-secs to suck out liquidity from the system and buys back g-secs to infuse liquidity into the system**. These operations are often conducted on a day-to-day basis in a manner that balances inflation while helping banks continue to lend. **The RBI uses OMO along with other monetary policy tools such as repo rate, cash reserve ratio and statutory liquidity ratio to adjust the quantum and price of money in the system**. When the RBI wants to increase the money supply in the economy, it purchases government securities from the market and sells government securities to suck out liquidity from the system. **Hence, only statement 1 is correct.**

109. **Which of the following situations can lead to inflation?**
(a) Sluggish growth of aggregate demand
(b) Higher levels of unemployment
(c) Reduction in the money supply
(d) Rapid growth of aggregate demand outweighing supply

Answer: (D)
Explanation: Demand-pull inflation is a period of inflation that arises from rapid growth in aggregate demand. It occurs when economic growth is too fast. If aggregate demand (AD) rises faster than productive capacity (LRAS), then firms will respond by putting up prices, creating inflation. **Hence, option (d) is correct.**

110. **Consider the following statements:**
1. The Laffer curve is an economic concept that states that inflation and unemployment have a stable and inverse relationship.
2. The Phillips curve is an economic concept developed to show the relationship between tax rates and the amount of tax revenue collected by governments.

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 **Phillips curve is an economic concept developed by A. W. Phillips stating that inflation and unemployment have a stable and inverse relationship**. The Laffer curve is a theory **developed by supply-side economist Arthur Laffer** to show the relationship between tax rates and the amount of tax revenue collected by governments. The curve is used to illustrate Laffer's argument that sometimes cutting tax rates can increase total tax revenue.
Hence, both statements are not correct.

111. **What would happen if the phytoplankton of an ocean is completely destroyed for some reason?**
1. The ocean as a carbon sink would be adversely affected.
2. The density of ocean water would drastically increase.
3. The food chains in the ocean would be adversely affected.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Phytoplanktons are food factories of the ocean, they **fix atmospheric carbon dioxide in large quantities (Carbon Sink) and produce food.** So, if phytoplanktons are removed completely it leads to catastrophic failure of the ocean ecosystem. It doesn't influence the density of ocean water. **Hence, statement 2 is not correct.**

112. **Consider the following:**
1. Blue-green algae
2. Lightning
3. Uptake of soil nutrients by plants
4. Terrestrial Food chain

How many of the above play a role in the Nitrogen cycle on Earth?
(a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (D)
Explanation: Nitrogen is one of the essential constituents of all living organisms as part of proteins, chlorophyll, nucleic acids and vitamins. The atmospheric nitrogen cannot be taken directly by plants and animals. **Certain bacteria and blue-green algae present in the soil fix nitrogen from the atmosphere and convert it into compounds of nitrogen**. Lightning also fixes atmospheric nitrogen. **Nitrogen is one of the essential constituents of all living organisms as part of proteins, chlorophyll, nucleic acids and vitamins**. The atmospheric nitrogen cannot be taken directly by plants and animals. Once nitrogen is converted into these usable compounds, it can be utilised by plants from the soil through their root system. Nitrogen is then used for the synthesis of

plant proteins and other compounds. Animals feeding on plants get these proteins and other nitrogen compounds. **When plants and animals die, bacteria and fungi present in the soil convert the nitrogenous wastes into nitrogenous compounds to be used by plants again.** Certain other bacteria convert some part of them to nitrogen gas which goes back into the atmosphere. As a result, the percentage of nitrogen in the atmosphere remains more or less constant. **Hence, all are correct.**

113. **Which one of the following is the best description of the term 'standing crop'?**
(a) It is the total mass of living material at a particular time in an ecosystem.
(b) It is the total amount of energy produced in a food chain.
(c) It is the amount of biomass of a forest.
(d) It is the number of primary producers in an ecosystem.

Answer: (A)
Explanation: A standing crop is defined as the **total amount or number of living things or of one kind of living thing** (such as an uncut farm crop, the fish in a pond, or organisms in an ecosystem) in a particular area at any given time. **Hence, statement (a) is correct.**

114. **Which of the following shows the symbiotic relationship (partially or fully) between Rhizobium bacteria and the plants they colonise?**
1. Rhizobium bacteria colonize plant cells within root nodules, where they convert nitrous oxide from the soil into ammonia and provide organic nitrogenous compounds to the plants.
2. The plant, in turn, provides the Rhizobium bacteria with organic compounds made using photosynthesis.

Select the correct answer using the code given below:
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (C)
Explanation: Rhizobium is a genus of **Gram-negative soil bacteria that fix nitrogen**. Rhizobium species form an endosymbiotic nitrogen-fixing association with roots of (primarily) legumes and other flowering plants**. Rhizobium forms a symbiotic relationship with certain plants such as legumes, fixing nitrogen from the air into ammonia, which acts as a natural fertilizer for the plants.** The plant, in turn, provides the bacteria with organic compounds made by photosynthesis. This mutually beneficial relationship is true of all of the rhizobia, of which the genus Rhizobium is a typical example. **Hence, both statements are correct.**

115. **Tropics harbour more species than temperate or polar areas. What could be the possible reasons that tropics account for greater biological diversity than temperate regions?**
1. There is more solar energy available in the tropics.
2. Unlike temperate regions which were subjected to frequent glaciations in the past, tropical latitudes have remained relatively undisturbed for millions of years.
3. Tropical environments are less seasonal, relatively more constant and predictable, unlike temperate regions.

Select the correct answer using the code given below:
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (D)
Explanation: What is so special about tropics that might account for their greater biological diversity? **Ecologists and evolutionary biologists have proposed various hypotheses; some important ones are:**
(a) **Speciation is generally a function of time**, unlike temperate regions subjected to frequent glaciations in the past, tropical latitudes have remained relatively undisturbed for millions of years and thus, had a long evolutionary time for species diversification,
(b) **Tropical environments, unlike temperate ones, are less seasonal, relatively more constant and predictable**. Such constant environments promote niche specialisation and lead to greater species diversity and
(c) There is more solar energy available in the tropics, which contributes to higher productivity; this in turn might contribute indirectly to greater diversity.
Hence, all statements are correct.

116. **Consider the following statements:**
1. X-ray fluorescence is commonly used to study the composition of materials in a non-destructive manner.
2. When the sun gives out solar flares, a large amount of X-ray radiation falls on the moon, triggering X-ray fluorescence.

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: Scientists from the Indian Space Research Organisation (ISRO) have mapped out the global distribution of sodium on the Moon's surface. They used the CLASS instrument (Chandrayaan-2 large

area soft X-ray spectrometer) carried by Chandrayaan-2. This is the **first effort to provide a global-scale measurement of sodium on the lunar surface** using X-ray fluorescent spectra. X-ray fluorescence is commonly used to study the composition of materials in a non-destructive manner. When the sun gives out solar flares, a large amount of X-ray radiation falls on the moon, triggering X-ray fluorescence. **Hence, both statements are correct.**

117. **Consider the following statements regarding Hydrogen:**
1. Hydrogen is the lightest and first element on the periodic table.
2. Water is the most abundant compound of hydrogen found on earth.
3. Because of its highly combustible property, Hydrogen as a fuel can be used only in internal combustion engines and not in spacecraft propulsion.

How many of the above statements is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (B)
Explanation: Hydrogen is the lightest and first element on the periodic table. Since the weight of hydrogen is less than air, it rises in the atmosphere and is therefore rarely found in its pure form, H2**. Hydrogen fuel is a zero-emission fuel burned with oxygen**. It can be used in fuel cells or internal combustion engines. **It is also used as a fuel for spacecraft propulsion. It is the most abundant element in the universe**. The sun and other stars are composed largely of hydrogen. Astronomers estimate that 90% of the atoms in the universe are hydrogen atoms. Hydrogen is a component of more compounds than any other element. Water is the most abundant compound of hydrogen found on Earth. **Hence, statement 3 is not correct.**

118. **Consider the following statements regarding Air-independent propulsion:**
1. It is a technology that allows a non-nuclear submarine to operate by using atmospheric oxygen.
2. It is based on the combustion of oxygen and ethanol to augment battery-powered propulsion.
3. The Non-nuclear submarines running on Air-independent propulsion can be virtually silent.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (B)
Explanation: It is a **technology that allows a non-nuclear submarine to operate without the need to access atmospheric oxygen (by surfacing or using a snorkel).** It can augment or replace the diesel-electric propulsion system of non-nuclear vessels. It is **based on the combustion of stored oxygen and ethanol to augment battery-powered propulsion**. AIP significantly improves stealth because it enables a submarine to generate electricity for services and battery charging and propulsion while completely submerged. **AIP systems also generate electricity, powering a submarine to operate and also generating oxygen**, lighting and amenities for the crew. Non-nuclear submarines running on battery power or AIP can be virtually silent. **Hence, statement 1 is not correct.**

119. **Consider the following statements regarding Nuclear Fusion:**
1. Nuclear Fusion reaction is possible at the kind of temperature that exists at the core of the Sun and the stars.
2. The fusion reaction produces almost no carbon emissions and produces much less radioactive waste compared to fission.
3. The only disadvantage of fusion reaction is that the raw materials are not sufficiently available.

How many of the above statements is/are not correct?
(a) Only one
(b) Only two
(c) All three
(d) None

Answer: (A)
Explanation: Nuclear Fusion is possible at very high temperatures, of the order of a few hundred million degrees Celsius, the kind of temperature that exists at the core of the Sun and the stars. Recreating such extreme temperatures is no easy task. The materials that will make up the reactor, too, need to be able to withstand such huge amounts of heat. There are several other complications. **At such high temperatures, matter exists only in the plasma state, where atoms break up into positive and negative ions due to excessive heat. Plasma, which has a tendency to expand very fast, is extremely difficult to handle and work with**. However, the benefits of fusion reactions are immense. Apart from generating much more energy, fusion produces no carbon emissions, the raw materials are in sufficient supply and produces much less radioactive waste compared to fission, and is considered much safer. **Hence, statement 3 is not correct.**

120. **In order to stay over the same location on the Earth, a geostationary satellite must be directly above the:**
(a) Tropic of Cancer
(b) Either North or South Pole
(c) Equator
(d) Tropic of Capricorn

Answer: (C)
Explanation: Most of the communication satellites today are placed in a geostationary orbit. **Geostationary satellites in orbit circle the Earth at the same rate as the Earth spins.** The Earth takes nearly 24 hours to make one full revolution around the Earth allowing them to observe a location constantly on Earth since Earth too rotates at the same speed. So **based on Kepler's Laws of Planetary Motion, this would put the satellite at approximately 35,790 km above the Earth.** The **satellites are located near the equator since at this latitude there is a constant force of gravity from all directions**. At other latitudes, the bulge at the centre of the Earth would pull the satellite down. **Hence, option (c) is correct.**