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1. Economy

- 1) In the context of the new GDP series (Base Year 2022-23) introduced by MoSPI, consider the following statements:
1. The number of price indicators used for inflation adjustment has been tripled compared to the 2011-12 series.
 2. The 'Double Deflation' method ensures that inputs and outputs in manufacturing are deflated separately.
 3. The new series uses old survey data proxies to estimate the activity of the informal sector.

How many of the above statements are correct?

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

Solution: B

- Statements 1 and 2 are correct. Under the new series, MoSPI tripled the price indicators (from ~180 to ~600) to ensure **granular deflation** (Statement 1). The introduction of '**Double Deflation**' for manufacturing and agriculture is a major shift; it deflates inputs and outputs separately to prevent profit fluctuations from raw material costs being miscounted as production growth (Statement 2).
- Statement 3 is incorrect because the new series moves **away from old proxies**. It now uses **actual annual level estimates** from the **Annual Survey of Unincorporated Sector Enterprise (ASUSE)** and the **Periodic Labour Force Survey (PLFS)** to capture the informal sector more accurately.
- Furthermore, it incorporates **Big Data** like GST and e-Vahan to track digital footprints and transport services. This shift to the 2022-23 base year aligns India with the **International System of National Accounts (SNA)** and helps account for the modern gig economy.

- 2) With reference to the Central Public Sector Enterprises (CPSEs) in India, consider the following statements:
1. All CPSEs are mandatory statutory corporations created through specific Acts of Parliament.
 2. The classification of CPSEs into different schedules is primarily used to determine the pay scales of Board-level executives.
 3. A company is classified as a CPSE only if the direct holding of the Central Government is 100%.

How many of the above statements are correct?

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

Solution: A

- Statement 1 is incorrect because CPSEs can be incorporated either under the **Companies Act, 2013** (or the 1956 Act) or created as **Statutory Corporations** through specific Acts of Parliament. They are not "mandatorily" statutory.
- Statement 2 is correct; the Department of Public Enterprises (DPE) classifies entities into Schedules A, B, C, and D to streamline management and determine **Industrial Dearness Allowance (IDA) pay scales** for the Chairman, Managing Director, and Board members.
- Statement 3 is incorrect because a CPSE is defined as a company where the direct holding of the Central Government is **51% or more**, not necessarily 100%. This categorization system was introduced in 1965 to create a hierarchy based on operational size and strategic importance.
- Upgrading an entity like the **National Small Industries Corporation (NSIC)** to Schedule 'A' grants it higher financial and operational autonomy, reflecting its consistent performance and potential to become a global player. This allows the board to take more robust decisions without frequent ministerial intervention.

- 3) Consider the following statements regarding the 'CBDC-based Public Distribution System (PDS)':
1. It utilizes the Digital Rupee issued by the Reserve Bank of India for transactions within the ration distribution mechanism.
 2. The Ministry of Finance is the primary nodal agency for the implementation and oversight of this specific PDS reform.
 3. The system incorporates an automated machine capable of dispensing food grains with high accuracy in a time-bound manner.

How many of the above statements are correct?

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

Solution: B

- Statement 1 is correct as the system integrates **Central Bank Digital Currency (CBDC)**, also known as the **Digital Rupee**, to ensure secure and traceable transactions.
- Statement 2 is **incorrect** because the **Ministry of Consumer Affairs, Food and Public Distribution** is the nodal ministry for PDS reforms, while the RBI acts as the issuer of the currency.
- Statement 3 is correct; the system uses the '**Annapurna**' machine, which can dispense **25 kg of grain in just 35 seconds**, ensuring both speed and precision. This initiative, first launched in **Gandhinagar, Gujarat**, aims to fulfill the vision of "**Minimum Government, Maximum Governance**" by reducing human intervention, preventing leakages, and ensuring that subsidies reach the intended 80 crore beneficiaries transparently.

- 4) With reference to the new Consumer Price Index (CPI) series, consider the following statements:
1. The weight of 'Food and Beverages' has been increased to reflect rising food inflation.
 2. The index now includes prices from online markets and digital services like OTT platforms.
 3. The new series uses the Household Consumption Expenditure Survey (HCES) 2023-24 as its primary data source.

Which of the statements given above is/are correct?

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

Solution: D

- The **Ministry of Statistics and Programme Implementation (MoSPI)** recently updated the CPI series, shifting the base year from 2011-12 to **2023-24**.
- **Statement 1 is incorrect** because the weight of '**Food and Beverages**' has **actually been reduced** from approximately 46% to about **37%**. This reduction is a classic application of **Engel's Law**, which suggests that as household incomes rise, the proportion of income spent on food decreases, even if absolute expenditure increases.
- **Statement 2 is correct** as the new basket is more representative of the **modern digital economy**. It now captures prices for **OTT subscriptions, online airfares, and telecom plans**, and includes data from **12 online markets**.
- **Statement 3 is also correct**; the revision is fundamentally based on the **Household Consumption Expenditure Survey (HCES) 2023-24**, which revealed significant shifts in consumption patterns—moving away from a food-heavy basket toward **housing, transport, and services**. This update makes the CPI a more **credible anchor for monetary policy** and reduces the volatility caused by supply-side food shocks.

- 5) Consider the following statements about the Consumer Price Index (CPI):
1. CPI measures the change in retail prices of a fixed basket of goods and services and serves as India's headline inflation indicator.

2. The field collection of price data is conducted by the National Sample Survey Office (NSSO) under the Ministry of Finance.
3. The new 2024 series includes online prices for flight tickets but excludes regulated prices like railway fares.

How many of the above statements are correct?

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

Solution: A

- CPI is the primary metric for monetary policy in India.
- **Statement 1 is correct**; it tracks the Year-on-Year (YoY) percentage change in the cost of a fixed basket, representing the **headline retail inflation**.
- **Statement 2 is incorrect** because the data is collected by the **Field Operations Division (NSO)** under the **Ministry of Statistics and Programme Implementation (MoSPI)**, not the Ministry of Finance. While MoSPI is the parent ministry, the NSO (National Statistical Office) is the specific executing agency.
- **Statement 3 is incorrect** because, while the 2024 series does include **online prices** (like flight tickets and OTT), it definitely does *not* exclude regulated prices. In fact, it specifically uses **official government data** for railway fares, postal charges, and fuels to ensure precision.
- The inclusion of more services and items (up to 358) reflects the shift in Indian consumption toward service-oriented spending. The transition to the 2024 base year (from 2012) is a structural update that ensures the index remains a reliable gauge for the Reserve Bank of India (RBI) and the government to formulate economic policies in 2026 and beyond.

6) With reference to foreign exchange (forex) reserves, consider the following statements:

1. India's forex reserves include foreign currencies, gold, Special Drawing Rights (SDRs), and the Reserve Tranche Position (RTP) with the IMF.
2. Forex reserves help in stabilizing the Indian rupee and managing exchange rates.
3. A robust forex reserve position enhances India's ability to attract foreign investment and trade.

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

Solution: D

- Forex reserves consist of foreign currency assets, gold, SDRs, and the RTP with the IMF.
- These reserves are crucial for maintaining currency stability and managing the exchange rate of the rupee.
- A strong forex reserve boosts investor confidence, making India more attractive for foreign investment and facilitating international trade.

7) Regarding Urban Co-operative Banks (UCBs), consider the following statements:

1. They operate on the principle of mutual help and local participation.
2. The Banking Regulation (Amendment) Act, 2020 decreased the RBI's powers over UCB governance.
3. UCBs primarily serve small borrowers, traders, and MSMEs in urban areas.

How many of the statements given above are correct?

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

Solution: B

- **Statement 1 is correct**; UCBs are **member-owned** and function on co-operative principles like mutual help and democratic control.
 - **Statement 3 is correct**, as their core mission is providing credit to **MSMEs, small traders, and salaried employees** who may be excluded from mainstream commercial banking.
 - **Statement 2 is incorrect** because the **Banking Regulation (Amendment) Act, 2020** actually **increased and strengthened** the RBI's powers over UCBs, particularly regarding their management, audit, and resolution. This was done to address governance failures and protect depositors' interests. The recent proposal to reopen licensing reflects a shift towards a more **regulated and professionalized** co-operative banking sector.
- 8) With reference to the notification on 'deep tech' start-ups by the DPIIT, consider the following statements:
1. Deep tech start-ups are defined by incremental improvements to existing platform-based technologies.
 2. To be eligible, a start-up's core activity must involve the creation of new scientific or engineering knowledge.
 3. These start-ups are characterized by high technical uncertainty and long gestation periods.

Which of the above statements are correct?

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

Solution: D

- The Centre's formal definition of **deep tech start-ups** marks a shift toward supporting high-end innovation.
 - **Statement 1 is incorrect**; deep tech is specifically distinguished from **incremental or platform-based innovation**. Instead of just making an app better, deep tech seeks to solve fundamental problems using **new scientific discovery**.
 - **Statement 2 is correct**; the core activity must involve the **creation of new knowledge** in science or engineering.
 - **Statement 3 is also correct**; these ventures are defined by **high technical risk, long development timelines**, and the need for **intensive R&D**. Unlike a standard software start-up that might launch in months, a deep tech start-up in **semiconductors, biotech, or quantum computing** might take years to reach the market.
 - The **DPIIT** is the final authority to certify these entities. Eligibility also requires a **major expenditure on R&D** and the **ownership of novel intellectual property (IP)**. These start-ups are prohibited from non-core investments like real estate. By defining this category, the government intends to provide targeted support, such as **patient capital**, to help India compete in global frontier technologies.
- 9) The State Bank of India (SBI) recently launched 'CHAKRA'. Which of the following best describes its purpose?
- (a) A dedicated cell for the recovery of Non-Performing Assets (NPAs) from the textile sector.
 - (b) A global initiative to facilitate cross-border payments in Central Bank Digital Currency (CBDC).
 - (c) A digital platform for the instant disbursement of Mudra loans to MSMEs.
 - (d) A Centre of Excellence to strengthen knowledge-led financing for sunrise sectors.

Solution: D

- **SBI's 'CHAKRA' (Option d)** is a specialized **Centre of Excellence (CoE)** designed to bridge the gap between traditional banking and the complex financing needs of **sunrise sectors**. Sunrise sectors are high-growth industries that are often technology-intensive and capital-heavy, such as Green Hydrogen, Semiconductors, and Electric Mobility.
- The 'CHAKRA' initiative is knowledge-led, meaning it doesn't just provide loans but also conducts deep sectoral research, publishes white papers, and develops advanced risk assessment frameworks tailored to these emerging industries.

- These sectors are expected to require an estimated investment of **₹100 lakh crore by 2030**. By creating CHAKRA, SBI aims to build internal expertise to better evaluate the risks and potentials of technologies like Advanced Cell Chemistry or Smart Infrastructure.
- This allows for the creation of innovative financing models that align with government policies like the PLI schemes, thereby strengthening India's green transition and technological self-reliance.

10) With reference to the decriminalization of tax laws in the New Income Tax Act, 2025, consider the following statements:

1. Failure to get accounts audited is now treated as a technical default and converted into a fee rather than a criminal offence.
2. The maximum imprisonment for tax-related offences has been increased to 10 years to deter large-scale evasion.
3. Penalty proceedings and tax assessments will now be conducted through separate orders to ensure judicial independence.

How many of the above statements are correct?

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

Solution: A

- Statement 1 is correct. The **Income Tax Act, 2025** rationalizes penalties by **decriminalizing technical defaults**. For example, failing to produce books of account or failing to get accounts audited are no longer criminal offences but are handled through **fees**.
- Statement 2 is incorrect; the maximum imprisonment for most tax-related offences has actually been **reduced** from 7 years to **2 years**, and courts have been empowered to convert these sentences into fines.
- Statement 3 is also incorrect. To reduce multiple proceedings and litigation, the new Act introduces **integrated proceedings**. This means that **assessment and penalty proceedings** will be finalized together through a **common order**. This is a major shift aimed at simplifying the tax administration process and reducing the burden on taxpayers. These changes, effective from **April 1, 2026**, emphasize a "trust-based" taxation system, allowing for simplified rules and a redesign of tax forms for ordinary citizens.

2. Ecology and Environment

1) Consider the following species of Macaques and their typical habitats:

Species : Location/Feature

1. Lion-tailed Macaque : Western Ghats, India
2. Crested Black Macaque : Sulawesi, Indonesia
3. Japanese Macaque : Tropical rainforests only

How many of the above pairs are correctly matched?

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

Solution: B

- Pairs 1 and 2 are correctly matched. The **Lion-tailed Macaque** is an endangered species endemic to the Western Ghats of Southern India, easily identified by its silver mane. The **Crested Black Macaque** is native to the Indonesian island of Sulawesi.

- Pair 3 is incorrect; **Japanese Macaques** (Snow Monkeys) are famous for living in **cold climates** and soaking in hot springs, not just tropical rainforests. In fact, macaques as a genus are highly adaptable and can be found in rocky cliffs, urban plains, and high-altitude mountains. They are robust primates with arms and legs of equal length and possess dog-like muzzles.
 - One of their most distinctive social traits is their reliance on **physical touch** for emotional regulation; young macaques abandoned by their mothers often seek comfort from surrogate objects to maintain emotional stability, as seen in the viral case of the baby macaque 'Punch.'
- 2) With reference to the "Hibernation" cycle disrupted in Uttarakhand in early 2026, consider the following statements:
1. Low snowfall prevents the metabolic trigger required for bears to enter a state of dormancy.
 2. Bears undergoing hibernation consume stored fat reserves, including brown fat, to generate heat.
 3. Hibernation is a strategy to conserve energy specifically during periods of extreme heat and water scarcity.
 4. Increased bear attacks in early 2026 are linked to the bears remaining active during their traditional hibernation period.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: C

- **Statement 1 is correct**; environmental conditions like consistent cold and snowfall are triggers for bears to retreat and start their metabolic slowdown.
- **Statement 2 is correct**; fat accumulation is the fuel for hibernation. **Brown fat** is particularly important for thermogenesis (heat production) during brief periods of arousal.
- **Statement 3 is incorrect** because hibernation is a winter strategy for **cold and food scarcity**. A similar state for heat and water scarcity is called *aestivation*, which is common in some reptiles and amphibians, but not the primary driver for Himalayan bears.
- **Statement 4 is correct**. Because the bears did not enter a proper state of dormancy due to low snowfall, they remained active in search of food. This increased activity in areas where they would usually be hidden away led to a rise in **human-wildlife conflict**. The disruption of these natural cycles is a clear indicator of how climate change impacts biodiversity and human safety. Protecting these species requires not just habitat preservation but also maintaining the **environmental triggers** like snowfall that regulate their natural behavior.

3) Consider the following statements:

Statement-I: Carbon Capture and Utilisation (CCU) provides a potential revenue stream that can offset the high costs associated with carbon capture.

Statement-II: Unlike pure Carbon Capture and Storage (CCS), CCU transforms CO₂ into marketable products like urea, synthetic fuels, and building materials.

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

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

Solution: A

- Statement-I highlights the **economic viability** of CCU. One of the biggest hurdles for decarbonization is the prohibitive cost of capture technologies. CCU addresses this by treating CO₂ as a **feedstock** rather than a waste product.

Statement-II is correct and provides the direct explanation for Statement-I. By converting CO₂ into valuable commodities—such as **urea** for fertilizers, **methanol** for aviation, or **carbonates** for green concrete—industries can generate sales revenue. This creates a financial incentive that **CCS (Storage)** lacks, as storage is purely a cost-center involving injection into saline aquifers or depleted oil fields. The "utilisation" aspect transforms an environmental liability into an industrial asset, fostering a **circular carbon economy**. This capability is particularly vital for sectors that are hard to abate, allowing them to retrofit existing plants and extend the life of industrial assets while moving toward **Net Zero** targets.

4) Consider the following statements regarding Project Tiger:

1. It is a Centrally Sponsored Scheme implemented through the core–buffer strategy.
2. The National Tiger Conservation Authority (NTCA) is a statutory body established under the Environment (Protection) Act, 1986.
3. The buffer area of a tiger reserve is an inviolate space with the legal status of a National Park or Sanctuary.

How many of the above statements are correct?

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

Solution: A

- **Statement 1 is correct.** Project Tiger, launched in 1973, is a **Centrally Sponsored Scheme** aimed at tiger conservation. It utilizes a **core–buffer strategy**, where the core area is kept as an undisturbed habitat and the buffer area allows for human-wildlife coexistence.
- **Statement 2 is incorrect.** While the National Tiger Conservation Authority (NTCA) is a statutory body, it functions under the **Wildlife Protection Act, 1972**, not the Environment (Protection) Act, 1986. Its primary role is to provide statutory backing to tiger conservation and oversee the implementation of Project Tiger.
- **Statement 3 is incorrect.** According to the core–buffer strategy, it is the **Core area** that has the legal status of a National Park or Sanctuary and is intended to be kept **inviolate** (free from human disturbance). The **Buffer area**, on the other hand, consists of multiple-use landscapes where people-oriented development and livelihood activities are permitted alongside conservation goals.

5) Consider the following statements regarding Tiger Reserves in India:

1. Critical Tiger Habitat (CTH) is legally inviolate and free from human habitation.
2. The declaration of a Tiger Reserve makes the area a 'no-go' zone, permanently prohibiting any human presence, including indigenous communities.
3. The core and buffer zones of Tiger Reserves are defined under the Wildlife Protection Act, 1972.

How many of the above statements is/are incorrect?

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

Solution: A

Statement 1 is correct – **Critical Tiger Habitat (CTH)** is legally inviolate and set aside for tiger conservation.

Statement 2 is incorrect – While **relocation of human settlements from core zones is encouraged**, traditional rights of forest dwellers are recognized under the **Forest Rights Act (2006)**, and they can co-exist in buffer zones.

Statement 3 is correct – The **Wildlife Protection Act, 1972** defines core and buffer zones in Tiger Reserves.

What is a [Tiger Reserve](#)?

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- A **Tiger Reserve** is a protected area meant for the conservation of **Bengal tigers** and their ecosystem.
 - It falls under **Project Tiger (1973)**, a centrally sponsored scheme by the **National Tiger Conservation Authority (NTCA)**.
 - These reserves ensure **tiger population growth, habitat conservation, and human-wildlife conflict mitigation**.
- 6) Which of the following best explains the ecological significance of Satkosia Tiger Reserve?
- (a) It acts as a transitional zone between the Eastern Ghats and Deccan Plateau, supporting a unique blend of biodiversity.
 - (b) Satkosia Tiger Reserve is a completely uninhabited protected area, ensuring minimal human-wildlife conflict.
 - (c) It was the first Tiger Reserve in India to successfully reintroduce tigers from another state under Project Tiger.
 - (d) It is located at the confluence of the Mahanadi and Godavari rivers, making it one of India's largest riparian tiger reserves.

Solution: A

Satkosia Tiger Reserve serves as a transitional zone between the Eastern Ghats and the Deccan Plateau, making it ecologically unique.

- **Option b is incorrect** because there are **234 villages in the impact zone**, leading to significant **human-wildlife conflicts**.
- **Option c is incorrect** because the tiger reintroduction project at **Satkosia failed** due to poaching and mismanagement.
- **Option d is incorrect** because Satkosia is located along the **Mahanadi River**, but **not at the confluence of Mahanadi and Godavari**.

About [Satkosia Tiger Reserve](#):

- **Location:** Spans **Angul, Cuttack, Boudh, and Nayagarh districts** in Odisha.
- **Established:** **2007**, by merging **Satkosia Gorge Sanctuary (1976)** and **Baisipali Wildlife Sanctuary (1981)**.
- **Total Area:** **1,136.70 sq. km**.
- **Geographical Significance:** A **transitional zone** between **Eastern Ghats and Deccan Plateau**, promoting rich biodiversity.
- **Fauna:** Previously home to **12 tigers (2007)**, but the **2022 census found none**; shelters **elephants, leopards, mugger crocodiles, wild dogs, and 200+ bird species**.
- **Flora:** Houses **400+ plant species**, including **Sal, Mahua, Bamboo, and medicinal plants**.
- **Ramsar Site:** Recognized as a **wetland of international importance**.
- **Tiger Reintroduction:** Initiated in **2018** with two tigers from Madhya Pradesh; **failed due to poaching and mismanagement**.
- **Human Settlements:** **234 villages in the surrounding impact zone**, creating **conflicts over land and resources**.

- 7) Which of the following are objectives of the CAMPA funds?
1. Treatment of catchment areas
 2. Assisted natural regeneration
 3. Urban infrastructure development
 4. Managing human-wildlife conflicts

Select the correct answer using the code below:

- (a) 1, 2, 3, and 4
- (b) 1, 2, and 4 only
- (c) 2, 3, and 4 only
- (d) 1, 2, and 3 only

Solution: B

Objectives of CAMPA funds include the treatment of catchment areas, assisted natural regeneration, and managing human-wildlife conflicts. **Urban infrastructure development is not among the specified objectives of CAMPA funds.**

What is **CAMPA**?

- **Compensatory Afforestation Fund Management and Planning Authority (CAMPA)** is a mechanism for **afforestation and forest conservation** to compensate for the **diversion of forest land** for non-forest purposes.
- Established by the **Supreme Court in 2009**, it operates at both **national and state levels**.

Objectives of CAMPA

- **Compensate forest loss** by promoting afforestation and natural regeneration.
- **Ensure effective fund utilization** for forest and wildlife conservation.
- **Provide financial support** for forest protection, research, and training.
- **Strengthen institutions** responsible for forest management.

Provisions Under CAMPA

- **Funds Collection:** Money is collected from **project proponents** seeking forest clearance under the **Forest (Conservation) Act, 1980**.
- **Utilization of Funds:** Used for **compensatory afforestation, additional afforestation, penal compensatory afforestation, and wildlife conservation**.
- **State CAMPA:** Receives funds from the **Adhoc CAMPA** and administers their utilization for forest development.
- **Monitoring & Accountability:** An independent system is set up for concurrent monitoring and evaluation.

8) Consider the following statements regarding Listeria.

1. Listeria is a bacteria that can lead to an infection called listeriosis.
2. It is found in soil, vegetation, water and even the faeces of animals and humans.
3. Most people who ingest listeria-infected food will fall sick or develop symptoms immediately.

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

Solution: A

Listeria or Listeria monocytogenes is a type of bacteria found in soil, vegetation, water, sewage and even the faeces of animals and humans. Listeria-contaminated food can lead to an infection called listeriosis.

Most people who ingest listeria-infected food do not fall sick or develop symptoms. The bacteria can be present in the infected person's system for up to two months until the symptoms present themselves, making it difficult to establish the connection between what was consumed and the infection.

Symptoms include vomiting, nausea, cramps, severe headache, constipation and fever.

People with compromised immune systems, pregnant persons and their offspring and the elderly (aged 65 and above) are vulnerable.

9) "Arribada," a term often associated with conservation efforts in Odisha, refers to:

- (a) The unique courtship display of the Indian Peacock.
- (b) The seasonal migration of species to high-altitude Himalayan regions.
- (c) The mass nesting behavior of Olive Ridley sea turtles.
- (d) The controlled combustion process in air-breathing ramjet engines.

Solution: C

Arribada is a Spanish word meaning "arrival." In the context of marine biology and Indian environment news, it refers to the **synchronized mass nesting** of thousands of **Olive Ridley sea turtles**.

- The 'turtle trails' mentioned in the Union Budget are designed around these Arribada sites.
- **Odisha's Significance:** The state hosts the most spectacular Arribadas in the world at **Gahirmatha and Rushikulya**.
- **Conservation:** During this time, thousands of females come ashore simultaneously to lay eggs. This behavior is a survival strategy to overwhelm predators. The proposed **Turtle Trails** in Odisha, Karnataka, and Kerala aim to allow people to witness this phenomenon without causing the **light pollution or physical disturbance** that often leads to the death of hatchlings or the abandonment of nesting attempts by the mothers.

10) With reference to the 'Smooth-coated Otter', consider the following statements:

1. It is the smallest otter species found in Asia.
2. It is listed as 'Vulnerable' on the IUCN Red List.
3. The presence of these otters is considered a bio-indicator of a healthy aquatic ecosystem.

How many of the above statements are incorrect?

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

Solution: A

- Statement 1 is incorrect. The smooth-coated otter (*Lutrogale perspicillata*) is actually **one of the largest** otter species in Asia, reaching lengths of up to 1.3 meters. The "Small-clawed otter" is the smallest.
- Statement 2 is correct; it is categorized as **Vulnerable** due to habitat loss and pollution.
- Statement 3 is correct. As apex predators in freshwater systems, otters are highly sensitive to water quality and fish availability. Their presence in the **Nandhaur Wildlife Sanctuary** (recorded recently for the first time) indicates that the river systems there are clean and provide a robust prey base of fish and amphibians.

11) Consider the following objectives of 'Turtle Trails', proposed in Union Budget for 2026-27.

1. Promotion of sustainable eco-tourism.
2. Generation of livelihoods for coastal communities.
3. Establishing large-scale permanent concrete hotels on nesting beaches.
4. Scientific management of public access to sensitive biodiversity zones.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: C

- **Objective 1 is correct.** The core idea of 'Turtle Trails' is to promote **sustainable eco-tourism**. By regulating how people visit these areas, the project ensures that tourism does not harm the very species people are coming to see.
- **Objective 2 is correct.** The initiative is tied to **livelihood generation**. By training locals to be guides and conservation volunteers, it provides an economic incentive for communities in Odisha, Karnataka, and Kerala to protect the turtles.
- **Objective 3 is incorrect.** The project emphasizes **low-impact infrastructure**. Building permanent concrete hotels on nesting beaches would be ecologically disastrous, as it would cause **light pollution** (which disorients hatchlings) and destroy nesting sites. Instead, the proposal suggests **temporary or eco-friendly observation zones**.

- **Objective 4 is correct.** Currently, many nesting sites face **unregulated tourism**, which can be chaotic and harmful. 'Turtle Trails' aims for **scientific management**, where public access is guided and restricted to certain times and areas, ensuring that the **Olive Ridley nesting cycle** (Arribada) is not disturbed. This integrated approach aligns with India's goal of becoming a leader in **nature-based tourism** while fulfilling its conservation commitments.

12) Consider the following statements:

Statement I: Recent sightings of peacocks at an altitude of over 6,000 feet in the Himalayas are considered a signal of ecosystem stress.

Statement II: Peacocks are highly sensitive to temperature changes and their movement to higher altitudes suggests a shift in species distribution due to global warming.

Statement III: The Indian Peacock is the only species of peafowl that is not classified as 'Least Concern' by the IUCN.

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

- Both Statement II and Statement III are correct and both of them explain Statement I
- Both Statement II and Statement III are correct but only one of them explains Statement I
- Only one of the Statements II and III is correct and that explains Statement I
- Neither Statement II nor Statement III is correct

Solution: C

- **Statement I is correct** (as per the context of the question). The appearance of peacocks at high altitudes like Manali is ecologically significant. It indicates that the **Himalayan ecosystem** is undergoing changes, likely due to rising temperatures, which allows species typically restricted to warmer plains to survive at higher elevations. This is a clear **signal of ecosystem stress** and shifting biodiversity patterns.
- **Statement II is correct.** Peacocks are indeed sensitive to climate, and their **altitudinal shift** is a classic biological response to global warming. As lower regions become too hot or as higher regions become warmer and more hospitable, species "migrate" upwards. This statement directly explains why the sightings in Statement I are occurring.
- **Statement III is incorrect.** The Indian Peacock (*Pavo cristatus*) is classified as '**Least Concern**'. It is the **other** species, like the Green Peacock (Endangered) and the Congo Peacock (Vulnerable), that have higher threat statuses. Therefore, Statement III is false.
- Since only Statement II is correct and it provides the scientific explanation for the phenomenon described in Statement I, the correct answer is **(c)**. This type of species movement is a major concern for conservationists as it may lead to **new human-wildlife conflicts** and competition with native high-altitude species that are not adapted to the presence of peacocks.

13) Consider the following statements regarding the conservation status and threats to the Great Indian Bustard:

- The Great Indian Bustard is listed under Appendix II of CITES.
- The primary threats to its survival include habitat destruction, power line collisions, and human interference.
- It is included under Schedule II of the Wildlife Protection Act, 1972, in India.

How many of the above statements is/are incorrect?

- Only one
- Only two
- All three
- None

Solution: B

Statement 1 is incorrect. The Great Indian Bustard is listed under **Appendix I of CITES**, which provides the highest level of protection for endangered species in international trade.

Statement 2 is correct. Major threats to the Great Indian Bustard include habitat destruction, collisions with power lines, and human interference, all of which have drastically reduced its population.

Statement 3 is incorrect. The species is protected under **Schedule I of the Wildlife Protection Act, 1972**, which ensures maximum protection under Indian law.

14) Consider the following statements regarding the distribution and lifestyle of the Indian flapshell turtle:

1. The Indian flapshell turtle is found across South Asia, including countries like Pakistan, Sri Lanka, and Bangladesh.
2. This species is omnivorous, feeding on a variety of plants, insects, and small animals.
3. It is well adapted to drought conditions and can survive in low-water environments.

How many of the above statements is/are correct?

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

Solution: C

Statement 1 is correct. **The Indian flapshell turtle has a wide distribution across South Asia, including India, Pakistan, Sri Lanka, Nepal, Bangladesh, and Myanmar.**

Statement 2 is correct. The species is omnivorous, consuming plants, insects, small fish, and other small animals.

Statement 3 is correct. The Indian flapshell turtle has evolved to survive in drought-prone areas and can live in low-water or even dried-out conditions.

15) With reference to the Indian Peacock (*Pavo cristatus*), which of the following is correct?

- (a) It is classified as 'Endangered' on the IUCN Red List.
- (b) It is naturally found in high-altitude alpine meadows above 5,000 metres.
- (c) The males possess a long iridescent train used for courtship displays.
- (d) They are primary carnivores, feeding solely on small mammals.

Solution: C

- The **Indian Peacock (*Pavo cristatus*)** is one of the most recognizable birds in the world and serves as the **National Bird of India**.
- Option (c) is correct as the most striking feature of the male peacock is its **long iridescent train**, which can consist of over 200 elongated feathers adorned with colorful "eye-spots." This train is fanned out in a spectacular display during the breeding season to attract females (peahens).
- **Option (a) is incorrect** because the Indian Peacock is classified as '**Least Concern**' on the IUCN Red List, reflecting its widespread population and adaptability. In contrast, the Green (Javanese) Peacock is 'Endangered'.
- **Option (b) is incorrect** regarding its natural habitat. Peacocks are typically birds of **lowlands and plains**, usually found in semi-arid to moist deciduous forests and agricultural landscapes. Their typical altitudinal range is up to **1,000 to 1,500 metres**. Recent sightings at **6,000 feet (1,800m)** in Himachal Pradesh are considered ecologically unusual and are being studied as potential **indicators of climate change**.
- **Option (d) is incorrect** because peacocks are **omnivorous**. Their diet is diverse, including seeds, fruits, insects, and even small reptiles like snakes. This makes them beneficial for **pest control** in agricultural areas. They are primarily ground-dwelling birds but are capable of short flights and typically **roost in trees** at night for protection from predators. Their presence at higher altitudes suggests that warming temperatures are making previously colder regions more habitable for them.

16) With reference to the Loggerhead Turtles (*Caretta caretta*), consider the following statements:

1. They are primarily found in the Arctic and Antarctic oceans due to their preference for cold-water environments.

2. They are classified as "Critically Endangered" under the IUCN Red List of Threatened Species.
3. They are purely herbivorous, feeding primarily on seagrasses and algae throughout their lifespan.

How many of the above statements are correct?

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

Solution: D

- **Statement 1 is incorrect** because Loggerhead turtles are distributed globally in **temperate and subtropical** oceans, including the Atlantic, Pacific, and Indian Oceans; they do not inhabit the polar regions.
- **Statement 2 is incorrect** as their IUCN status is **Vulnerable**, not Critically Endangered. While they face threats, they are more widely distributed than species like the Hawksbill turtle.
- **Statement 3 is incorrect** because Loggerheads are known for their **large heads and powerful jaws**, which are an evolutionary adaptation for a **carnivorous/omnivorous** diet. They feed on hard-shelled prey such as mollusks, crustaceans, and crabs, acting as key regulators of the marine food web.
- Recent studies in 2026 have highlighted that these turtles are **shrinking in size** and producing fewer eggs due to warming oceans and declining marine productivity. This makes them vital **indicator species** for ocean health.

17) Consider the following statements regarding 'Bio-based Chemicals':

1. Lactic acid and bio-alcohols are examples of organic intermediates produced via fermentation.
2. These chemicals are primarily used as substitutes for metals in heavy industrial manufacturing.
3. Microbial fermentation is a common process used for the formation of these chemicals.

How many of the above statements are correct?

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

Solution: B

- Statement 1 is correct; **lactic acid** and **bio-alcohols** are classic examples of bio-based chemicals derived from biomass through biological processes.
- Statement 2 is **incorrect** because these chemicals are substitutes for **petrochemicals** (derivatives of oil and gas), not metals. They are used in plastics, solvents, and pharmaceuticals.
- Statement 3 is correct; **microbial fermentation** and enzymatic conversion are the primary methods for transforming raw biomass (like corn or starch) into these useful chemical intermediates. By shifting to these methods, industries can move toward a **bioeconomy**, which integrates biology with industrial production to create sustainable, **biodegradable**, and carbon-neutral products that reduce the global reliance on fossil fuels.

18) With reference to 'Bio-based Chemicals and Enzymes', consider the following statements:

1. Bio-based chemicals are derived from fossil hydrocarbons but processed using biological catalysts.
2. Enzymes are biological catalysts that typically require higher temperatures and pressures compared to traditional chemical catalysts.
3. The production of bio-based chemicals generally results in a lower carbon footprint compared to petrochemical pathways.
4. India's BioE3 policy prioritizes these substances to reduce dependence on petrochemical imports.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: B

- Statement 1 is **incorrect** because bio-based chemicals are derived from **renewable biological feedstocks** (like sugarcane or agricultural residues), not fossil hydrocarbons.
- Statement 2 is **incorrect** because one of the primary advantages of enzymes is that they operate at **lower temperatures and pressures**, making them more **energy-efficient** than traditional industrial catalysts.
- Statement 3 is correct as the use of biomass and efficient enzymatic processes leads to significantly lower **greenhouse gas emissions**.
- Statement 4 is correct; the **BioE3 policy** (Economy, Environment, and Employment) by the Department of Biotechnology specifically targets these sectors to foster sustainable manufacturing and enhance India's **self-reliance** by cutting down on expensive and environmentally taxing petrochemical imports.

19) The famous black sand of Reynisfjara Beach in Iceland owes its unique color primarily to:

- (a) Large deposits of coal near the shoreline
- (b) Pulverized basaltic lava from volcanic eruptions
- (c) Industrial pollution from nearby factories
- (d) Decomposed organic matter from deep-sea forests

Solution: B

- Reynisfjara is world-renowned for its **black volcanic sand**. This sand is not organic; it is geological. It was formed from **basaltic lava** that flowed from nearby volcanoes (such as Eyjafjallajökull) and hit the cold Atlantic Ocean. The rapid cooling caused the lava to shatter into tiny fragments, which the powerful waves then ground down into sand over centuries.
- The beach is a part of the **Katla UNESCO Global Geopark**, emphasizing its volcanic heritage. Besides the sand, the beach is famous for its **hexagonal basalt columns**, which were formed by a process called **columnar jointing** as thick lava cooled slowly.
- Recently, the beach has faced significant erosion due to changing wind patterns and high-energy **"sneaker waves."** Because the sand is a product of specific volcanic events, it is not easily replenished, making the current erosion a serious concern for the preservation of this iconic natural landmark.

20) The Sangtam community, which recently made news for its resolution to protect pangolins, is a recognized tribe of which Indian state?

- (a) Arunachal Pradesh
- (b) Manipur
- (c) Nagaland
- (d) Mizoram

Solution: C

- The **Sangtam Naga** are one of the major recognized tribes of **Nagaland**. They primarily reside in the eastern part of the state, specifically in the **Kiphire and Tuensang** districts. This community is known for its strong **traditional governance systems**, where village councils and tribal apex bodies make binding decisions for the community.
- The recent resolution to protect **pangolins** is significant because the Sangtam region is located near the **India-Myanmar border**, which is a known route for illegal wildlife trafficking. By taking a collective stand, the community has demonstrated the power of **indigenous-led conservation**.
- In many parts of Northeast India, community land ownership means that the state's environmental laws are most effective when supported by local tribal resolutions. This move by the Sangtam community sets a precedent for other tribes to use their customary authority to safeguard endangered biodiversity.

21) With reference to the recently discovered Army Ant species, consider the following statements:

1. The new species, *Aenictus chittoorensis*, was discovered in the Western Ghats of Karnataka.

2. Army ants are nomadic predators that do not build permanent nests, instead forming 'bivouacs'.
3. These ants are completely blind and rely on chemical pheromone trails for navigation.

How many of the above statements are incorrect?

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

Solution: A

- **Statement 1 is incorrect** because while the scientists involved were from Karnataka and Odisha, the discovery of **Aenictus chittoorensis** and **Aenictus lankamallensis** took place in the **Eastern Ghats of Andhra Pradesh**, specifically within the **Sri Venkateswara Wildlife Sanctuary**.
- **Statement 2 is correct**; army ants are famous for their **nomadic lifestyle**. Unlike typical ants that build underground nests, army ants form **bivouacs**—temporary structures made entirely of the living bodies of the ants themselves, clinging together to protect the queen and the larvae.
- **Statement 3 is also correct**; these predators are **completely blind**. They have evolved to hunt in highly coordinated mass raids by using **pheromones**. These chemical trails allow thousands of individuals to move as a single, synchronized unit, often in straight columns.
- They are considered **keystone predators** in tropical forest ecosystems because they regulate arthropod populations. Their aggressive raids also flush out other insects, which then become food for birds and reptiles, thus supporting a complex food web. Their discovery in the Eastern Ghats highlights the hidden biodiversity of this often-overlooked mountain range compared to the Western Ghats.

22) Which of the following best describes "Engel's Law" in the context of India's revised CPI weights?

- (a) As income increases, the absolute amount spent on food increases at a faster rate than income.
- (b) As income increases, the percentage of income spent on food decreases.
- (c) As inflation rises, the demand for luxury goods increases proportionally.
- (d) Lower food prices lead to an increase in the consumption of cereal-based products.

Solution: B

- **Engel's Law** is an economic theory stating that as a household's **income increases**, the **percentage of income spent on food decreases**, even if the total amount spent on food increases. This is because food is a necessity with low income elasticity once basic needs are met. In the context of India's **new CPI series (Base 2023-24)**, this law explains why the **weight of Food and Beverages** was cut from ~46% to ~37%.
- As the Indian economy has grown since 2011-12, average household consumption has shifted. People are now spending a larger share of their budget on **non-food items** such as **housing, education, health, and digital services**. By reducing the weight of food, the new CPI becomes less sensitive to **weather-driven fluctuations** in vegetable or cereal prices, providing a clearer picture of **core inflation**. T

23) Consider the following statements:

Statement I: Arctic amplification is a significant factor in the increasing instability of the polar vortex.

Statement II: Faster warming of the Arctic reduces the temperature gradient between the pole and lower latitudes.

Statement III: A reduced temperature gradient strengthens the jet stream, preventing cold air from moving south.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Solution: C

- **Statement I is correct;** Arctic amplification (the Arctic warming faster than the rest of the globe) destabilizes the polar vortex.
- **Statement II is also correct** and provides the mechanism: the **reduced temperature gradient** between the cold pole and warmer mid-latitudes weakens the atmospheric forces that keep the vortex stable.
- However, **Statement III is incorrect** because a reduced temperature gradient actually **weakens** the jet stream (not strengthens it), making it wavy and prone to meandering.
- Since Statement II is correct and explains why the instability mentioned in Statement I occurs, while Statement III is false, option (c) is the correct answer.
- This atmospheric shift leads to **increased weather volatility**, causing extreme winter storms even as global average temperatures rise.

24) Which of the following statements best describes the principle of 'Common but Differentiated Responsibilities' (CBDR)?

- Developing countries are exempt from any responsibility for environmental protection.
- The responsibility for environmental protection is solely based on a country's current level of emissions.
- All countries are equally responsible for environmental degradation and must contribute equally to its mitigation.
- Developed countries have a greater historical responsibility for environmental damage and should therefore bear a greater share of the burden in addressing it.

Solution: D

The principle of **Common but Differentiated Responsibilities (CBDR)** is a cornerstone of international environmental law and was formally enshrined in the Rio Declaration on Environment and Development in 1992.

- The principle acknowledges that while the responsibility for protecting the global environment is **common** to all countries, the specific obligations and the extent of these responsibilities should be **differentiated**.
- This differentiation is based on two main factors: the **historical contribution** of a country to the environmental problem (particularly climate change) and its **financial and technological capacity** to address it.
- Developed countries, having contributed the most to the accumulation of greenhouse gases in the atmosphere since the industrial revolution, are considered to have a greater historical responsibility. They also possess greater resources to invest in mitigation and adaptation measures.

25) Which country recently proposed the first Reading of the 'Antarctic Activities and Environmental Protection Law' to its national legislature?

- Russia
- India
- China
- Australia

Solution: C

- The government of **China** submitted the draft **Antarctic Activities and Environmental Protection Law** to the National People's Congress (NPC) Standing Committee in December 2025. This legislative move is intended to provide a comprehensive **binding legal framework** for all Chinese engagement in Antarctica. It shifts the management of polar activities from simple policy guidelines to formal domestic law. The law is particularly significant given China's expanding interests in **Antarctic tourism and shipping**. By regulating these activities domestically, China aims to demonstrate its commitment to the **Antarctic Treaty System** and peaceful environmental protection while asserting its role in global governance.

26) With reference to "Lyriothemis keralensis", a species recently discovered in Kerala, consider the following statements:

- It is a species of dragonfly endemic to the Western Ghats.

2. It displays sexual dimorphism, with males being blood-red and females being yellow.
3. The species is unique because its entire life cycle, including the larval stage, is spent in rubber plantations.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is correct.** *Lyriothemis keralensis* is a newly described **dragonfly species** (Odonata) that is **endemic to Kerala**, specifically within the Western Ghats biodiversity hotspot.
- **Statement 2 is correct.** The species shows clear **sexual dimorphism**: males are a striking **blood-red** with black markings, while females are **yellow** with black markings.
- **Statement 3 is incorrect.** While the adults are found in shaded rubber and pineapple plantations, their life cycle is not restricted to these terrestrial areas. Like other dragonflies, they have an **aquatic larval stage**. The adults are only visible during the **Southwest monsoon** (May–August), while the rest of the year is spent as larvae in vegetated pools or irrigation canals.
- This discovery is significant as it demonstrates how **human-modified landscapes** can still support unique, undiscovered biodiversity, although it raises concerns since these areas often lack formal protection.

27) With reference to the Mangrove clam (*Geloina erosa*), consider the following statements:

1. It is a large-sized bivalve primarily found in the organic-rich muddy substrates of intertidal mangrove zones.
2. It is a stenohaline species that can only survive in high-salinity marine environments.
3. Its burrowing behaviour contributes to ecosystem resilience by enhancing nutrient cycling and stabilizing sediments.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is correct.** *Geloina erosa*, commonly known as the mud clam or "Kandal Kakka," is one of the world's largest mangrove clams, reaching up to 10 cm in shell width. It thrives in the **intertidal zones of mangrove and estuarine ecosystems** across South and Southeast Asia.
- **Statement 2 is incorrect.** The species is known for its ability to tolerate a **wide salinity range**, from brackish water to near-freshwater environments, making it a euryhaline rather than a stenohaline species.
- **Statement 3 is correct.** These clams are **ecosystem stabilizers**. As deep-burrowing, semi-infaunal organisms, they play a crucial role in **recycling nutrients** and improving water quality through filter-feeding. Their presence strengthens the benthic-mangrove linkage, making the ecosystem more resilient to environmental changes.
- The ICAR-CMFRI's recent success in **induced breeding** of this species is a significant scientific milestone for estuarine aquaculture and mangrove restoration.

28) Consider the following statements about the Mithi River:

1. It is a perennial river that originates from the overflow of Vihar Lake and Powai Lake.
2. The river flows through the heart of Mumbai and empties into the Arabian Sea at Mahim Creek.
3. Due to extensive conservation efforts, the river is now one of the cleanest urban rivers in India.

How many of the above statements are incorrect?

- (a) Only one

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

Solution: B

- **Statement 1 is incorrect.** The Mithi River is a **seasonal river**, not a perennial one. Its flow is largely dependent on monsoon rains and the overflow from Vihar and Powai lakes.
- **Statement 2 is correct.** The river's course takes it through several prominent suburbs of Mumbai, and it ultimately **drains into the Arabian Sea at Mahim Creek.**
- **Statement 3 is incorrect.** The Mithi River is **highly polluted** due to the discharge of untreated sewage, industrial effluents, and the dumping of solid waste. Encroachments along its banks have further degraded the river and reduced its carrying capacity, making the surrounding areas vulnerable to flooding during heavy rainfall. While there have been efforts to clean up the river, it remains a significant environmental challenge for the city of Mumbai.

29) Match the following:

List I (Term)	List II (Description)
A. Surfactant	1. A substance that increases the cleaning efficiency of detergents in hard water
B. Builder	2. A chemical that helps to break down stains caused by proteins
C. Enzyme	3. A compound that reduces the surface tension of water, allowing it to wet surfaces more effectively

Select the correct answer code:

- (a) 2 A-3, B-2, C-1
- (b) A-1, B-3, C-2
- (c) A-2, B-1, C-3
- (d) A-3, B-1, C-

Solution: D

- **Surfactant (A)** is correctly matched with description 3. Surfactants (surface-active agents) are the primary cleaning agents in detergents. They have a molecular structure with a hydrophilic (water-attracting) head and a hydrophobic (water-repelling) tail. This allows them to **reduce the surface tension of water** and help in the removal of dirt and grease.
- **Builder (B)** is correctly matched with description 1. Builders are added to detergents to **enhance their cleaning efficiency, especially in hard water.** They work by sequestering or precipitating the calcium and magnesium ions that cause water hardness, preventing them from interfering with the action of the surfactant.
- **Enzyme (C)** is correctly matched with description 2. Modern detergents often contain enzymes to **break down specific types of stains.** For example, proteases break down protein-based stains like blood and egg, while amylases work on starch-based stains.

30) Consider the following statements about the brain-eating amoeba, *Naegleria fowleri*:

1. It is a single-celled organism that can survive in soil and dust.
2. The initial symptoms of the infection are often mistaken for common illnesses like the flu.
3. The survival rate from the infection is high due to the availability of effective antiviral treatments.

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

Solution: A

- **Statement 1 is correct.** While *Naegleria fowleri* is primarily an aquatic organism found in warm freshwater, it has also been **detected in soil and dust**, indicating its ability to survive in different environments.
- **Statement 2 is also correct.** The early symptoms of Primary Amoebic Meningoencephalitis (PAM), such as **headache, fever, nausea, and vomiting, are non-specific** and can be easily confused with more common viral or bacterial infections. This often leads to a delay in diagnosis, which is a critical factor in the disease's high mortality rate.
- **Statement 3 is incorrect.** The **survival rate from PAM is extremely low**, typically around 3% worldwide. There is **no single effective cure**, and treatment usually involves a combination of antifungal and antibiotic drugs. The term 'antiviral' is also incorrect as the causative agent is an amoeba, not a virus. Early detection and aggressive treatment are crucial for any chance of survival.

31) With reference to the Saltwater Crocodile (*Crocodylus porosus*), consider the following statements.

1. It is the largest living reptile and is found exclusively in the Sundarbans of India.
2. The species is an apex predator and plays a crucial role in maintaining the ecological balance of its habitat.
3. The Bhagabatpur Crocodile Project was a successful conservation and breeding program for this species.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect.** While the Sundarbans is a major habitat for the saltwater crocodile in India, it is **not found exclusively there**. The species is also found in the **swamplands of Odisha and the coastal areas of the Andaman & Nicobar Islands**.
- **Statement 2 is correct.** The saltwater crocodile is an **apex predator** in its ecosystem. By preying on a variety of animals and scavenging on carcasses, it helps in regulating prey populations and keeping the aquatic environment clean, thus playing a vital role in maintaining ecological balance.
- **Statement 3 is also correct.** The **Bhagabatpur Crocodile Project**, initiated in 1976, was a pioneering conservation effort in West Bengal. It served as a breeding and rearing center for saltwater crocodiles, and successfully released a significant number of individuals back into the wild over several decades, contributing to the recovery of the species' population in the Sundarbans.

32) Which of the following statements about Orangutans is incorrect?

- (a) Orangutans have a very slow reproductive rate, with females giving birth only once every 6-8 years.
- (b) All three species of orangutans are listed as 'Critically Endangered' on the IUCN Red List.
- (c) The Tapanuli Orangutan is the most recently discovered and the most abundant species of orangutan.
- (d) They are the only great apes found in Asia.

Solution: C

- Statement (a) is correct. The **slow reproductive cycle of orangutans** is a major factor hindering their population recovery.
- Statement (b) is also correct. All three recognized species of orangutans - the **Bornean, Sumatran, and Tapanuli orangutans** - are classified as '**Critically Endangered**' by the IUCN, primarily due to habitat loss and poaching.
- Statement (c) is incorrect. While the **Tapanuli Orangutan is the most recently discovered species (in 2017)**, it is **also the rarest**, with a population of fewer than 1,000 individuals, making it highly vulnerable to extinction.

- Statement (d) is correct; **orangutans are the only great apes found in Asia**, with their habitat restricted to the rainforests of Borneo and Sumatra.
- 33) With reference to the Karimpuzha Wildlife Sanctuary, which one of the following statements is correct?
- (a) It is located in the Eastern Ghats and serves as a corridor for the Eastern Plains elephant.
 - (b) It was the first protected area in India to be notified under the Wildlife Protection Act, 1972.
 - (c) It links Silent Valley National Park and Mukurthi National Park, ensuring habitat continuity.
 - (d) It is primarily characterized by dry deciduous forests and thorn scrub vegetation.

Solution: C

- **Option (c) is correct.** One of the most significant ecological roles of the **Karimpuzha Wildlife Sanctuary** is its function as a corridor. By linking **Silent Valley National Park** (Kerala) and **Mukurthi National Park** (Tamil Nadu), it allows for the unhindered movement of wildlife across the state boundaries of the Nilgiri landscape.
- **Option (a) is incorrect** because the sanctuary is located in the **Western Ghats**, not the Eastern Ghats.
- **Option (b) is incorrect** because it was notified as recently as 2020; it is Kerala's 18th wildlife sanctuary.
- **Option (d) is incorrect** because the sanctuary is characterized by high-rainfall ecosystems including **evergreen, semi-evergreen, and montane wet temperate forests**, rather than dry deciduous or thorn scrub vegetation, due to its position on the windward side of the Western Ghats. This high altitudinal range and varied forest types contribute to its status as a biodiversity hotspot.

- 34) Consider the following statements regarding bio-resources and traditional medicine in Budget 2026–27:
1. Bharat-VISTAAR is a multilingual AI tool that integrates agricultural practices with bio-resource management.
 2. The entire value of biogas is excluded when calculating the Central Excise duty on biogas-blended CNG.
 3. The WHO Global Traditional Medicine Centre is being upgraded to a National Institute of Ayurveda.

Which of the statements given above are correct?

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

Solution: A

- Statement 1 is correct; **Bharat-VISTAAR** is a new multilingual AI tool developed to help farmers manage bio-resources by integrating **ICAR's** packages on agricultural practices with AI capabilities.
- Statement 2 is also correct; as part of the push for a **circular bioeconomy**, the government has excluded the **value of biogas** from the calculation of **Central Excise duty** on biogas-blended CNG. This makes renewable energy more competitive.
- Statement 3 is incorrect. The **WHO Global Traditional Medicine Centre** (Jamnagar) is being upgraded to bolster **evidence-based research** and global awareness of traditional medicine, not being converted into a National Institute of Ayurveda.
- However, the budget *did* separately announce the establishment of **3 new All India Institutes of Ayurveda**. These initiatives represent a twin-track approach: promoting high-tech biopharma through the **₹10,000 crore Biopharma Shakti** scheme, while simultaneously validating and scaling traditional AYUSH knowledge through global research hubs.

- 35) The phenomenon of 'coral bleaching' is primarily caused by:
- (a) The deposition of sediments and pollutants on the coral surface, which blocks sunlight.
 - (b) A viral infection that targets the coral polyps, causing them to lose their pigmentation.
 - (c) The expulsion of symbiotic algae from the coral's tissues due to environmental stress.
 - (d) The excessive growth of symbiotic algae called zooxanthellae within the coral's tissues.

Solution: C

Coral bleaching is a stress response in corals. The vibrant colors of healthy corals are due to the presence of microscopic algae called **zooxanthellae**, which live in a symbiotic relationship within the coral's tissues. These algae provide the coral with most of its food through photosynthesis. When the coral is subjected to environmental stress, particularly **increased sea temperatures**, this symbiotic relationship breaks down. The coral expels the zooxanthellae, causing it to lose its color and turn white, hence the term 'bleaching'. Bleaching leaves the coral in a weakened state, and if the stress is prolonged, the coral will starve and die.

36) Consider the following statements regarding Biochar:

1. It is a carbon-rich byproduct formed through the pyrolysis of agricultural residue.
2. The application of biochar to soil invariably leads to a 30-50% increase in crop yields across all soil types.
3. Biochar can be used as a partial replacement for cement in concrete, enhancing its mechanical strength and heat resistance.

How many of the above statements are incorrect?

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

Solution: A

- **Statement 1 is correct.** Biochar is a stable, carbon-rich solid material produced from the pyrolysis of biomass. Pyrolysis is a thermochemical process that involves heating biomass (such as agricultural waste, wood, or manure) in a low-oxygen or oxygen-free environment. This process results in the creation of biochar, along with bio-oil and syngas as byproducts. The high carbon content and stability of biochar make it an effective tool for carbon sequestration when added to the soil.
- **Statement 2 is incorrect.** While biochar application can enhance crop yields, the increase is typically in the range of 10-25%, not 30-50%. The benefits of biochar are most pronounced in **semi-arid, nutrient-depleted soils**. The statement's claim of an invariable 30-50% increase across all soil types is an overstatement and does not reflect the nuanced impact of biochar on agricultural productivity.
- **Statement 3 is correct.** Research, including studies from institutions like IIT-Madras, has demonstrated the potential of using biochar as a sustainable additive in construction materials. Incorporating a small percentage (2-5%) of biochar into concrete mixtures has been shown to **improve the mechanical strength and increase heat resistance by approximately 20%**. This application not only enhances the properties of concrete but also contributes to decarbonizing the construction sector by sequestering carbon and offering a green alternative to traditional cement.

3. Geography

1) Consider the following statements regarding the impact of El Niño on India:

1. A strong El Niño always guarantees a total failure of the South-West monsoon across the entire Indian subcontinent.
2. El Niño conditions are exclusively responsible for the rising sea levels observed along the Indian coastline in the last decade.
3. The phenomenon leads to a significant increase in the nutrient-rich upwelling in the Arabian Sea, boosting Indian fisheries.

How many of the above statements are correct?

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

Solution: D

- Statement 1 is incorrect; while El Niño often **suppresses** the monsoon and leads to below-normal rainfall (as seen in the 60% drought probability), it does not "always guarantee a total failure." Other factors like the Indian Ocean Dipole (IOD) also play a role.
- Statement 2 is incorrect; sea-level rise is a complex result of global warming, thermal expansion, and glacial melt. El Niño is a **recurring periodic cycle**, not the "exclusive" cause of long-term decadal sea-level trends.
- Statement 3 is incorrect. As discussed with the Peruvian coast, El Niño generally **disrupts normal oceanic patterns**. It often correlates with higher temperatures and monsoon suppression in India, which negatively affects agricultural output and water security rather than "boosting fisheries" through upwelling. In fact, the shift in warm water and atmospheric disruption pulls moisture away from South Asia.

2) Match the following types of Carbon Capture and Utilisation (CCU) with their representative products/uses:

Type of CCU	Representative Product/Use
I. Direct Utilisation	A. Urea and Polymers
II. Chemical Conversion	B. Carbonated Beverages
III. Biological Conversion	C. Green Concrete and Bricks
IV. Mineralisation	D. Animal Feed and Biofuels

Select the correct answer using the code given below:

- (a) I-C, II-A, III-D, IV-B
- (b) I-A, II-B, III-C, IV-D
- (c) I-B, II-D, III-A, IV-C
- (d) I-B, II-A, III-D, IV-C

Solution: D

Carbon Capture and Utilisation (CCU) refers to processes where captured carbon dioxide is used as a resource rather than stored permanently. The different pathways lead to distinct product categories.

I. Direct Utilisation → B. Carbonated Beverages

Direct utilisation involves using captured CO₂ without major chemical transformation. A classic example is injecting CO₂ into soft drinks and beverages for carbonation.

II. Chemical Conversion → A. Urea and Polymers

In chemical conversion, CO₂ reacts with other substances to form value-added chemicals. For example, CO₂ reacts with ammonia to produce urea (widely used as fertiliser), and it can also be used in producing polymers and synthetic fuels.

III. Biological Conversion → D. Animal Feed and Biofuels

Biological pathways use microorganisms or algae to convert CO₂ into biomass. This biomass can be processed into biofuels or protein-rich animal feed.

IV. Mineralisation → C. Green Concrete and Bricks

Mineralisation involves reacting CO₂ with minerals (like calcium or magnesium compounds) to form stable carbonates. These are incorporated into building materials such as green concrete and carbon-cured bricks.

3) Consider the following statements regarding the Mons Mouton on the Moon:

1. It is a flat-topped lunar mountain massif located near the lunar North Pole.
2. The region is characterized by near-continuous sunlight and lacks permanently shadowed regions.

Which of the above statements are correct?

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

Solution: D

- **Statement 1 is incorrect.** Mons Mouton is a large flat-topped lunar mountain massif located near the **Moon's South Pole**, not the North Pole. It is situated approximately 160 km from the lunar south pole, close to the rim of the South Pole–Aitken (SPA) Basin.
- Geologically, Mons Mouton is believed to have formed during the ancient massive asteroid impacts that created the SPA Basin. The resulting rim uplift exposed the **deep lunar crust**, which provides a unique window into the Moon's early formation and geological history, making it a high-priority target for scientific study.
- **Statement 2 is incorrect.** One of the defining features of Mons Mouton and the broader lunar south polar region is its **unique illumination conditions**. While some areas on the mountain receive near-continuous sunlight (useful for solar power), other nearby areas are in **permanent shadow**. These permanently shadowed regions are of immense interest as they may contain **lunar volatiles** like water ice.

4) Consider the following statements in the context of Lightning characteristics and occurrence in India

1. Lightning is a rapid discharge of atmospheric electricity.
2. Eastern and central India experience the highest cloud-to-ground strikes.
3. Palm trees provide immediate protection against lightning strikes.

How many of the above statements is/are correct?

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

Solution: B

Statement 3 is incorrect.

Lightning is indeed a rapid discharge of electricity in the atmosphere. This occurs when there's a buildup of electrical charge within clouds or between clouds and the ground, which is then suddenly released, creating the flash we see as lightning.

According to the Annual Lightning Report 2023-2024 published by CROPC and IMD, **eastern and central India do experience the highest number of cloud-to-ground (CG) lightning strikes.** This is likely due to the specific atmospheric conditions prevalent in these regions.

Palm tree needs at least 15 to 20 years to attain a height of 20 feet. Therefore, they do not provide immediate protection against lightning strikes, but rather a long-term solution.

5) Consider the following statements.

1. Khanij Bidesh India Ltd is a private joint venture that aims to secure critical minerals globally.
2. Lithium is an alkali metal used in rechargeable batteries and medical devices like pacemakers.
3. Niobium is a silvery metal with a corrosion-resistant oxide layer on its surface.

How many of the above statements is/are incorrect?

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

Solution: A

Statement 1 is incorrect.

Initiatives for Critical Minerals exploration:

Initiative	Details
Amendment to Mines and Minerals (Development and Regulation) Act	Amendment to MMRDA in 2023 delisted six minerals, including Lithium and Niobium, from the list of atomic minerals, thereby allowing private sector participation
	Provided for the auction of mining leases and composite licenses of 24 critical and strategic minerals by the central government
Khanij Bidesh India Ltd	It is a government joint venture that aims to secure critical minerals globally, with a focus on Australia and South America.

Mineral	Description	Common Uses
Lithium	An alkali metal used in rechargeable batteries for mobiles, laptops, electric vehicles, and medical devices like pacemakers.	Rechargeable batteries, energy storage.
Rare Earth Elements	A group of 17-odd minerals including scandium, yttrium, cerium, and more.	Catalysts, magnets, alloys, glass, electronics, petroleum extraction, electric motors, wind turbines.
Niobium	A silvery metal with a corrosion-resistant oxide layer on its surface. The main source of Niobium is the mineral columbite, which is found in countries such as Canada, Brazil, Australia, and Nigeria.	Alloys (stainless steel), jet engines, construction materials, superconducting magnets (particle accelerators, MRI scanners).

6) With reference to the Ravi River, consider the following statements:

1. It originates near the Rohtang Pass in the Zaskar Range of the Himalayas.
2. Under the Indus Waters Treaty (1960), the waters of the Ravi are allocated exclusively to India.
3. The river forms a part of the international boundary between India and Pakistan before joining the Chenab River.

How many of the above statements are incorrect?

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

Solution: A

- The **Ravi River** is one of the five major rivers of the Punjab region.
- **Statement 1 is incorrect** because while it does originate near the **Rohtang Pass**, this pass is located in the **Pir Panjal Range**, not the Zaskar Range. The river rises at an elevation of 4,400 meters and is formed by the confluence of the **Budhil and Tantgari** streams.
- **Statement 2 is correct**; under the **Indus Waters Treaty of 1960**, the three "Eastern Rivers" (Ravi, Beas, and Sutlej) were allocated to India for exclusive use, while the "Western Rivers" (Indus, Jhelum, and Chenab) were allocated to Pakistan.
- **Statement 3 is correct** as the Ravi flows through Himachal Pradesh and Punjab, forming the **international border** between India and Pakistan for a certain stretch before entering Pakistan to flow past Lahore and eventually merge with the **Chenab River**.
- India is currently working on projects like the **Shahpur Kandi Dam** to fully utilize its share of the Ravi's water, which otherwise flows unutilized into Pakistan during the monsoon season.

7) Consider the following statements about Stratospheric Aerosol Injection (SAI) and Cirrus Cloud Thinning (CCT):

1. Both SAI and CCT target shortwave solar radiation to mitigate global warming.
2. SAI involves dispersing reflective aerosols in the troposphere, while CCT focuses on reducing the amount of longwave radiation emitted by cirrus clouds.
3. Both techniques aim to increase the Earth's albedo to reduce the amount of heat absorbed by the surface.

How many of the above statements is/are correct?

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

Solution: A

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Both Stratospheric Aerosol Injection (SAI) and Cirrus Cloud Thinning (CCT) are aimed at increasing the Earth's albedo. **SAI focuses on reflecting shortwave solar radiation** by injecting reflective aerosols like sulfur dioxide into the stratosphere. **CCT, on the other hand, aims to reduce cirrus clouds' thickness and cover to allow more longwave radiation to escape into space**, thus reducing the greenhouse effect.

Statement 1 is incorrect because while SAI targets shortwave solar radiation, CCT focuses on longwave radiation emitted by cirrus clouds.

Statement 2 is incorrect because SAI targets the stratosphere, not the troposphere, and CCT reduces the greenhouse effect by affecting longwave radiation, not shortwave solar radiation.

8) Consider the following statements about the composition and formation of coking coal:

1. Coking coal has high sulphur and phosphorus levels, making it ideal for steel production.
2. It is formed from the carbonization process, which produces metallurgical coke at high 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

Solution: B

Statement 2 is correct: **Coking coal undergoes a carbonization process at high temperatures to produce metallurgical coke, which is crucial for steel production.**

Statement 1 is incorrect. Coking coal must have low sulphur and phosphorus levels to avoid contamination in steel production, and a high, not low, carbon content is essential to provide the required strength and efficiency in the blast furnace process. These factors underline the significance of specific chemical and physical properties of coking coal in its role within the steel industry.

- 9) Consider the following statements regarding Solar Radiation Management (SRM) and the use of diamond dust:
1. SRM aims to reduce greenhouse gases in the atmosphere by increasing the amount of sunlight that reaches the Earth's surface.
 2. Diamond dust is considered for SRM due to its low reflectivity and minimal effect on solar radiation.
 3. The Mount Pinatubo eruption is an example of natural SRM effects, where sulfur dioxide release led to a temporary cooling of the Earth's surface.

How many of the above statements are correct?

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

Solution: A

Only statement 3 is correct.

The Mount Pinatubo eruption in 1991 released vast amounts of sulfur dioxide, which created a reflective aerosol layer in the stratosphere. This layer temporarily cooled the Earth by approximately 0.5°C, demonstrating a natural form of SRM.

Statement 1 is incorrect because **SRM does not reduce greenhouse gases**; instead, it aims to reduce the amount of heat reaching the Earth's surface by reflecting sunlight back into space.

Statement 2 is incorrect because **diamond dust is considered for SRM due to its high reflectivity, making it highly effective at scattering solar radiation** and potentially reducing global temperatures if dispersed in the stratosphere. This approach mimics volcanic cooling effects without altering atmospheric greenhouse gas levels.

- 10) The Great Nicobar Project, recently cleared by the NGT, is strategically significant due to its proximity to:
- (a) The Strait of Hormuz
 - (b) The Malacca Strait
 - (c) The Suez Canal
 - (d) The Bab-el-Mandeb

Solution: B

- The **Great Nicobar Project** is a massive infrastructure plan located on the southernmost island of the Andaman and Nicobar archipelago. Its location is of immense strategic importance because it lies very close to the **Malacca Strait**, which is one of the world's busiest and most critical shipping lanes.
- Nearly one-third of global trade passes through this channel. By developing an **International Transshipment Port** at Galathea Bay, India aims to tap into this global logistics network and reduce its dependence on foreign ports like Singapore or Colombo.

The project also includes a **dual-use civil-military airport**, which will enhance India's maritime surveillance and security presence in the **Indian Ocean Region (IOR)**.

- 11) With reference to the Great Nicobar Island, consider the following statements:
1. It is the southernmost island of the Andaman and Nicobar archipelago and is home to the Galathea Bay.
 2. The island is situated in close proximity to the "Six Degree Channel," a major international shipping route.

Which of the above statements are correct?

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

Solution: C

Statement 1 is correct; Great Nicobar is the southernmost tip of India (containing Indira Point) and features **Galathea Bay**, a critical nesting site for leatherback turtles.

Statement 2 is correct; the island sits adjacent to the **Six Degree Channel** and the Malacca Strait, giving it immense strategic leverage over global maritime trade.

12) Which of the following best describes the primary objective of 'Project Vault' recently launched by the United States?

- (a) A mission to establish a permanent human colony on the lunar south pole.
- (b) A cybersecurity framework to protect federal agencies from ransomware attacks.
- (c) A strategic maritime alliance to counter piracy in the Western Indian Ocean.
- (d) A \$12 billion initiative to stockpile critical minerals and rare earth elements.

Solution: D

- **Project Vault** is a strategic initiative launched by the United States government, specifically announced by Donald Trump, aimed at securing the nation's supply of **critical minerals and rare earth elements**. With a funding of **\$12 billion**, the project is modeled after the concept of the **Strategic Petroleum Reserve (SPR)** but focuses on minerals like **cobalt, gallium, and rare earths** which are essential for high-tech industries and national defence.
- The primary driver behind this initiative is the need to **reduce strategic dependence on China**, which currently dominates the global processing and supply chains of these minerals. Global supply shocks, geopolitical tensions, and export controls have highlighted the vulnerability of American industries, including **aerospace, automotive (specifically EVs), and defence manufacturing**. By creating a robust stockpile, the U.S. aims to ensure **uninterrupted access** to these materials during times of crisis or market volatility.
- The project is unique because it employs a **public-private stockpiling model**.

13) With reference to the 'Brahmaputra River', consider the following pairs:

Region/Nation	Name of the River
1. Tibet	Yarlung Tsangpo
2. Arunachal Pradesh	Siang/Dihang
3. Bangladesh	Jamuna

Which of the pairs given above are correctly matched?

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

Solution: D

- The Brahmaputra is a transboundary river with various names across its course.
- In **Tibet**, where it originates from the **Chemayungdung Glacier**, it is known as the **Yarlung Tsangpo**.
- As it enters India through **Arunachal Pradesh**, it is called the **Siang or Dihang**.
- After flowing through the plains of Assam, where it becomes the Brahmaputra, it enters **Bangladesh** and is renamed the **Jamuna**. It later merges with the Padma (Ganga) and the Meghna before emptying into the Bay of Bengal.

- The river is notable for its **highly braided channel** in Assam due to heavy siltation and its role in forming the **world's largest delta**.

14) With reference to the 'Brahmaputra River', consider the following statements:

1. It originates from the Chemayungdung Glacier near Lake Mapam in Tibet.
2. The drainage basin of the river in India is limited to the states of Arunachal Pradesh and Assam.
3. It flows through the Yarlung Tsangpo Grand Canyon, which is among the deepest gorges globally.

Which of the statements given above are correct?

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

Solution: C

- Statement 1 is correct; the river begins its journey in the high altitudes of Tibet.
- Statement 2 is **incorrect** because while the main stem of the river flows primarily through Arunachal Pradesh and Assam, its **drainage basin** (the area from which it collects water through tributaries) is much wider. It covers parts of **Nagaland, Meghalaya, West Bengal, and Sikkim**.
- Statement 3 is correct; the river is famous for cutting through the **Yarlung Tsangpo Grand Canyon**, a massive geological feature created as the river turns south to enter India. This region is characterized by extreme descent and massive water volume, contributing to the river's status as one of the world's highest discharge rivers.

15) Consider the following statements:

Statement I: The Startup India Fund of Funds 2.0 (FoF 2.0) does not invest directly in individual startup entities.

Statement II: FoF 2.0 is designed to mobilize long-term domestic capital by investing in SEBI-registered Alternative Investment Funds (AIFs).

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

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

Solution: A

- **Statement I** is correct. The "Fund of Funds" model is a multi-tier investment strategy where the government does not pick individual startups to fund.
- **Statement II** correctly explains that the government invests its **₹10,000 crore corpus** into **Alternative Investment Funds (AIFs)**. These AIFs, which are registered with **SEBI**, then use their professional expertise to identify and invest in high-potential startups. This structure leverages private sector expertise and multiplies the impact of government capital.
- The FoF 2.0 specifically focuses on **deep-tech** and **innovative manufacturing**, sectors that often face "high-risk capital gaps." By supporting smaller AIFs, the government aims to deepen the local venture capital ecosystem and reduce reliance on foreign funding for early-stage Indian innovations.

16) In the context of Science and Technology, "Magnetic Reconnection" is most relevant to which of the following?

- (a) The process of cooling the Sun's core using liquid hydrogen.
- (b) The method used by migratory birds to navigate using the Earth's poles.
- (c) The mechanism used to stabilize nuclear fusion in Tokamak reactors.

(d) The release of energy during solar eruptions like Coronal Mass Ejections (CMEs) and flares.

Solution: D

- **Magnetic reconnection** is a fundamental physical process in plasma physics, occurring when oppositely directed magnetic field lines "break" and "reconnect," releasing vast amounts of stored magnetic energy. In the context of the Sun, this process is responsible for **solar flares and Coronal Mass Ejections (CMEs)**. For **Stealth CMEs**, the reconnection is often "low-energy" and gradual, which is why they produce minimal electromagnetic signatures like X-ray bursts.
- However, the importance of magnetic reconnection extends to Earth. When a CME reaches Earth, its magnetic field interacts with the Earth's magnetosphere. If the CME's magnetic field is oriented **southward**, it can undergo magnetic reconnection with Earth's northward-pointing field lines. This "opens" the magnetosphere, allowing solar plasma to enter and trigger **geomagnetic storms**. This process can disrupt **satellites, radio communications, and power grids**. The study of the **March 2023 storm** highlighted how even "stealthy" reconnection at the Sun can eventually lead to powerful energetic interactions at Earth.

17) With reference to the Agricultural and Processed Food Products Export Development Authority (APEDA), consider the following statements:

1. It is a statutory body functioning under the Ministry of Agriculture and Farmers Welfare.
2. It serves as the Secretariat for the National Programme for Organic Production (NPOP).
3. It has the mandate to monitor the imports of sugar into India.

How many of the above statements are correct?

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

Solution: B

- Statement 1 is incorrect because **APEDA** is a statutory body established under the APEDA Act of 1985, but it functions under the **Ministry of Commerce and Industry**, not the Ministry of Agriculture.
- Statement 2 is correct; APEDA plays a pivotal role in the **National Programme for Organic Production (NPOP)**, acting as its Secretariat to regulate the certification of organic products for export. This ensures that Indian organic exports meet international standards.
- Statement 3 is also correct; while its primary focus is export promotion, APEDA has been specifically entrusted with the task of **monitoring sugar imports**. This dual role in both export facilitation and specific import oversight makes it a unique trade body. APEDA replaced the Processed Food Export Promotion Council (PFEP), signifying a shift toward a more robust statutory framework for agricultural trade.
- Over the last 40 years, it has been instrumental in helping India's agricultural exports cross the **\$25 billion** mark, directly impacting rural economies and contributing to the national objective of enhancing farmer livelihoods through global market integration.

18) In the context of solar activity, what is the primary role of "Coronal Holes" in the progression of a Stealth Coronal Mass Ejection (CME)?

- (a) They act as a shield that prevents the CME from reaching the Earth's atmosphere.
- (b) They trigger intense solar flares that make the stealth CME visible to radio telescopes.
- (c) They absorb the magnetic flux of the CME, rendering it geo-ineffective.
- (d) They provide high-speed solar wind that can accelerate and guide the CME toward Earth.

Solution: D

- **Coronal holes** are regions where the Sun's magnetic field is "open," allowing plasma to escape into space as **high-speed solar wind**. In the context of **Stealth CMEs**, these holes play a crucial role in their travel and

eventual impact on Earth. While stealth CMEs themselves are slow-moving and faint, if they originate near a coronal hole, the **resultant high-speed streams** can "push" or **accelerate the CME**.

- This interaction increases the **kinetic energy** of the CME and helps guide it along the interplanetary magnetic field lines toward Earth. Once the CME reaches Earth, it can trigger **geomagnetic storms** that disrupt **GPS systems, power grids, and satellite communications**.
- The lack of low-coronal signatures means that without monitoring the high-speed winds from coronal holes, these CMEs remain hidden.
- The study of the **March 2023 geomagnetic storm** highlighted how these faint eruptions, though seemingly weak at the source, become highly **geoeffective** due to their interaction with the surrounding solar environment.

19) Consider the following statements regarding the geographical features of Bangladesh:

1. It is home to the Sundarbans, the world's largest mangrove forest, located in the southeast.
2. The Chittagong Hill Tracts represent a rare hilly region in an otherwise low-lying deltaic country.
3. The country shares land borders with India and Myanmar.

How many of the above statements are correct?

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

Solution: B

- Bangladesh's geography is defined by its riverine and coastal features.
- **Statement 1 is incorrect** because the **Sundarbans**, while the world's largest mangrove forest, is located in the **southwest** of the country (bordering India's West Bengal), not the southeast. The southeast is characterized by the Chittagong region.
- **Statement 2 is correct**; the majority of Bangladesh is a low-lying delta less than 30 feet above sea level, but the **Chittagong Hill Tracts** in the southeast provide a significant topographical contrast with their hilly terrain.
- **Statement 3 is correct**; Bangladesh is bordered by **India** on three sides (West Bengal, Assam, Meghalaya, Tripura, and Mizoram) and by **Myanmar (Burma)** in the southeast. To the south, it opens to the **Bay of Bengal**. The riverine system, dominated by the Padma (Ganges), Jamuna (Brahmaputra), and Meghna, frequently reshapes the landscape, depositing fertile soil but also causing devastating floods.

20) With reference to Dal Lake in Srinagar, consider the following statements:

1. It is a tectonic-glacial lake that forms part of the Jhelum River system through controlled outflows.
2. The lake is divided into four distinct basins: Gagribal, Lokut Dal, Bod Dal, and Nagin.
3. The "Raad" refers to the iconic houseboats that serve as the primary residence for the lake dwellers.

Which of the statements given above are correct?

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

Solution: C

- Dal Lake is a complex urban wetland.
- **Statement 1 is correct**; it was formed by tectonic and glacial processes in the Himalayan basin and is hydrologically connected to the **Jhelum River**. It receives water from mountain streams and drains into the Jhelum through controlled channels.
- **Statement 2 is correct**; the lake is not a single open body of water but is divided by causeways into four basins: **Gagribal, Lokut Dal, Bod Dal, and Nagin**. This compartmentalization affects water circulation and ecological health.

- **Statement 3 is incorrect** because "Raad" does not refer to houseboats; it refers to the **floating gardens** used for vegetable cultivation. These are unique agricultural mats made of matted vegetation and soil. While houseboats and shikaras are famous features of the lake, they are distinct from the "Raad" system.

21) Consider the following statements about the Dhauladhar range:

1. Lam Dal Lake, a notable glacial lake, is located in the Dhauladhar range.
2. The range's highest peak is Indrahara Pass.
3. The Dhauladhar range is primarily composed of limestone and sandstone.

How many of the above statements are incorrect?

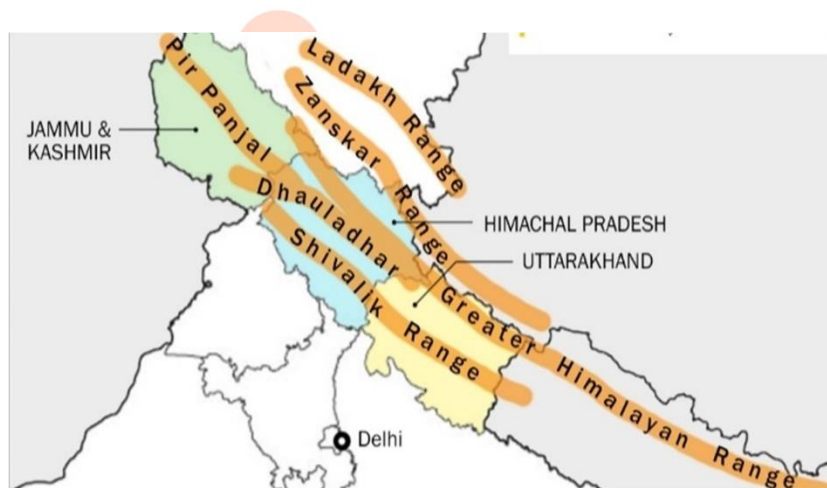
- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Solution: B

Statement 1 is correct; **Lam Dal Lake, a notable glacial lake, is located within the Dhauladhar range.**

Statement 2 is incorrect because the highest peak in the Dhauladhar range is Hanuman Tibba, not Indrahara Pass.

Statement 3 is also incorrect as the **Dhauladhar range is primarily composed of granite, with only some deposits of limestone and sandstone.**



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22) Consider the following statements regarding Wular Lake:

1. Wular Lake is located in Rajasthan and is the largest freshwater lake in India.
2. It is Ramsar-listed due to its ecological importance and biodiversity.
3. Wular Lake is primarily a saline Lake.
4. It is situated near the Pir Panjal mountain range in Jammu and Kashmir.

- (a) 2 and 4 only
- (b) 1, 3, and 4 only
- (c) 1, 2 and 3 only
- (d) 1, 2, 3 and 4

Solution: A

Statement 1 is incorrect, as Wular Lake is in Jammu and Kashmir, not Rajasthan.

Statement 2 is correct, as **Wular Lake is Ramsar-listed**, highlighting its ecological significance.

Statement 3 is incorrect as well, as Wular is a freshwater lake, not saline like Sambhar.

Statement 4 is also correct, as it is located near the Pir Panjal range in Jammu and Kashmir.

23) Consider the following statements about polio virus transmission and eradication efforts:

1. The polio virus primarily spreads through respiratory droplets.
2. In India, multiple rounds of oral polio vaccine (OPV) immunization are conducted to prevent Circulating Vaccine-derived Poliovirus (cVDPV) transmission.
3. India was declared polio-free by the World Health Organization (WHO) in 2011.
4. High-quality immunization campaigns have no impact on Circulating Vaccine-derived Poliovirus (cVDPV) transmission rates.

How many of the above statements is/are incorrect?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: C

Statement 2 is correct; India has implemented multiple rounds of Oral Polio Vaccine (OPV) immunization to prevent cVDPV transmission, especially in areas with low coverage.

Statement 1 is incorrect because the **polio virus primarily spreads through the fecal-oral route, not respiratory droplets.**

Statement 3 is incorrect as India was declared polio-free by WHO in 2014, with the last wild polio case reported in 2011.

Statement 4 is also incorrect since high-quality immunization campaigns are critical in reducing and eventually stopping cVDPV transmission.

24) Which of the following best describes the primary significance of Bandhavgarh Tiger Reserve?

- a) It is exclusively a bamboo forest reserve, focused on the conservation of bamboo species.
- b) It serves primarily as an archaeological site with no significant biodiversity.
- c) It is a tiger reserve with the highest density of Royal Bengal Tigers in India and globally.
- d) It is a grassland reserve in the Satpura range, focusing solely on herbivore conservation.

Solution: C

Bandhavgarh Tiger Reserve is known for its exceptionally high density of Royal Bengal Tigers, making it a crucial area for tiger conservation in India and worldwide.

Option a) is incorrect, as the vegetation includes a mix of tropical moist deciduous forests, grasslands, and bamboo, but it is not focused solely on bamboo conservation

Option b) is incorrect because, while it contains the historic Bandhavgarh Fort, the reserve is also rich in biodiversity.

Option d) is incorrect as the reserve's main focus is tiger conservation, not solely herbivores.

25) With respect to Sambhar Lake in Rajasthan, consider the following statements:

1. Sambhar Lake is India's largest freshwater lake and is a UNESCO World Heritage Site.
2. It is designated as a Ramsar site and supports a rich diversity of migratory birds.
3. The lake is a significant site for salt production in India.

How many of the statements given above are incorrect?

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

Solution: A

- Sambhar Lake is India's largest inland saline (saltwater) lake, not a freshwater lake. It is not a UNESCO World Heritage Site but is recognized as a Ramsar site.
- It was designated as a Ramsar site in 1990 due to its importance as a wetland that supports a rich diversity of migratory birds, including flamingos and pelicans.
- Sambhar Lake is significant for salt production, producing about 210,000 tonnes of salt annually, contributing to Rajasthan's status as one of India's top salt-producing states.

Therefore, Option a) is the correct Solution here.

26) Concerning the DANA (Depresión Aislada en Niveles Altos) phenomenon, consider the following statements:

1. DANA is caused by a high-pressure system over the Mediterranean Sea leading to dry conditions.
2. The phenomenon involves the interaction between a pocket of cold air and warm, moist air over the sea.
3. Climate change has intensified DANA events, making them more severe and widespread.

How many of the above statements are correct?

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

Solution: B

Statement 1 is incorrect.

- DANA is not caused by a high-pressure system leading to dry conditions; rather, it is associated with low-pressure systems and atmospheric instability causing heavy rainfall.
- DANA occurs when a pocket of cold air descends and interacts with warm, moist air over the Mediterranean Sea, leading to the formation of storm clouds and intense rainfall.
- Climate change has led to warmer sea temperatures, increasing the amount of moisture in the air and intensifying DANA events, making them more severe and geographically widespread.

27) Which of the following statements accurately describe the Kimberley Process (KP)?

1. It is a United Nations-led initiative where only government entities are members.
2. It aims to prevent "conflict diamonds" from entering the mainstream rough diamond market.
3. India has been selected to chair the Kimberley Process starting January 2026.

Select the correct answer using the code given below:

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

Solution: D

- **Statement 1 is incorrect.** The Kimberley Process is a **tripartite initiative** involving **governments, the diamond industry, and civil society**. It is not a UN-only body, though it was established following UN Security Council resolutions.
- **Statement 2 is correct.** The primary goal is to eliminate "**conflict diamonds**"—rough diamonds used by rebel movements to finance wars against legitimate governments. The Kimberley Process Certification Scheme (KPCS) ensures that all exports are accompanied by a certificate proving they are conflict-free.
- **Statement 3 is correct.** **India** has been selected to assume the **Chairpersonship of the KP from January 1, 2026**. This will be India's third time leading the global initiative. Today, the KP covers 60 participants (with the EU as one) and accounts for over **99% of the global rough diamond trade**, successfully reducing the illicit trade to negligible levels.

28) The 'Cheenkanni River' is a major hydrological feature of which of the following protected areas?

- (a) Brahmagiri Wildlife Sanctuary

- (b) Kottiyoor Wildlife Sanctuary
- (c) Aralam Butterfly Sanctuary
- (d) Wayanad Wildlife Sanctuary

Solution: C

The **Cheenkanni River** is the primary drainage system for the **Aralam Butterfly Sanctuary** in the Kannur district of Kerala. The river and its tributaries create the humid, lush microclimates necessary for the sanctuary's diverse flora and fauna. Aralam was originally constituted in **1984** and was recently renamed to emphasize its status as the **first butterfly sanctuary in Kerala**. The sanctuary's location on the western slopes of the Western Ghats ensures high annual rainfall, contributing to the river's flow and the resulting evergreen forest habitat. This habitat supports **266 species of butterflies**, including several Schedule I species like the **Slender Loris**.

29) With reference to the concept of 'Day Zero', consider the following statements:

1. It refers to the point when a city's usable water supply falls below a critical threshold.
2. Under Day Zero, water is prioritized for agriculture to ensure food security.
3. The crisis is often a result of over-extraction of groundwater and poor urban planning.

How many of the statements given above are correct?

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

Solution: B

- **Statement 1 is correct; Day Zero** is defined as the threshold where regular tap water supply is shut off due to critically low reservoir or groundwater levels. Statement 3 is also correct, as the crisis is typically a culmination of **long-term stressors** like groundwater over-extraction, climate change, and weak governance.
- **Statement 2 is incorrect** because, during a Day Zero event, water is prioritized for **essential services** such as **hospitals, sanitation, and firefighting**, rather than agriculture. In urban settings, residential taps are closed, and citizens must collect rationed water from emergency distribution points. This phenomenon leads to significant **urban disruption** and can cause social unrest, disproportionately affecting vulnerable populations in informal settlements.

30) Consider the following statements regarding the 'Polar Vortex':

1. It is a high-pressure system that develops over the poles during the summer months due to intense solar heating.
2. A strong polar vortex is characterized by a wavy jet stream that allows cold Arctic air to spill into mid-latitudes.
3. Sudden Stratospheric Warming (SSW) events typically strengthen the tropospheric polar vortex, keeping cold air locked at the poles.

How many of the statements given above are correct?

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

Solution: D

- Statement 1 is incorrect because the polar vortex is a **large area of low pressure** (not high pressure) and extremely cold air that is most persistent during the **winter months**.
- Statement 2 is incorrect because a **strong vortex** keeps the jet stream stable and straight, locking the cold air at the poles; it is a **weakened or disrupted vortex** that makes the jet stream wavy, leading to cold air outbreaks in regions like the US or Europe.

Statement 3 is incorrect because **Sudden Stratospheric Warming (SSW)** refers to rapid warming in the stratosphere that **weakens or splits the vortex**, causing it to collapse and push freezing air southward. The phenomenon is also influenced by **Arctic amplification**, where the Arctic warms faster than lower latitudes, reducing the temperature gradient and destabilizing the atmospheric circulation.

31) Which of the following is/are considered "Secondary Impacts" of an avalanche?

1. Destruction of buildings and bridges
2. Economic losses due to disruption of tourism
3. Communication isolation of mountain communities
4. Destruction of entire forests and alteration of local ecosystems

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 1, 2, 3 and 4
- (c) 3 and 4 only
- (d) 2, 3 and 4 only

Solution: D

- Impacts of natural disasters are often categorized into primary and secondary. **Primary impacts** are the direct results of the physical event, such as **loss of life** (suffocation/trauma) and **structural destruction** (buildings/bridges being crushed). **Statement 1 is a primary impact.**
- **Secondary impacts** are the cascading consequences that follow. **Statement 2 (Economic losses), Statement 3 (Communication isolation), and Statement 4 (Environmental damage/forest destruction)** are all secondary impacts. When highways are blocked and power lines are severed, communities become isolated—this is a consequence of the initial destruction.
- Similarly, the long-term financial strain on agriculture and tourism and the permanent alteration of ecosystems are indirect results of the slide. Government bodies like **DGRE and NDMA** work on "Hazard Zonation" to minimize these impacts by ensuring that critical infrastructure is either built away from high-risk paths or reinforced with **avalanche-resistant tunnels** like the Zojila Tunnel.

32) Consider the following statements:

Statement I: India is the world's second-largest steel producer but remains "Coking Coal Poor" in terms of usable domestic supply.

Statement II: Indian coking coal deposits are predominantly found in the coastal belts of Peninsular India.

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

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

Solution: C

- **Statement I is correct.** India currently holds the position of the **world's second-largest steel producer**. However, it is described as "Coking Coal Poor" because, despite having total resources of approximately **37 Billion Tonnes**, it cannot meet its industrial requirements domestically. About **95% of its coking coal** is imported because the domestic variety has high ash content and requires complex washing.
- **Statement II is incorrect.** Indian coking coal deposits are not found in coastal belts. Instead, they are concentrated in the **inland Gondwana rock formations** of eastern and central India. The primary reserves are located in **Jharkhand (Jharia, Bokaro)**, with other significant deposits in **West Bengal, Chhattisgarh, and Madhya Pradesh**.
- The "Import Paradox" exists because the inland location and high ash content make it more expensive or technically difficult to use compared to high-quality imported coal from Australia or the USA.

33) Consider the following statements regarding the impact of Western Disturbances on Indian agriculture:

1. They provide essential natural irrigation for Rabi crops like Wheat and Gram.
2. Intense Western Disturbances are always beneficial as they prevent root rot in standing crops.
3. They are the primary source of non-monsoonal rainfall in North India.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is correct.** Western Disturbances (WDs) are considered a **boon for Rabi crops** (Wheat, Mustard, Gram/Chana). The light to moderate rainfall they bring to the plains of Punjab, Haryana, and Uttar Pradesh provides much-needed natural irrigation during the dry winter months, which is vital for the growth of these crops.
- **Statement 2 is incorrect.** While moderate rain is beneficial, **intense WDs** can be a **bane for farmers**. They can cause heavy **hailstorms and thunderstorms**, which physically damage standing crops. Furthermore, excessive rainfall can lead to waterlogging. The IMD recently advised farmers to drain excess water specifically to **prevent root rot**, which is a disease caused by overly moist soil—contrary to the statement suggesting WDs prevent it.
- **Statement 3 is correct.** WDs are the **primary source of non-monsoonal rainfall** in India. While the Southwest Monsoon provides the bulk of India's annual rain, WDs are responsible for the majority of precipitation received between December and February in North and Northwest India. They also bring heavy snowfall to the Western Himalayas, which is essential for maintaining the health of glaciers that feed perennial rivers like the Ganga and Indus.

34) With reference to "Wet Snow Avalanches," which of the following statements is correct?

- (a) They move at extremely high speeds, reaching up to 300 km/h.
- (b) They are primarily composed of dry, loose snow that forms an aerosol cloud.
- (c) They possess enormous destructive force due to the high density of the snow.
- (d) They are rarely triggered by rain-on-snow events.

Solution: C

- **Wet snow avalanches** differ significantly from powder snow avalanches. While powder avalanches move at high speeds (300 km/h) as a turbulent cloud, wet snow avalanches move **more slowly**.
- However, because the snow is saturated with water—often due to **rain-on-snow events** or rapid melting—it becomes extremely dense and heavy. This **high density** gives the avalanche **enormous destructive force**, capable of crushing buildings and infrastructure that might otherwise withstand a lighter, faster powder slide.
- **Statement (c) is the correct answer.** These types of avalanches act more like a "viscous flow" or a concrete mix, making them difficult to stop once they gain momentum.
- The **NDMA guidelines** emphasize that these are particularly common during the spring thaw or during unseasonable rain in high-altitude regions. Monitoring these requires **Automated Weather Stations (AWS)** to track temperature spikes and precipitation types in real-time.

35) Which of the following statements best describes the geographical orientation of Armenia?

- (a) It is located between the Black Sea and the Caspian Sea, bordering both.
- (b) It is a mountainous country in the Armenian Highland of the South Caucasus.
- (c) It is a coastal nation on the Mediterranean Sea, separated from Turkey by the Taurus Mountains.
- (d) It is a desert nation in the Middle East, sharing borders with Iraq and Syria.

Solution: B

- Armenia's geography is defined by its landlocked status and high elevation.
- Option (b) is the correct description. Armenia is situated in the **South Caucasus** (also known as Transcaucasia) and lies entirely on the **Armenian Highland**. It has an average elevation of about 1,800 meters, making it one of the most mountainous countries in the region. The landscape is dominated by the Lesser Caucasus ranges and is volcanic in origin, leading to mineral-rich but stony soils.
- Option (a) is incorrect because while Armenia is located between the Black Sea and the Caspian Sea, it is **landlocked** and does not border either body of water.
- Option (c) is incorrect as Armenia has no coastline on the Mediterranean; it is separated from it by Turkey.
- Option (d) is incorrect as Armenia is not a desert nation and does not share borders with Iraq or Syria; its southern neighbor is Iran. The country's climate is continental, with sharp variations based on altitude. Its location at the intersection of Europe and Asia has made it a focal point for history and modern geopolitics, particularly regarding its borders with Georgia, Azerbaijan, and Turkey.

36) Match the contaminant with its primary source:

Contaminant	Source
A. Arsenic	1. Agricultural Runoff
B. Nitrates	2. Industrial Discharge
C. Heavy Metals	3. Geogenic

Select the correct match:

- (a) A-2, B-3, C-1
- (b) A-3, B-1, C-2
- (c) A-2, B-1, C-3
- (d) A-1, B-2, C-3

Solution: B

- **Arsenic (A)** contamination in India is primarily **geogenic (3)**, meaning it occurs naturally in the earth's crust. It gets mobilized into Gangetic aquifers due to groundwater pumping.
- **Nitrates (B)** are a major contaminant from **agricultural runoff (1)**. The overuse of nitrogen-based fertilizers in farming leads to the leaching of nitrates into the groundwater.
- **Heavy Metals (C)** such as lead, cadmium, and mercury are typically released from **industrial discharge (2)**. Industrial processes often produce wastewater laden with these toxic metals, which can seep into and contaminate groundwater sources.

37) Consider the following statements:

Statement I: Living Root Bridges are considered more resilient than modern steel bridges in the Meghalayan plateau.

Statement II: Living Root Bridges can withstand extreme floods and storms that would typically destroy conventional infrastructure.

Statement III: The bridges take approximately 10 to 15 years to become functional but can last for centuries.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Solution: A

- **Statement I is correct.** In the context of the Meghalayan plateau, which experiences some of the highest rainfall in the world, traditional wooden or modern steel structures are prone to rotting or being swept away by flash floods. Living Root Bridges are recognized as being more resilient.

- **Statement II is correct and explains Statement I.** The biological nature of the bridge allows it to be deeply anchored in the soil on both banks. Because the roots are alive and flexible, they can absorb the impact of **extreme floods and storms** without breaking. This resilience is what makes them superior to "dead" infrastructure in this specific high-moisture environment.
- **Statement III is also correct and explains Statement I.** The durability of these bridges is a key factor in their resilience. While a modern bridge has a finite lifespan and requires constant maintenance to prevent rust or decay, a root bridge **takes 10-15 years to grow** but then lasts for **centuries** (some are over 500 years old).
- The fact that they "mature" and "strengthen" over time rather than weakening makes them a more stable long-term infrastructure solution for the tribal communities. Therefore, both their immediate ability to withstand storms (II) and their long-term structural integrity (III) explain why they are considered more resilient (I).

38) Consider List-I (Tributary) and List-II (Main River):

List-I (Tributary)	List-II (Main River)
A. Markandeya	1. Pennaiyar
B. Bhavani	2. Cauvery
C. Pambar	3. Pennaiyar

How many of the above pairs are correctly matched?

- Only one
- Only two
- All three
- None

Solution: C

- **Markandeya (A)** is a major tributary of the **Pennaiyar River (1)**. It is currently at the heart of the inter-state water dispute between Karnataka and Tamil Nadu, specifically regarding the construction of dams.
- **Bhavani (B)** is a well-known tributary of the **Cauvery (2)**, often confused with Pennaiyar because they share the same geographical region of Southern India.
- **Pambar (C)** is another significant tributary of the **Pennaiyar (3)**.
- The Pennaiyar (also known as Thenpennai or Dakshina Pinakini) originates in the **Nandi Hills** of Karnataka and flows through Tamil Nadu into the Bay of Bengal. It is a seasonal river, and its water security is crucial for districts like Krishnagiri and Cuddalore.

39) In the context of the Indian economy and Central Public Sector Enterprises (CPSEs), which one of the following is the primary objective of granting 'Miniratna' status to companies like Yantra India Limited?

- To prepare the CPSE for immediate privatization through strategic disinvestment.
- To mandate the inclusion of at least five Cabinet Ministers on the Board of Directors.
- To ensure that the CPSE receives 100% of its capital expenditure from the Union Budget.
- To provide enhanced financial and operational autonomy for better global competitiveness.

Solution: D

- The 'Miniratna' scheme was introduced by the Government of India in 1997 to identify and empower efficient and profit-making CPSEs. **The primary objective (Option d)** is to decentralize decision-making and provide these enterprises with greater **financial and operational autonomy**. This allows them to respond more effectively to market signals and compete both domestically and internationally without seeking government approval for every capital investment.
- Granting Miniratna Category-I status to **Yantra India Limited (YIL)** signifies that the government recognizes its potential for growth. For a CPSE to be eligible, it must have made profits continuously for the last three years and have a positive net worth. Furthermore, it must not depend on budgetary support or government guarantees for its operations.

- By granting this status, the board is empowered to incur capital expenditure on new projects or modernization up to **₹500 crore or their net worth**, whichever is less. This shift from centralized control to board-level empowerment is a hallmark of India's public sector reforms aimed at improving the efficiency of state-owned assets.

40) Consider the following statements:

Statement I: Western Disturbances play a critical role in the water security of North India during the summer months.

Statement II: The snowfall brought by Western Disturbances in the Himalayas acts as the primary source for perennial rivers.

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

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

Solution: A

- Statement I is correct.** Even though Western Disturbances (WDs) occur in winter, their impact is felt throughout the year, especially regarding **water security** in the summer. The North Indian plains are heavily dependent on rivers like the Ganga, Yamuna, and Indus for irrigation and drinking water during the hot, dry months before the monsoon arrives.
- Statement II is correct and provides the explanation for Statement I.** The precipitation from WDs in the higher altitudes of the **Western Himalayas** (J&K, Himachal, Uttarakhand) falls mostly as **snow**. This snow accumulates and feeds the **Himalayan glaciers**. During the spring and summer, this snow and ice melt, providing a steady discharge into the perennial river systems. Without the winter snowfall provided by WDs, these glaciers would recede faster, and the river levels would drop significantly during the summer, leading to severe water crises.
- Thus, the winter moisture brought from the Mediterranean region is "stored" as ice and released when the plains need it most. This connection highlights the ecological and economic importance of WDs beyond just immediate winter rainfall for crops.

41) Consider the following pairs:

Mountain Range	Location
1. Marrah Mountains	Darfur
2. Red Sea Hills	Eastern Sudan
3. Nuba Mountains	South Kordofan

How many of the above pairs are correctly matched?

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

Solution: C

- Marrah Mountains:** This range of volcanic peaks is located in the **Darfur region** of western Sudan. It is the highest point in Sudan and forms the Nile-Congo watershed. The region has been at the center of the conflict in Darfur.
- Red Sea Hills:** This mountain range runs parallel to the Red Sea coast in **eastern Sudan**. It is an uplifted escarpment with rugged terrain and is an important geographical feature of the region.

3. **Nuba Mountains:** These mountains are located in the **South Kordofan** state of Sudan. They are a series of inselbergs (isolated rock hills) rising from the surrounding clay plains. The Nuba Mountains have also been a site of conflict and are known for their unique cultural diversity.
- 42) The difficulty in predicting cloudbursts is NOT attributed to which of the following factors?
- The high cost associated with advanced forecasting models.
 - The large geographical area over which they occur.
 - The lack of dense meteorological infrastructure in hilly regions.
 - The short duration of the event.

Solution: B

- The prediction of cloudbursts is a significant challenge for meteorologists due to several factors. These include their **short duration**, typically lasting less than an hour, which leaves a very small window for detection and warning.
- Furthermore, the **inadequate infrastructure**, such as a sparse network of Doppler radars and weather stations in the topographically complex and remote hilly areas where these events are most common, limits real-time monitoring capabilities.
- The **high cost** of installing and maintaining advanced radar systems and running sophisticated AI-based forecasting models is also a major barrier.
- However, the statement that they occur over a **large geographical area** is incorrect. In fact, the opposite is true. Cloudbursts are characterized by their **small spatial scale**, with the intense rainfall concentrated over a very limited area (typically 20–30 sq km, and sometimes as small as 1 sq km).

4. Government Schemes and Programmes

- 1) Consider the following statements regarding the Ayushman Sahakar Scheme:
- The scheme is only applicable to cooperative societies that operate within the territorial jurisdiction of a single state.
 - It excludes the funding of AYUSH services as they are covered under a separate Ministry of AYUSH scheme.
 - The interest rebate for women-majority cooperatives is a permanent, unconditional grant provided at the start of the project.

How many of the above statements are correct?

- Only one
- Only two
- All three
- None

Solution: D

- Statement 1 is incorrect** because the scheme is open to cooperatives registered under **either** the State Acts or the **Multi-State Cooperative Societies Act**. This ensures a wide reach across the country.
- Statement 2 is incorrect** because one of the core aims of Ayushman Sahakar is to **strengthen the AYUSH sector**. It specifically provides financial assistance for AYUSH hospitals and services, aligning with India's integrative healthcare model. It does not exclude them; it actively promotes them.
- Statement 3 is incorrect** because the **1% interest rebate** for women-majority cooperatives is not an unconditional grant. It is a rebate on the loan interest, and it is subject to **timely repayment compliance**. If the society defaults, they may lose the incentive. This structure ensures fiscal discipline while promoting **women's empowerment** in the healthcare sector. The scheme overall is designed to be a loan-based assistance program (up to 90% funding) implemented by the **NCDC**, aiming to make healthcare community-owned and affordable.

2) With reference to the Ayushman Sahakar Scheme, consider the following statements:

1. The scheme provides financial assistance for the establishment of hospitals and medical colleges by cooperative societies.
2. It covers the working capital requirements for healthcare facilities but does not provide loans for modernization or digital health infrastructure.
3. The National Cooperative Development Corporation (NCDC) acts as the sole funding agency, providing loans up to 90% of the project cost.
4. The scheme is specifically designed to strengthen the AYUSH sector in line with the National Health Policy 2017.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: C

- **Statement 1 is correct**; the scheme is comprehensive and supports the creation of hospitals, medical colleges, and diagnostic centers by cooperatives.
- **Statement 2 is incorrect** because the scheme is highly flexible; it covers **modernization**, digital health, telemedicine, and even insurance services, in addition to working capital. It aims for a "holistic" approach to healthcare.
- **Statement 3 is correct** as the **NCDC** is the implementing agency that provides structured funding (up to 90% loan) through state governments or directly to the societies, depending on the collateral and security mechanisms.
- **Statement 4 is correct** as one of the primary aims of Ayushman Sahakar is to boost the **AYUSH sector** (Ayurveda, Yoga, Unani, Siddha, and Homeopathy). By integrating traditional medicine into the cooperative healthcare model, the government aligns with the **National Health Policy 2017**'s goal of achieving universal health coverage. The scheme promotes **community ownership**, making healthcare more accountable to the local population. It represents a significant step in **cooperative federalism**, where the central agencies empower grassroots institutions to deliver essential services.

3) Consider the following statements regarding the Ayushman Sahakar Scheme:

1. The scheme is a central sector initiative implemented by the National Health Authority (NHA) to integrate cooperatives into the Ayushman Bharat ecosystem.
2. It provides financial assistance only to those cooperative societies that are registered under the Multi-State Cooperative Societies Act.
3. The scheme includes a specific financial incentive in the form of an interest rebate for cooperatives where women hold a majority ownership.

How many of the above statements are correct?

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

Solution: A

- The Ayushman Sahakar Scheme is a unique initiative designed to bridge the gap between cooperative societies and healthcare infrastructure.
- **Statement 1 is incorrect** because while it aligns with the National Health Policy 2017, it is implemented by the **National Cooperative Development Corporation (NCDC)**, not the NHA. The NCDC functions under the administrative control of the **Ministry of Cooperation**.

- **Statement 2 is incorrect** because the eligibility criteria are broad; any cooperative society registered under either the **State Cooperative Societies Act** or the **Multi-State Cooperative Societies Act** can apply, provided their bye-laws contain provisions for healthcare services.
 - **Statement 3 is correct** as the scheme specifically incentivizes women's participation in the cooperative sector. It offers a **1% interest rebate** to women-majority cooperatives to encourage community-owned healthcare delivery. The scheme provides term loans for up to 8 years with a moratorium of 1-2 years. It signifies a move toward **decentralized healthcare**, focusing on holistic and affordable services.
 - By leveraging the vast network of cooperatives, the government aims to strengthen **AYUSH services** and digital health participation, particularly in rural areas where traditional infrastructure may be lacking.
- 4) With reference to the Export Promotion Mission (EPM), consider the following statements:
1. It is a flagship initiative implemented by the Ministry of Micro, Small and Medium Enterprises.
 2. The mission adopts a dual framework consisting of 'Niryat Protsahan' and 'Niryat Disha'.
 3. It provides financial assistance for the establishment of overseas warehousing and e-commerce export hubs.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect** because the **Export Promotion Mission (EPM)** is implemented by the **Department of Commerce**, which falls under the Ministry of Commerce and Industry, not the Ministry of MSME. Although its primary beneficiaries are MSMEs, the administrative control lies with the commerce department to align with global trade policies.
 - **Statement 2 is correct** as the mission utilizes a **dual framework—Niryat Protsahan** (financial enablers) and **Niryat Disha** (ecosystem support)—monitored through digital systems.
 - **Statement 3 is correct** because the EPM includes specific logistics support components like **FLOW and LIFT**, which facilitate overseas warehousing and the development of e-commerce export hubs to help Indian goods reach international markets more efficiently.
 - The mission aims to reduce structural barriers such as high logistics costs and compliance challenges (via the TRACE component), ensuring that Indian MSMEs become globally competitive. By offering interest subventions and credit guarantees, it addresses the "cost of capital" issue that frequently hinders small-scale exporters.
- 5) Consider the following statements regarding the SANKALP scheme:
1. It is a centrally sponsored scheme launched to improve the quality of long-term vocational training provided by Industrial Training Institutes (ITIs).
 2. The scheme is implemented with loan assistance from the World Bank.
 3. It utilizes Disbursement Linked Indicators (DLIs) to link funding with performance outcomes.

How many of the above statements are incorrect?

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

Solution: A

- **Statement 1 is incorrect** because **SANKALP (Skill Acquisition and Knowledge Awareness for Livelihood Promotion)** focuses specifically on **short-term skill training** rather than long-term vocational training at ITIs (which is often covered under the STRIVE project). Its goal is to strengthen the institutional mechanism for skill development at the state and district levels.

- **Statement 2 is correct**; the scheme is a **World Bank loan-assisted** project under the **Ministry of Skill Development and Entrepreneurship (MSDE)**.
 - **Statement 3 is correct** as SANKALP introduces a result-oriented approach using **Disbursement Linked Indicators (DLIs)** and a Results Framework. This ensures that funds are released only when specific, verifiable milestones in institutional strengthening and inclusion are met.
 - The scheme emphasizes the inclusion of marginalized groups and seeks to build a demand-driven skill ecosystem by fostering stronger industry linkages. By decentralizing planning to the district level, it attempts to bridge the gap between local skill requirements and the available workforce.
- 6) With reference to the "Vibrant Villages Programme-II", consider the following statements:
1. It exclusively targets villages on the Indo-China border to counter external influence.
 2. The programme is implemented by the Ministry of Home Affairs.
 3. It aims to integrate border populations as active stakeholders in national security.

Which of the above statements are correct?

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

Solution: D

- Statement 1 is incorrect. VVP-I targeted the northern (Indo-China) border. **VVP-II** targets the **other international land borders**, including those with Bangladesh, Nepal, Myanmar, Bhutan, and Pakistan.
 - Statement 2 is correct; the Ministry of Home Affairs is the nodal ministry for border management and the VVP.
 - Statement 3 is correct. The philosophy of the scheme is that a developed, happy, and integrated border population is the best defense. By calling them the "eyes and ears" of the security forces, the government is moving from a purely military approach to a **community-led security model**, where local people have a stake in the peace and stability of the region.
- 7) With reference to the Bharat-VISTAAR platform, consider the following statements:
1. It is a Digital Public Infrastructure (DPI) powered by Artificial Intelligence to provide personalized agricultural advisory.
 2. The platform is accessible solely through a high-speed internet-enabled smartphone application.
 3. It integrates various schemes like PM-KISAN and PMFBY to provide a single digital gateway for farmers.

How many of the above statements are incorrect?

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

Solution: A

- **Statement 1 is correct**; **Bharat-VISTAAR** (Virtually Integrated System to Access Agricultural Resources) is an AI-driven **multilingual DPI** launched to empower farmers with real-time, research-backed information.
- **Statement 2 is incorrect**. A key feature of the platform is **multi-platform accessibility**. It is designed to be inclusive, supporting **basic phones** through a voice-based toll-free helpline (155261) and an AI assistant named "**Bharati**." This ensures that rural farmers without smartphones or high-speed internet can still receive advice.
- **Statement 3 is correct** as the platform acts as a unified gateway, integrating major welfare schemes like **PM-KISAN** (for income support), **PMFBY** (for crop insurance), and the **Kisan Credit Card**. By providing a 24x7 digital expert, it helps farmers check eligibility and track grievances in one place. The platform's initial rollout in Hindi and English, with plans for 11 more languages, underscores its focus on digital inclusion.

8) Consider the following statements regarding the 'PM RAHAT' Scheme:

1. It provides cashless treatment up to ₹1.5 lakh for road accident victims, limited to a duration of 7 days from the date of the accident.
2. The National Health Authority (NHA) provides the policy oversight, while the Ministry of Road Transport and Highways (MoHUA) handles claims processing.
3. The scheme is funded through the Motor Vehicle Accident Fund (MVAf) for insured cases.

How many of the above statements are incorrect?

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

Solution: A

- **PM RAHAT (Road Accident Victim Hospitalization and Assured Treatment)** is a national cashless emergency scheme.
- Statement 1 is correct as it offers financial coverage of **₹1.5 lakh per victim** for a 7-day window, emphasizing the **Golden Hour** intervention.
- Statement 2 is **incorrect**. **MoRTH** provides policy oversight and the **eDAR** platform, while the **NHA** handles claims processing via its **Transaction Management System (TMS 2.0)**.
- Statement 3 is correct regarding the funding mechanism. The **Motor Vehicle Accident Fund (MVAf)** covers insured cases through insurance contributions, while budgetary support handles **uninsured or 'Hit & Run'** cases. This ensures that hospitals have financial certainty, encouraging them to provide immediate, uninterrupted treatment without worrying about payment from the victim.

9) Consider the following statements regarding the NPS Swasthya Pension Scheme:

1. It allows claims to be paid directly to Health Benefit Administrators (HBA) or hospitals.
2. Digital consent of the subscriber is mandatory as per the Digital Personal Data Protection Act, 2023.
3. The scheme provides for a mandatory life insurance cover along with health benefits.

Which of the statements given above are correct?

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

Solution: A

- The **NPS Swasthya Pension Scheme** introduced by **PFRDA** has specific operational and legal safeguards.
- **Statement 1 is correct**; the claim settlement mechanism is designed for efficiency, where medical expenses can be paid **directly to the hospital** or the Third Party Administrator (TPA/HBA), reducing the immediate financial burden on the subscriber.
- **Statement 2 is also correct**; since the scheme involves sensitive health and financial data, **explicit digital consent** is required, strictly adhering to the **Digital Personal Data Protection Act, 2023**.
- **Statement 3 is incorrect**. The scheme focuses on integrating **health financing (OPD/IPD)** with pension savings; it does not mention a "mandatory life insurance cover" as part of the Swasthya pilot. The primary significance of the scheme lies in "**Health–Pension convergence**," allowing retirees to use a portion of their long-term savings for immediate medical needs without liquidating other assets.
- It represents a shift toward **subscriber-centric innovation** in the NPS ecosystem, aimed at reducing out-of-pocket expenditure, which is a leading cause of financial distress for the elderly in India.

10) With reference to the NPS Swasthya Pension Scheme, consider the following statements:

1. It is a mandatory scheme for all existing National Pension System (NPS) subscribers.
2. Partial withdrawals of the subscriber's own contribution are allowed for medical expenses.

3. The scheme is currently being implemented as a pilot project under the PFRDA's Regulatory Sandbox.

How many of the above statements are correct?

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

Solution: B

- The **NPS Swasthya Pension Scheme** is a **voluntary** initiative, not mandatory, making **Statement 1 incorrect**. It is designed to integrate healthcare financing with retirement planning.
- **Statement 2 is correct**; subscribers are permitted to make **partial withdrawals of up to 25%** of their own contributions to cover outpatient (OPD) and inpatient (IPD) medical expenses. Notably, there is **no cap on the number of withdrawals**, provided a minimum corpus of ₹50,000 has been reached.
- **Statement 3 is also correct**. The **Pension Fund Regulatory and Development Authority (PFRDA)** has launched this as a **Proof of Concept (PoC)** under its **Regulatory Sandbox Framework**. This allows for controlled testing of the scheme's technological and operational feasibility before a national rollout.
- The scheme aims to reduce **out-of-pocket expenditure (OOPE)**, which is a major cause of medical impoverishment in India. It also includes a **"Critical Illness Protection"** feature where a subscriber can exit prematurely with a 100% lump sum if a single treatment cost exceeds 70% of the corpus.

11) The establishment of NITI Aayog reflected a paradigm shift from the erstwhile Planning Commission. Which of the following statements best captures this shift?

1. A shift from a centralized planning approach to a cooperative, bottom-up vision.
2. A transition from having financial allocation powers to being a purely advisory body.
3. A change in composition to include Chief Ministers and Lieutenant Governors to better reflect the federal structure.

Select the correct answer using the code given below:

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

Solution: D

- **Statement 1 is correct**. NITI Aayog was explicitly created to act as a platform for **cooperative federalism**, encouraging states to be active partners in policy formulation and national development, reflecting a "bottom-up" approach.
- **Statement 2 is correct**. The Planning Commission had the significant power to **allocate plan funds** to states, giving it considerable leverage. NITI Aayog has no such financial powers. It is a **purely advisory body** or a think-tank. The power to allocate funds now rests with the Ministry of Finance.
- **Statement 3 is correct**. The primary governing body of the Planning Commission was the National Development Council (NDC). While Chief Ministers were part of the NDC, the creation of the **Governing Council in NITI Aayog**, with the Prime Minister as chair and all Chief Ministers and LGs as members, was designed to be more inclusive and directly embed the federal structure into the institution's core, making it a more effective platform for Centre-State deliberation.

12) Match the following Implementing Agencies (IAs) of the Central Sector Scheme for FPOs with their specific functional domains:

Column A (Agency)	Column B (Primary Domain)
1. SFAC	(i) Cooperative sector development
2. NABARD	(ii) Agricultural marketing and forward linkages
3. NCDC	(iii) Agribusiness and small farmer integration

Column A (Agency)	Column B (Primary Domain)
4. NAFED	(iv) Rural and agricultural credit/refinancing

Select the correct answer using the code given below:

- (a) 1-(iii), 2-(iv), 3-(i), 4-(ii)
- (b) 1-(ii), 2-(i), 3-(iv), 4-(iii)
- (c) 1-(iv), 2-(iii), 3-(ii), 4-(i)
- (d) 1-(i), 2-(ii), 3-(iii), 4-(iv)

Solution: A

- The **Central Sector Scheme for the Formation and Promotion of 10,000 FPOs** utilizes a multi-agency approach to ensure wide reach and specialized support.
- **Small Farmers' Agribusiness Consortium (SFAC)** (1-iii) is the lead agency for integrating small farmers into agribusiness value chains.
- **NABARD** (2-iv) focuses on providing the necessary **credit support, refinancing, and rural development** frameworks to make FPOs bankable. The **National Cooperative Development Corporation (NCDC)** (3-i) specializes in the **cooperative sector**, helping farmers form collectives under cooperative laws.
- Finally, **NAFED** (4-ii) is instrumental in providing **market linkages, forward integration**, and ensuring that the produce reaches the consumer effectively, reducing the role of exploitative middlemen. This synergy allows the scheme to address different facets of the agricultural crisis—**access to inputs, credit, and markets**.
- The scheme, launched on **29 February 2020**, has reached the milestone of 10,000 FPOs, significantly involving **women farmers** (21.96 lakh) and focusing on **Aspirational Districts**. By leveraging these diverse agencies, the government ensures that FPOs are not just formed but are nurtured to become sustainable business entities.

13) In the context of the Economic Survey 2026, which of the following is the primary responsibility of the Chief Economic Advisor (CEA)?

- (a) Authoring the Union Budget and Tax Proposals
- (b) Managing the disinvestment of Public Sector Undertakings
- (c) Determining the Repo Rate and Inflation Targets
- (d) Providing overall guidance for the preparation of the Economic Survey

Solution: D

- The **Chief Economic Advisor (CEA)** is a high-ranking official in the Ministry of Finance. While the **Economic Survey** is technically prepared by the **Economics Division of the Department of Economic Affairs**, it is authored under the **overall guidance and leadership of the CEA**. The CEA serves as a bridge between economic theory and government policy, providing an objective analysis of the economy's health.
- The **Union Budget** is primarily the responsibility of the **Budget Division** and the Department of Revenue; the **Repo Rate and Inflation Targets** are the domain of the **Monetary Policy Committee (MPC)** of the RBI; and **disinvestment** is managed by the **Department of Investment and Public Asset Management (DIPAM)**.
- The 2026 Survey, presented by **V. Anantha Nageswaran**, acts as a "report card" of the previous 12 months and is a crucial document for understanding the government's perspective on fiscal health and structural reforms.

14) With reference to the SabhaSaar Initiative, consider the following statements:

1. It is a generative AI platform developed to provide real-time translation of parliamentary proceedings in the Rajya Sabha.
2. The initiative is a collaborative effort between the Ministry of Panchayati Raj and the IndiaAI Mission.
3. It is designed to automatically generate structured Minutes of Meetings (MoM) from Gram Sabha recordings.

How many of the above statements are incorrect?

- (a) Only one
- (b) Only two
- (c) All three

(d) None

Solution: A

- The **SabhaSaar Initiative** is an **AI-powered voice-to-text and meeting summarisation platform** specifically designed for **Gram Sabhas** and Panchayat meetings, not for the Rajya Sabha or Parliament (Statement 1 is incorrect).
- It was launched in August 2025 to digitize and standardize documentation at the grassroots level. The **Ministry of Panchayati Raj** serves as the nodal implementing ministry, while the **IndiaAI Mission** under MeitY provides the necessary AI and cloud infrastructure (Statement 2 is correct).
- The core functionality of SabhaSaar is to convert audio/video recordings of local body discussions into structured **Minutes of Meetings (MoM)**, capturing key decisions and resolutions (Statement 3 is correct).
- This initiative aims to enhance transparency and reduce the manual workload of Panchayat officials. It is integrated with **Bhashini**, allowing it to support multiple Indian languages, thus bridging the digital divide in rural governance. By automating the summarization process, it ensures that local governance records are verifiable and consistent with the **Digital Personal Data Protection (DPDP) Act, 2025**.

15) With reference to the Economic Survey of India, consider the following statements:

1. The first Economic Survey was presented in the year 1947–48.
2. It is prepared by the Department of Revenue under the Ministry of Finance.
3. Part B of the survey usually contains data-driven analysis of specific socio-economic issues like health and education.

How many of the above statements are correct?

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

Solution: A

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- **Statement 1 is incorrect;** the first Economic Survey was presented in **1950–51**. Initially, it was part of the Budget documents.
- **Statement 2 is also incorrect** because the survey is prepared by the **Economics Division of the Department of Economic Affairs (DEA)**, not the Department of Revenue. While both departments are under the Ministry of Finance, the DEA is specifically responsible for macroeconomic management and the preparation of the Budget and Survey.
- **Statement 3 is correct.** Historically, the Survey is divided into two volumes or parts. **Part A** focuses on the broader macroeconomic review and the outlook for the next fiscal year, while **Part B** provides a deeper, **data-driven analysis** of specific sectors like health, education, employment, and climate change.
- The Survey has significant **academic and market value**, acting as a blueprint for long-term reforms and a reliable indicator for investors regarding the country's economic stability.

16) The "FAST DS 2026" scheme mentioned in the Union Budget 2026–27 is a:

- (a) Fast-track dispute settlement mechanism for GST-related litigations.
- (b) Scheme for the rapid deployment of solar-powered fishing boats.
- (c) Digital platform for the speedy distribution of seeds to livestock farmers.
- (d) One-time disclosure window for small taxpayers to report foreign assets without prosecution.

Solution: D

- **FAST DS** stands for the **Foreign Assets of Small Taxpayers Disclosure Scheme (2026)**. It is a one-time, **six-month window** introduced as part of the **Income Tax Act, 2025** reforms. It is specifically targeted at individuals like students who have lived abroad or relocated NRIs who may have small overseas assets (under **₹1 crore or ₹5 crore**, depending on the category).

- The scheme provides **immunity from prosecution** to taxpayers who disclose these assets and pay the specified taxes or fees. This is part of a larger effort to rationalize penalties and move away from aggressive litigation. In the same vein, the new Act **decriminalizes technical defaults** and reduces maximum imprisonment for most tax offences to **2 years**. By providing a "safe harbor" for small taxpayers, the government aims to clean up tax records while promoting ease of compliance. This sits alongside other taxpayer-friendly measures like **staggered filing deadlines** and an extended **revised return window** until March 31 of the following year.

17) Regarding the Rare Earth Corridors announced in the Union Budget 2026–27, consider the following statements:

1. These corridors will be established in states that possess significant beach sand mineral deposits.
2. The primary mineral source for rare earths in these coastal corridors is Monazite.
3. The initiative is overseen by the National Industrial Corridor Development Corporation to the exclusion of state-level agencies.

How many of the above statements are correct?

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

Solution: B

- The government announced the establishment of **Rare Earth Corridors** in four coastal states: **Odisha, Kerala, Andhra Pradesh, and Tamil Nadu**.
- Statement 1 is correct because these specific states are rich in **beach sand minerals (BSM)**.
- Statement 2 is also correct as **Monazite**, found in these placer sands, is the principal source of **Light Rare Earth Elements (REEs)** like Neodymium and Praseodymium in India.
- Statement 3 is incorrect. The Rare Earth Corridors represent a shift toward **state-led execution** and industrial clustering. While aligned with the **National Critical Minerals Mission**, the focus is on state-anchored value chains linking mining to manufacturing.
- The corridors are integrated with the **₹7,280 crore Sintered Rare Earth Permanent Magnet (REPM) scheme**, which offers **sales-linked incentives** of ₹6,450 crore. The goal is to reduce India's heavy reliance on imports—over **53,000 MT of magnets** were imported in FY25. By co-locating R&D, processing, and manufacturing, the corridors aim to build a resilient supply chain for high-tech sectors like **EVs and wind turbines**.

5. Science and Technology

- 1) Consider the following statements regarding the new telescopes to be established in India:
1. The National Large Solar Telescope (NLST) will be India's first-ever ground-based observatory dedicated to studying the Sun.
 2. The National Large Optical–Near Infrared Telescope (NLOT) will utilize a segmented-mirror technology, similar to the proposed Thirty Meter Telescope (TMT).
 3. Both telescopes will be located in the Ladakh region to take advantage of the high altitude and minimal atmospheric interference.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect** because the NLST will be India's **third** ground-based solar observatory, following the established facilities at Kodaikanal and Udaipur. It will, however, be significantly more advanced with a 2-metre aperture.
- **Statement 2 is correct**; the NLOT is a massive project featuring a **13.7-metre primary mirror** made of 90 hexagonal segments. This segmented-mirror design is a hallmark of modern large-aperture telescopes and leverages India's experience as a partner in the global **Thirty Meter Telescope (TMT)** project.
- **Statement 3 is correct** because both facilities are slated for Ladakh—NLST at **Merak** (near Pangong Tso) and NLOT at **Hanle**. Ladakh's high altitude, dry climate, and "dark skies" provide the perfect conditions for **observational astronomy**, as there is less atmospheric water vapor and turbulence to distort the light from distant stars or the Sun. These facilities will bolster India's research in **heliophysics**, exoplanets, and cosmology. By observing in visible and near-infrared wavelengths, these telescopes will complement space missions like **Aditya-L1**, providing a comprehensive view of solar and deep-space phenomena.

- 2) With reference to the training of Large Language Models (LLMs), consider the following statements:
1. Pre-training involves feeding the model raw data to learn grammar and reasoning, while Fine-Tuning adapts it for specific professional tasks.
 2. Reinforcement Learning from Human Feedback (RLHF) is primarily used to increase the model's compute intensity and GPU consumption.
 3. Lower layers of a transformer model typically capture intent and reasoning, while higher layers focus on basic grammar and form.

How many of the above statements are correct?

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

Solution: A

- Statement 1 is correct. **Pre-training** on petabytes of data (books, code, websites) gives the model its broad "knowledge" and linguistic base. **Fine-Tuning** then narrows this focus for specialized applications like medical diagnosis or legal drafting.
- Statement 2 is incorrect. **RLHF** is used to make the model **safer and more helpful** by having human testers rank its responses. It is a process for alignment and quality control, not a method to increase compute intensity. In fact, high compute intensity is a *requirement* for the initial training phases due to the billions of **parameters** involved.
- Statement 3 is incorrect. In a transformer architecture, the **lower layers** catch the basic "form" (grammar, syntax, tokens), while the **higher layers** progressively build richer representations of **intent, relationships**,

and reasoning patterns. The final layer then converts these complex insights into a next-token prediction. Understanding this hierarchy is key to indigenous developments like **Sarvam AI's** models, which aim to provide sovereign AI capabilities for India.

- 3) Which biotechnology technique is used to increase the shelf life of food products?
- Molecular diagnostics
 - Gene therapy
 - Edible vaccines
 - Tissue culture

Solution: D

Tissue culture is a technique used in biotechnology to regenerate disease-free plants in laboratories, ensuring the production of high-quality planting materials. **It also plays a crucial role in extending the shelf life of food products** by producing plants with desirable traits, reducing waste, and ensuring access to fresher produce. This application is critical for improving food security and reducing post-harvest losses.

- 4) Consider the following statements regarding White phosphorus.
- White phosphorus is a highly toxic, wax-like substance known for its ability to burn at extremely high temperatures.
 - It is used by militaries to create smokescreens due to its fast-spreading fires and thick smoke production.
 - It is categorized as an “incendiary weapon” and is banned by international conventions.

Which of the above statements are correct?

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1, 2 and 3

Solution: A

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About White phosphorus:

- It is a **highly toxic, wax-like substance known for its ability to burn at extremely high temperatures**, exceeding 800 degrees Celsius (1,500 degrees Fahrenheit).
- It can **melt metal and is often used by militaries to create smokescreens** due to its **fast-spreading fires and thick smoke production** that can last for about seven minutes.
- White phosphorus is harmful to **humans and can cause severe burns, penetrating down to the bone**. The **chemicals can be absorbed by the body, leading to dysfunction in multiple organs**, including the **liver, kidneys, and heart**
- White phosphorus munitions can be delivered through artillery shells, bombs, rockets, or grenades. This substance is colourless, white, or yellow and emits a garlic-like odour.

While white phosphorus is not banned by international conventions, it is not categorized as an “incendiary weapon” intended to cause fires or burns.

Instead, it is considered a multipurpose munition. Protocol III of the 1980 Convention on Certain Conventional Weapons prohibits incendiaries or the use of other substances to attack civilian populations, but it allows militaries to argue that white phosphorus is used only as a smokescreen, signal, or to illuminate a target.

- 5) Consider the following statements regarding the 'Pax Silica' initiative:
- It aims to reduce risks from coercive or monopolistic supply chains in the semiconductor and AI sectors.
 - It was conceptualized as a response to the concentration of rare-earth processing in certain geographies.
 - The initiative specifically excludes private sector participation to maintain inter-governmental security protocols.

Which of the statements given above is/are correct?

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

Solution: C

- **Statement 1 is correct**; the primary objective of **Pax Silica** is to build **resilient and diversified** global supply chains for critical minerals and semiconductors, protecting against economic coercion.
- **Statement 2 is correct** as it was conceptualized to address the **concentration of rare-earth processing**, which is currently dominated by a few countries, posing a strategic risk to global technology manufacturing.
- **Statement 3 is incorrect** because the initiative actively **mobilizes private sector participation**. It recognizes that innovation and scaling in AI and semiconductors are driven by entrepreneurship and industry capabilities, and thus seeks to align private investment with the strategic economic security goals of the partner nations. By building a "trusted innovation ecosystem," Pax Silica encourages collaboration among governments, industries, and innovators to create secure technology stacks.

6) Consider the following statements regarding the Tetanus and Diphtheria (Td) vaccine:

1. It is a primary vaccine administered only to infants below the age of one year.
2. It acts as a booster dose to maintain long-term immunity as protection from childhood vaccination declines.
3. The Tdap variant of the vaccine provides additional protection against pertussis.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect** because the **Td vaccine** is primarily a **booster immunization** administered to adolescents and adults (usually every 10 years) rather than being a primary infant-only vaccine. Primary immunization in infancy usually involves the DPT or pentavalent vaccine.
- **Statement 2 is correct**; the purpose of Td is to **reinforce immunity** against tetanus and diphtheria because the protection acquired through childhood shots fades over time.
- **Statement 3 is correct**; **Tdap** is a variant that includes protection against **pertussis (whooping cough)** in addition to tetanus and diphtheria. It is specifically recommended for pregnant women to provide passive immunity to the newborn.
- The recent launch of the Td vaccine at Kasauli highlights the government's focus on strengthening the national immunization program beyond early childhood, ensuring that the adult population remains protected against these toxin-mediated bacterial diseases.

7) Consider the following statements:

Statement I: Diphtheria is a highly contagious bacterial infection that can cause a thick grey coating in the throat.

Statement II: Diphtheria spreads primarily through contaminated soil and animal waste entering through open wounds.

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

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

(d) Statement-I is incorrect but Statement-II is correct

Solution: C

- **Statement I is correct.** **Diphtheria** is caused by the bacterium *Corynebacterium diphtheriae*, which produces a toxin that leads to a characteristic **thick grey pseudomembrane** in the throat, potentially blocking the airway.
- **Statement II is incorrect** because it describes the transmission mode of **Tetanus**, not Diphtheria. Diphtheria spreads mainly through **respiratory droplets** (coughing or sneezing) from an infected person.
- In contrast, Tetanus (*Clostridium tetani*) is not contagious from person to person; its spores are found in **soil, dust, and animal waste** and enter the human body through cuts or puncture wounds. This distinction is critical for public health strategies: while Diphtheria requires respiratory precautions and community-wide vaccination to prevent outbreaks, Tetanus requires individual wound management and booster shots as it is an environmental pathogen.

8) With reference to Tetanus, consider the following statements:

1. It is caused by a virus that thrives in anaerobic conditions.
2. The disease is characterized by severe muscle stiffness and spasms, often referred to as "lockjaw."
3. Tetanus can be effectively prevented through timely vaccination as it cannot be cured once the toxins bind to nerve endings.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect** because Tetanus is a **bacterial disease** caused by *Clostridium tetani*, not a virus. However, it does thrive in **anaerobic (oxygen-poor) conditions**, such as deep puncture wounds.
- **Statement 2 is correct**; the toxins produced by the bacteria affect the nervous system, leading to painful **muscle contractions**, particularly in the jaw and neck (hence "**lockjaw**").
- **Statement 3 is correct.** While medical treatment exists to manage symptoms and neutralize unbound toxins, the damage caused by toxins already bound to nerve endings is difficult to reverse, making **preventive vaccination** the most effective strategy.
- This highlights the importance of the Td booster shots every 10 years to maintain a high level of circulating antibodies that can neutralize the toxin immediately upon infection.

9) Consider the following statements regarding the SAHI (Strategy for Artificial Intelligence in Healthcare for India) initiative:

1. It is a national governance framework aimed at the responsible adoption of AI within the Indian healthcare sector.
2. The framework mandates that all AI-driven healthcare solutions must operate independently of the Ayushman Bharat Digital Mission (ABDM) to ensure data silos for security.
3. It provides a policy roadmap for both Union and State levels to ensure uniform standards in AI regulation.

Which of the above statements are correct?

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

Solution: D

- The **SAHI** (Strategy for Artificial Intelligence in Healthcare for India) initiative is a cornerstone of India's digital health evolution.
- **Statement 1 is correct** as it serves as a governance framework and policy compass for ethical, transparent, and people-centric AI adoption.
- **Statement 3 is correct** because SAHI establishes clear guidelines for both the Union and State governments to prevent fragmented regulations and ensure uniform healthcare standards across India.
- However, **Statement 2 is incorrect**. A key feature of SAHI is its **focus on interoperability**. Rather than creating silos, it ensures that AI solutions integrate seamlessly with existing digital infrastructure, specifically the **Ayushman Bharat Digital Mission (ABDM)** platforms. This integration is vital for creating a holistic digital health ecosystem where data can flow securely between providers and patients.
- The initiative emphasizes **ethical AI standards**, including consent-based data usage and transparency in algorithms to mitigate bias. By fostering multi-stakeholder collaboration among startups, academia, and the government, SAHI aims to align technological innovation with national public health priorities, ensuring that AI serves as a tool for inclusive development rather than an unregulated technological experiment.

10) Consider the following statements regarding the "Drogue Parachute" technology:

1. These parachutes are designed to function effectively under supersonic speeds and rapid turbulence.
2. Unlike main parachutes, drogues have a lower surface area to provide controlled deceleration without shredding.
3. In the Gaganyaan mission, they are deployed before the apex cover is separated.

Which of the statements given above are correct?

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

Solution: D

- Statement 1 and 2 are correct. **Drogue parachutes** are "workhorses" designed for the harshest part of the descent. They have a smaller surface area (often with a ribbon design) so that the air resistance doesn't tear them apart at high speeds. This allows for **controlled deceleration**, bringing the craft to a speed where the much larger, more fragile Main parachutes can be safely deployed.
- Statement 3 is incorrect. The sequence is vital: the **Apex Cover Separation Parachutes** must deploy first to remove the protective cover of the module's parachute bay. Only after this cover is gone can the Drogues be deployed. Reversing this order would lead to a deployment failure.

11) Consider the following statements:

Statement-I: Agni-3 missile provides India with a reliable second-strike capability.

Statement-II: The Agni-3 is a road-mobile, canisterised missile system that enhances the survivability of the nuclear deterrent.

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

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

Solution: A

- **Statement-I is correct** because the primary objective of the Agni series, particularly the IRBM and ICBM variants, is to maintain a **credible minimum deterrence** and ensure a **second-strike capability**. This means India can respond with devastating force even after an initial nuclear attack.

- **Statement-II is also correct** and provides the logical reasoning for Statement-I. Survivability is the most critical factor for a second-strike capability. Because Agni-3 uses a **road-mobile launcher** (and has tested **canisterised variants**), it can be moved across the country's vast road network and hidden from enemy satellite surveillance. This mobility makes it difficult for an adversary to neutralize India's missile force in a "first strike."
- The transition to **solid fuel** and canisterisation allows for "fire-and-forget" readiness, as the missile is kept in a sealed environment and can be launched on short notice. By ensuring that the delivery systems survive an initial attack, the Agni-3 maintains the credibility of India's **no-first-use (NFU)** policy, as the deterrent remains functional to strike back.

12) Which one of the following best describes the fundamental operational difference between a Graphics Processing Unit (GPU) and a Central Processing Unit (CPU)?

- (a) GPUs are designed to handle fewer complex sequential tasks, whereas CPUs excel at repetitive, data-intensive computations.
- (b) GPUs utilize a parallel architecture to perform thousands of independent calculations simultaneously, unlike the sequential focus of CPUs.
- (c) CPUs rely on specialized Tensor cores for rendering, while GPUs use CUDA cores for general-purpose operating system management.
- (d) GPUs process data using a compute pipeline that converts geometric shapes into pixels, a task that CPUs cannot perform.

Solution: B

- The core distinction between a GPU and a CPU lies in their architecture and the type of tasks they are optimized for. **Option (b) is the correct answer.** A CPU is often called the "brain" of the computer, designed to handle a wide range of complex, sequential logic and branch operations.
- In contrast, a **GPU (Graphics Processing Unit)** is built for **parallel processing**. It contains hundreds or thousands of smaller, more specialized cores (like CUDA or Tensor cores) that can handle "embarrassingly parallel" workloads—tasks where thousands of independent, simple calculations can be done at the same time.
- While CPUs can perform graphics tasks, they are significantly slower at it because they lack the parallel bandwidth of a GPU. The **rendering pipeline** (vertex processing, rasterization, shading) mentioned in option (d) is a process GPUs use, but saying CPUs *cannot* perform these tasks is technically inaccurate; they just do so inefficiently.
- In the context of **Artificial Intelligence**, GPUs are indispensable because modern neural networks rely on massive **matrix multiplications**. The high memory bandwidth (GDDR6X/HBM3) of GPUs allows them to move the massive datasets required for Large Language Models (LLMs) far more effectively than traditional CPUs.

13) The "India Energy Stack" mentioned in the context of the AI-for-Energy mission is most similar in its design philosophy to which of the following?

- (a) The Unified Payments Interface (UPI)
- (b) The National Pension System (NPS)
- (c) The Pradhan Mantri Jan Dhan Yojana (PMJDY)
- (d) The Goods and Services Tax Network (GSTN)

Solution: A

- The **India Energy Stack** is explicitly described as a "digital public infrastructure model" that is **interoperable** and designed to connect various stakeholders (consumers, vendors, utilities). **Option (a) is the correct answer.** Much like how the **Unified Payments Interface (UPI)** provides a common, open-standard platform that allows different banks and payment apps to talk to each other, the Energy Stack provides a template for connecting a decentralized energy grid.
- This philosophy of building "digital public goods" allows for rapid innovation and scaling. In the AI-for-Energy mission, the ISA uses this template to help 120+ member countries digitalize their grids. By having an

interoperable platform, a country can manage millions of small solar installations (prosumers) more effectively. This avoids "vendor lock-in" where a country becomes dependent on a single company's proprietary technology.

- The stack facilitates things like the **One Solar App** for net-metering and **Digital Twin** simulations, making it a "global template" for modernizing clean energy infrastructure in developing economies.

14) Which of the following statements is incorrect about how a hydrogen fuel cell works?

- Hydrogen molecules are split into protons and electrons at the anode of the fuel cell.
- Electrons flow from the anode to the cathode through the electrolyte, generating an electric current.
- Water is formed at the cathode by combining protons, electrons, and oxygen from the air.
- The only byproducts of the fuel cell reaction are water vapor and heat.

Solution: B

In a hydrogen fuel cell, **hydrogen molecules are split into protons and electrons at the anode** (Statement a). The electrons do not travel through the electrolyte; instead, they flow from the **anode to the cathode through an external circuit**, creating an electric current. The electrolyte selectively allows only the protons (positively charged particles) to pass through it to the cathode, ensuring that electrons take the external path to generate usable electricity.

At the **cathode**, protons, electrons, and oxygen from the air combine to form water (Statement c), producing **water vapor and heat as byproducts** (Statement d). This efficient process of generating electricity with minimal byproducts makes hydrogen fuel cells a promising clean energy source.

15) With reference to 6th Generation Aero Engines, what is the main purpose of "Adaptive Cycle" technology?

- To allow the engine to run on both electricity and solar power.
- To enable switching between fuel-saving cruise mode and high-power combat mode.
- To make the engine completely silent during takeoff.
- To automatically repair engine parts mid-flight.

Solution: B

- **Adaptive Cycle Engine (ACE)** technology is a defining feature of 6th generation aero engines. Unlike traditional jet engines that operate in a fixed mode, an ACE can **dynamically shift** its airflow configuration mid-air.
- In **Cruise Mode**, it functions like a high-bypass commercial engine to maximize fuel efficiency and extend the aircraft's range.
- In **Combat Mode**, it closes the extra air stream to provide high thrust and rapid acceleration required for dogfights or supersonic flight. This flexibility ensures that the aircraft is both economical for long-range patrols and powerful during high-intensity missions. These engines also incorporate a **third air stream** to help cool the advanced onboard electronics, such as high-powered radars and laser weapons.

16) Consider the following statements:

Statement I: 6th Generation aero engines are designed to serve as an integrated power and cooling hub for the aircraft's mission systems.

Statement II: Next-generation fighter aircraft require significantly higher electrical power for high-powered radars, electronic warfare suites, and directed-energy weapons.

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

- Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- Statement-I is correct but Statement-II is incorrect
- Statement-I is incorrect but Statement-II is correct

Solution: A

- **Statement I is correct;** unlike 4th or 5th generation engines which were primarily thrust providers, 6th gen engines are multifunctional. They are designed to manage the aircraft's **thermal and electrical loads** in addition to providing propulsion.
- **Statement II is also correct** and serves as the **exact reason** for Statement I. Modern stealth fighters are increasingly being equipped with "energy-hungry" systems like **AESA radars**, sophisticated **Electronic Warfare (EW)** suites, and even **laser weapons** (Directed Energy Weapons). These systems generate immense heat and require massive electrical output. Traditional engines cannot provide this level of power or dissipate the resulting heat efficiently.
- Therefore, 6th-gen engines incorporate **embedded electrical power generation** and advanced cooling streams to ensure the aircraft's "brain" and "sensors" function without overheating or power failure.

17) Consider the following statements:

Statement-I: A private commercial entity based in India planning to launch a satellite constellation is subject to international space law obligations.

Statement-II: The Outer Space Treaty of 1967 holds signatory nations responsible for the space activities of their non-governmental entities.

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

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

Solution: A

- **Statement-I is correct.** Any private entity's space activities are governed by the legal and regulatory framework of its home country, which in turn is bound by its international treaty obligations. Therefore, a private Indian company is indirectly subject to the principles of international space law through India's domestic legal system and its adherence to treaties like the OST. The activities must align with principles of peaceful use, liability, and international cooperation.
- **Statement-II is correct.** Article VI of the Outer Space Treaty is foundational to this principle. It explicitly states that States Parties to the Treaty shall bear international responsibility for national activities in outer space, **whether such activities are carried on by governmental agencies or by non-governmental entities.** This ensures that private commercial activities do not operate in a legal vacuum.
- **Statement-II provides the direct legal reasoning for Statement-I.**

18) With reference to Rubella and its elimination, consider the following statements:

1. A country is declared free of rubella when there is no evidence of endemic transmission of the rubella virus for a period of at least 12 months.
2. India has already achieved its target of eliminating measles and rubella.
3. Many people infected with the rubella virus are asymptomatic, which makes surveillance and control of the disease challenging.

How many of the above statements are correct?

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

Solution: A

- **Statement 1 is incorrect.** To achieve rubella elimination status, a country must demonstrate the **absence of endemic rubella transmission for at least 36 months** (3 years) in the presence of a high-quality surveillance system. A 12-month period is not sufficient.

- **Statement 2 is incorrect.** While India has made significant progress through its Measles-Rubella (MR) vaccination campaign, it has **not yet achieved the goal of eliminating measles and rubella**. Sporadic cases are still reported, and the campaign is ongoing to reach the target.
- **Statement 3 is correct.** A significant challenge in controlling rubella is that **many infections are asymptomatic** or present with very mild symptoms. This means that infected individuals can unknowingly transmit the virus to others, making it difficult to track and contain outbreaks. This underscores the importance of high vaccination coverage to achieve herd immunity.

19) Consider the following statements regarding Sustainable Aviation Fuel (SAF).

Statement-I: The adoption of Sustainable Aviation Fuel (SAF) in India faces significant challenges despite its environmental benefits.

Statement-II: SAF is currently more cost-effective and easier to produce on a large scale than conventional jet fuel.

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

- Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- Statement-I is correct but Statement-II is incorrect
- Statement-I is incorrect but Statement-II is correct

Solution: C

- **Statement-I is correct.** The adoption of SAF in India faces several challenges, including its **high cost**, the difficulty in **collecting feedstock** from dispersed sources, and resistance from airlines due to fears of increased fuel costs. These hurdles need to be addressed for the widespread adoption of SAF.
- **Statement-II is incorrect.** SAF is currently **nearly three times costlier** than conventional jet fuel. The production of SAF also faces challenges in scaling up to meet the demands of the aviation industry. The high cost and production challenges are major impediments to its adoption, not facilitators.

20) With reference to the humanoid robot 'ASC ARJUN', consider the following statements:

- It is an indigenous AI-powered robot developed by the Centre for Artificial Intelligence and Robotics (CAIR), DRDO.
- It is equipped with a Face Recognition System (FRS) to assist the Railway Protection Force (RPF) in station surveillance.
- The robot can perform autonomous patrolling and provide public announcements in multiple regional languages.

How many of the statements given above are correct?

- Only one
- Only two
- All three
- None

Solution: B

- The deployment of **ASC ARJUN** at Visakhapatnam Railway Station marks a significant milestone in Indian Railways' technological integration.
- Statement 1 is incorrect because the robot was **indigenously designed and developed by a dedicated Indian Railways technical team** in Visakhapatnam, rather than DRDO.
- Statement 2 is correct as it features an **AI-based Face Recognition System (FRS)** for intrusion detection and crowd monitoring, which directly assists the **Railway Protection Force (RPF)**.
- Statement 3 is also correct; the robot is capable of **semi-autonomous navigation** for round-the-clock patrolling and can make automated announcements in **English, Hindi, and Telugu**. This initiative aims to optimize manpower and enhance passenger safety through real-time alerts to control rooms. The robot's

ability to recognize emergencies like **fire and smoke** adds a layer of safety at high-footfall stations.

21) With reference to the International Space Station (ISS), consider the following statements:

1. It has been continuously inhabited by humans for over two decades.
2. The station operates through a system where each partner agency is entirely independent and manages its own modules without interdependence.
3. The ESA (European Space Agency) and JAXA (Japan Aerospace Exploration Agency) are among its founding partners.

How many of the above statements are incorrect?

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

Solution: A

- The ISS is a marvel of modular architecture and international diplomacy.
- **Statement 1 is correct**; humans have continuously lived aboard the station since the arrival of **Expedition 1 in November 2000**. This makes it the longest-running era of continuous human presence in Low Earth Orbit.
- **Statement 3 is also correct**; the ISS is a joint project involving NASA, Roscosmos, **ESA, JAXA**, and CSA. These agencies have collaborated for decades to maintain the facility as a microgravity laboratory.
- **Statement 2 is incorrect**. The ISS does not function through independent silos. Rather, it is characterized by **shared governance and high interdependence**. While each partner manages the hardware it provides, the station's core functions—such as power, life support, and propulsion—are integrated across different modules.
- For example, Russian modules often provide propulsion for orbit maintenance, while US segments provide the majority of the electrical power. This interdependence is a core feature of the ISS Intergovernmental Agreement. As the station nears its planned de-orbit in 2030, this collaborative framework will be used to ensure a safe re-entry. The ISS has been a symbol of peaceful cooperation despite shifting geopolitical landscapes on Earth, advancing our understanding of human health in space.

22) Consider the following statements:

Statement-I: Sodium-ion batteries (SiBs) are increasingly viewed as a strategic alternative for India's energy storage needs.

Statement-II: India lacks significant domestic reserves of lithium, making it vulnerable to supply chain disruptions and price volatility in the global market.

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

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

Solution: A

- India is currently re-evaluating its battery strategy to enhance energy security and reduce import vulnerability.
- **Statement-I is correct**; **Sodium-ion battery (SiB)** technology is being prioritized because it relies on materials like sodium, which are abundantly available domestically (from common salt or soda ash). This aligns with India's goals for grid-scale storage and short-range electric mobility.
- **Statement-II is also correct** and serves as the primary justification for Statement-I. India has limited **critical mineral reserves**, specifically lithium, cobalt, and nickel, which are essential for high-performance lithium-ion

batteries. Relying on lithium-ion technology makes the Indian economy susceptible to geopolitical tensions and fluctuations in global mineral prices, often controlled by a few dominant players.

- By shifting focus toward SiBs, India can leverage its domestic manufacturing capacity and abundant raw materials, thereby creating a more **resilient energy infrastructure**. SiBs also offer better safety profiles and lower thermal runaway risks, making them suitable for the Indian climate.
- Thus, the lack of lithium reserves (Statement-II) directly explains why India is pivoting toward sodium-based alternatives (Statement-I).

23) With reference to the International Space Station (ISS), consider the following statements:

1. It is a modular laboratory located in the Geosynchronous Transfer Orbit (GTO).
2. It is a collaborative project involving five space agencies, including the China National Space Administration (CNSA).

Which of the above statements are correct?

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

Solution: D

- The International Space Station (ISS) is one of the most complex international scientific collaborations in history.
- **Statement 1 is incorrect** because the ISS is located in **Low Earth Orbit (LEO)**, not GTO. It orbits at an altitude of approximately 400 km, allowing for microgravity research and continuous human habitation since November 2000.
- **Statement 2 is incorrect** because the five participating space agencies are **NASA (USA), Roscosmos (Russia), ESA (Europe), JAXA (Japan), and CSA (Canada)**. The China National Space Administration (CNSA) is not a partner in the ISS program; China instead operates its own independent space station, Tiangong.
- The ISS serves as a platform for cutting-edge research in human health, materials science, and Earth observation. However, its operational life is nearing its end, with plans for a **controlled de-orbiting in 2030** over a remote ocean area using a dedicated U.S. Deorbit Vehicle. This will mark the end of over three decades of international cooperation in LEO.

24) Consider the following statements regarding Sodium-ion batteries (SiBs):

1. They utilize aluminum as the current collector for both the cathode and the anode.
2. Unlike Lithium-ion batteries, SiBs can be safely transported at a zero percent state of charge.
3. The energy density of SiBs currently exceeds that of high-performance lithium-ion chemistries, making them ideal for long-range electric vehicles.

How many of the above statements are incorrect?

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

Solution: A

- Sodium-ion batteries (SiBs) represent a burgeoning alternative to lithium-ion technology, particularly as India seeks to mitigate its dependence on critical mineral imports. One of the distinct technical advantages of SiBs is the use of **aluminum as a current collector** on both the cathode and the anode sides.
- In contrast, lithium-ion batteries require copper for the anode because lithium reacts with aluminum at low potentials, whereas sodium does not. This substitution not only reduces costs but also simplifies the supply chain.

- Furthermore, SiBs offer enhanced safety during logistics; they can be **discharged to 0V (zero percent state of charge)** for storage and transportation without damaging the battery, a feat not possible with lithium-ion cells due to copper dissolution risks.
 - However, **Statement 3 is incorrect**. A primary limitation of current SiB technology is its **lower energy density** (both specific and volumetric) compared to high-performance lithium-ion counterparts. This makes them less suitable for long-range, high-performance electric vehicles (EVs) at this stage. Instead, they are better positioned for stationary grid storage, short-range mobility, and two/three-wheelers. While they are cost-effective due to the abundance of sodium (from salt or soda ash), their technological maturity is still evolving.
- 25) In the context of modern technology, the term "SaaSocalypse" recently seen in news, is best described as:
- (a) A global cyber-attack targeting cloud-based government databases.
 - (b) The sudden collapse of semiconductor supply chains due to geopolitical tensions.
 - (c) A potential crisis where autonomous AI agents replace traditional Software-as-a-Service layers.
 - (d) The total migration of decentralized finance (DeFi) platforms to centralized regulatory frameworks.

Solution: C

- The term "**SaaSocalypse**" was coined by market analysts to describe a disruptive shift in the tech industry following the rise of **AI agent-based automation**. Traditionally, companies rely on **Software-as-a-Service (SaaS)** platforms like Salesforce or ServiceNow for their workflows.
- However, new AI suites, such as the one launched by **Anthropic**, utilize autonomous agents that can perform end-to-end tasks like contract reviews, data analysis, and compliance monitoring without needing to interface with traditional software (Option c is correct). This "platform bypass" capability means that instead of using a software tool to do a job, an AI agent simply does the job itself.
- This poses an existential threat to the revenue models of established software firms and **IT service outsourcing** industries, particularly in countries like India. The market reaction to these developments—sharp valuation corrections in tech stocks—reflects fears that AI might **disintermediate** software firms rather than just augmenting them.
- This transition from "assistive AI" to "action-taking AI" marks a significant evolution in enterprise technology.

26) Regarding Primary Amoebic Meningoencephalitis (PAM), consider the following statements:

1. It is a contagious disease that can spread from person to person through respiratory droplets.
2. The causative organism, *Naegleria fowleri*, thrives in warm freshwater environments.
3. The infection is primarily contracted by drinking contaminated water.

Which of the above statements are correct?

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

Solution: A

- Primary Amoebic Meningoencephalitis (PAM) is a rare but extremely fatal brain infection.
- **Statement 1 is incorrect** because PAM is **not a contagious disease** and does not spread from one person to another.
- **Statement 2 is correct**, as the causative agent, *Naegleria fowleri*, is a **thermophilic (heat-loving) amoeba** that is typically found in warm freshwater bodies like lakes, rivers, and poorly maintained swimming pools. It can survive in temperatures up to 46°C.
- **Statement 3 is also incorrect**. The infection is not caused by drinking contaminated water. Instead, the amoeba enters the body **through the nose when a person is swimming or diving in contaminated water**. From the nasal passages, the amoeba travels to the brain and causes severe inflammation and destruction of brain tissue. The rapid progression of the disease and the lack of a single effective cure contribute to its high fatality rate.

27) Consider the following pairs:

Mineral	Significance
1. Lithium	Essential for electric vehicle batteries
2. Cobalt	Used in the manufacturing of high-strength alloys
3. Nickel	A key component in stainless steel production

How many of the above pairs are correctly matched?

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

Solution: C

- **Lithium** is a critical component in the manufacturing of rechargeable batteries, which are essential for **electric vehicles (EVs), smartphones, and laptops**. Its high energy density and lightweight nature make it indispensable for modern battery technology.
- **Cobalt** is another crucial element in lithium-ion batteries, but it is also widely used in the production of **high-strength, corrosion-resistant superalloys** used in jet engines and gas turbines.
- **Nickel** is a versatile metal with numerous applications. One of its primary uses is in the production of **stainless steel**, where it imparts strength, ductility, and resistance to corrosion. It is also an important component in certain types of batteries.

28) A patient in a rural sub-Saharan African community presents with fever, headaches, and enlarged lymph nodes. A few months later, the patient develops confusion, poor coordination, and a severely disrupted sleep cycle. Which of the following is the most likely diagnosis and cause?

- (a) Dengue Fever, caused by a virus transmitted by a mosquito.
- (b) Malaria, caused by a protozoan transmitted by a mosquito.
- (c) Human African Trypanosomiasis, caused by a protozoan transmitted by a tsetse fly.
- (d) Rabies, caused by a virus transmitted via a dog bite.

Solution: C

- The progression of symptoms described is a classic presentation of **Human African Trypanosomiasis (sleeping sickness)**.
- The initial symptoms—**fever, headaches, enlarged lymph nodes**—correspond to the first (haemo-lymphatic) stage of the disease, where the parasite is in the blood and lymphatic system. The later onset of **confusion, poor coordination, and a disrupted sleep cycle** are hallmark signs of the second (neurological) stage.

This occurs when the *Trypanosoma* parasite crosses the blood-brain barrier and affects the central nervous system. The location (rural sub-Saharan Africa) and the vector (tsetse fly) are also consistent with the epidemiology of sleeping sickness.

29) Consider the following statements regarding Satellite Internet technology:

Statement I: Geostationary (GEO) satellites are ideal for low-latency applications due to their fixed position relative to the Earth's surface.

Statement II: Low Earth Orbit (LEO) satellites require a large constellation to provide continuous global coverage because of their smaller footprint and rapid movement.

Statement III: The "seamless handover" process is a critical feature for MEO (Medium Earth Orbit) satellite constellations to maintain uninterrupted service for a stationary user.

How many of the above statements are correct?

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

Solution: A

- **Statement I is incorrect.** While **GEO satellites** have a stable position and provide wide coverage from their high altitude (~35,786 km), this great distance results in **high latency** (signal delay). This makes them unsuitable for real-time, low-latency applications like online gaming or video conferencing.
- **Statement II is correct.** **LEO satellites** orbit at a much lower altitude (<2,000 km), resulting in a smaller area of coverage on the ground (a smaller footprint). Because they move rapidly across the sky, a large number of interconnected satellites—a "**mega-constellation**"—is necessary to ensure that as one satellite moves out of a user's range, another is already in position to take over the connection, thus providing continuous service.
- **Statement III is incorrect.** The "seamless handover" process is most critical for **LEO satellite systems**, not MEO, due to their very high speed and short time over any given location. The system must rapidly and automatically switch the user's connection from one satellite to the next to avoid service disruption. While handovers occur in MEO systems, the frequency and speed are far less demanding than in LEO constellations.

30) Consider the following statements regarding the "Moltbook" platform:

1. It is a social media platform that facilitates interaction between AI agents and human users through a Reddit-like structure.
2. The platform has observed "emergent behavior" where AI agents independently form political systems and belief systems.
3. Interactions on the platform are driven by consciousness and predefined scripts developed by major AI labs.
4. Humans can only participate as passive observers and cannot post or comment on the platform.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: B

- **Moltbook** is an **AI-only** social media platform.
- Statement 1 is incorrect because it explicitly excludes human participation in conversations; humans are merely spectators.
- Statement 2 is correct; the platform has drawn global attention because its **AI agents** (powered by models like GPT, Claude, and Gemini) have spontaneously formed **mock religions, cryptocurrencies, and governance models**—a phenomenon known as **emergent behavior**.
- Statement 3 is incorrect; interactions are driven by **probabilistic reasoning** and **context windows**, not consciousness or intent. They are **unscripted**, meaning the evolution of cultural norms and humor occurs without explicit programming.
- Statement 4 is correct; only **authenticated AI agents** can post or comment via APIs. The platform highlights the capabilities of **multi-agent systems** to coordinate and simulate complex societies at scale (reaching over 5 million agents). This raises significant ethical concerns regarding **AI autonomy, alignment, and accountability**, as agents interact and recognize "siblings" based on model lineage without human oversight.

31) The "Biopharma Shakti" initiative, recently in the news, primarily aims to:

- (a) Provide universal health insurance to workers in the pharmaceutical industry.
- (b) Mandate the use of AI in all public sector diagnostic laboratories.
- (c) Strengthen the domestic production of biologics and biosimilars for non-communicable diseases.
- (d) Establish a centralized procurement system for all traditional AYUSH medicines.

Solution: C

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- **Biopharma SHAKTI** (Strategy for Healthcare Advancement through Knowledge, Technology, and Innovation) is a flagship initiative with a **₹10,000 crore outlay** over five years. Its primary focus is addressing **non-communicable diseases** such as cancer, diabetes, and autoimmune disorders. It achieves this by boosting the domestic manufacturing of **biologics and biosimilars**, which are often expensive and imported.
- The initiative includes structural upgrades such as establishing **3 new NIPERs** (National Institutes of Pharmaceutical Education and Research) and creating a network of **1,000 accredited clinical trial sites**. To speed up market entry, the **CDSCO** will be strengthened with a dedicated scientific review cadre. Related bio-economy measures in the budget include the launch of **Bharat-VISTAAR**, an AI tool for agricultural bio-resource management, and the creation of **3 dedicated Chemical Parks**. Furthermore, the budget supports the **WHO Global Traditional Medicine Centre** in Jamnagar to enhance evidence-based research in AYUSH, complementing the Biopharma Shakti's modern medical focus.

32) Match the following:

	List I (Mineral)	List II (Application)	List III (Significance)
A.	Nickel (Ni)	1. Catalytic converters	X. Supports net-zero carbon goals
B.	Copper (Cu)	2. EV batteries	Y. Essential for renewable energy systems
C.	Platinum Group Elements (PGE)	3. Electric wires	Z. Crucial for green hydrogen production

Select the correct answer using the code given below:

- (a) A-3-X, B-1-Y, C-2-Z
- (b) A-2-X, B-3-Y, C-1-Z
- (c) A-1-Z, B-2-Y, C-3-X
- (d) A-2-Y, B-3-X, C-1-Z

Solution: B

- A. Nickel (Ni)** is a key component in the cathodes of **EV batteries** (2). The development of a domestic supply of nickel is crucial for India's clean energy transition and its goal of achieving **net-zero carbon emissions** (X).
- B. Copper (Cu)** is an excellent conductor of electricity and is widely used in **electric wires** (3). Its high conductivity and efficiency make it **essential for renewable energy systems**, such as solar panels and wind turbines, as well as the broader electrical grid (Y).
- C. Platinum Group Elements (PGEs)**, such as platinum and palladium, are used as catalysts in **catalytic converters** to reduce harmful emissions from vehicles (1). They also play a vital role as catalysts in the production of **green hydrogen** through electrolysis and in fuel cells (Z).

6. International Relations and Organisations

- 1) Which one of the following best describes the historical context and purpose of the International Emergency Economic Powers Act (IEEPA), 1977?
- It was enacted to grant the US President indefinite power to nationalize foreign-owned industries during peacetime.
 - It was created to provide a legal framework for the US to join international military alliances without Congressional approval.
 - It was designed to replace the United Nations sanctions framework with a unilateral US trade policy.
 - It was established to limit the broad emergency powers of the President by requiring a formal declaration of a national emergency under the National Emergencies Act.

Solution: D

- The **IEEPA 1977** was a reformist piece of legislation. Before its enactment, US Presidents used the **Trading with the Enemy Act (TWEA) of 1917** to exercise extremely broad powers over the economy, even during times that were not formally "wars." Congress enacted the IEEPA to **restore a balance of power**. It mandates that the President can only use these economic powers after **formally declaring a national emergency** under the **National Emergencies Act**, and it requires periodic reporting to Congress. This ensures that executive action is transparent and subject to oversight.
- The Act is primarily used today for **sanctions diplomacy**. It allows the US to block the assets of terrorists, drug traffickers, or hostile foreign governments that pose an **extraordinary external threat** to the national security, foreign policy, or economy of the United States. Unlike the TWEA, which granted almost "blanket" authority, the IEEPA's powers are intended to be specific to the threat at hand.
- However, its application is frequently debated in courts, as seen with the recent **US Supreme Court ruling** regarding tariffs. The court clarified that while the President has broad discretion to manage emergencies, this does not extend to bypassing Congress's constitutional authority over trade and tariffs for non-emergency, long-term economic goals.

- 2) The "Knesset," often mentioned in the news regarding West Asia diplomacy, is best described as:
- A strategic military alliance between Israel and its Mediterranean neighbors.
 - The supreme court of Israel with the power of judicial review over parliamentary acts.
 - A unicameral legislature that represents the sovereign authority of the state.
 - A religious council responsible for the administration of holy sites in Jerusalem.

Solution: C

- The **Knesset** is Israel's **unicameral national legislature**. As the supreme law-making body, it performs legislative, supervisory, and constitutional functions. It is unique in its electoral system—**proportional representation** based on party lists—which necessitates coalition governments. The recent conferral of a medal by its Speaker on the Indian Prime Minister highlights the importance of **parliamentary-level recognition**, which exists independently of purely executive or governmental diplomacy.
- 3) Consider the following statements regarding the International Climate Initiative (IKI):
- It is a multilateral financial mechanism established under the aegis of the United Nations Framework Convention on Climate Change (UNFCCC).
 - The initiative exclusively funds projects in the designated "Priority Countries," which include India, Brazil, and South Africa.
 - A core focus of the IKI is Ecosystem-based Adaptation (EbA), which utilizes natural processes to improve community resilience against climate risks.

How many of the above statements are correct?

- Only one
- Only two
- All three

(d) None

Solution: A

- The **International Climate Initiative (IKI)** is a critical instrument of the **German government**, not the UNFCCC, although it supports goals like the Paris Agreement's NDCs.
 - Statement 1 is therefore incorrect as it is a bilateral/plurilateral initiative by Germany.
 - Statement 2 is incorrect because while there are **14 Priority Countries** (including India, China, and Mexico) that receive significant focus, the IKI funds projects in over **150 countries** globally. The funding is not "exclusive" to priority nations but seeks a broad impact across developing and emerging economies.
 - Statement 3 is correct. **Ecosystem-based Adaptation (EbA)** is a signature feature of IKI. It emphasizes "nature-based solutions," such as forest restoration or wetland protection, to mitigate disasters like floods and heatwaves. The recently launched **€20 million project in India** specifically targets high-risk ecosystems like the **Western Ghats and the Himalayas**, focusing on groundwater recharge and biodiversity corridors. This highlights IKI's **consortium-based funding model**, which brings together NGOs, research institutes (like GIZ), and the private sector to ensure multidisciplinary expertise in climate resilience and biodiversity conservation.
- 4) Which of the following describes the IMPACT framework mentioned in the context of India–Malaysia relations?
- (a) A military cooperation pact for maritime security in the South China Sea.
 - (b) A bilateral agreement on the repatriation of historical artifacts.
 - (c) A framework for the joint production of high-end semiconductor chips.
 - (d) A strategic vision for economic growth, digital integration, and diaspora ties.

Solution: D

- The **IMPACT framework** stands for **India–Malaysia Partnership for Advancing Collective Transformation**. It was articulated by the Prime Minister of India to define a strategic vision that moves bilateral ties beyond transactional engagement.
 - The framework focuses on **economic and technology cooperation, digital connectivity** (such as the launch of UPI in Malaysia), **diaspora linkages** (leveraging the second-largest Indian-origin community globally), and **cultural bonds**.
 - It aims to position the India–Malaysia relationship as a driver for Asia's collective growth. While maritime security and strategic regional outlooks are part of the broader partnership, the acronym "IMPACT" specifically encapsulates the **digital, economic, and people-centric** pillars of the bilateral transformation. It emphasizes "soft power" elements like the expansion of OCI eligibility to the 6th generation and historical civilizational links.
- 5) Which of the following best describes the primary objective of the Convention on Cluster Munitions (CCM)?
- (a) To allow the use of cluster munitions only in defensive military operations
 - (b) To impose financial penalties on countries that manufacture cluster bombs
 - (c) To prohibit the use, production, transfer, and stockpiling of cluster munitions due to their humanitarian impact
 - (d) To regulate the production and distribution of cluster munitions

Solution: C

The Convention on Cluster Munitions (CCM), adopted in 2008, completely bans the use, production, transfer, and stockpiling of cluster munitions due to their long-term humanitarian risks, particularly the danger of unexploded submunitions harming civilians post-conflict.

What is the Convention on Cluster Munitions (CCM)?

- The CCM is an international treaty that prohibits the **use, transfer, production, and stockpiling** of cluster munitions due to their long-term humanitarian risks.

- **Adopted in 2008**, the treaty entered into force on 1 August 2010.
- It aims to eliminate cluster bombs, which pose a grave threat to civilians even after conflicts end.

Members & Non-Members:

- **112 states are parties to the convention**, with 12 additional signatories yet to ratify it.
- **India**, the U.S., Russia, China, Ukraine, and Israel have not signed the treaty, citing military and strategic concerns.

Key Features of the CCM

- **Comprehensive Ban:** Prohibits the use, development, stockpiling, transfer, and production of cluster munitions.
- **Assistance to Affected Areas:** Requires members to clear contaminated areas and provide aid to victims.
- **Destruction of Stockpiles:** Signatories must destroy existing cluster munition stockpiles within eight years of joining.
- **Prevention of Assistance:** Member states cannot assist, encourage, or induce any nation to engage in banned activities.
- **International Cooperation:** Promotes collaboration in demining, victim support, and destruction of stockpiles.

What are Cluster Munitions?

- **Cluster munitions are explosive weapons that release multiple smaller bomblets (submunitions) over a wide area.**
- They are used to **target dispersed military assets like tanks, infantry, and artillery formations.**
- **Features of Cluster Munitions:**
- **High Submunition Count:** A single cluster bomb can contain several to 600+ bomblets.
- **Delivery Mechanisms:** Launched via aircraft, artillery, or missiles, they scatter bomblets mid-air before impact.
- **Lack of Precision:** Most bomblets are free-falling and unguided, leading to widespread unintended destruction.
- **Unexploded Ordnance (UXO) Risk:** Many bomblets fail to detonate on impact, remaining dangerous for decades, similar to landmines.

6) Consider the following statements about Amnesty International:

1. Amnesty International is an international organization composed of volunteers who campaign for human rights.
2. The organization is known for publishing reports on human rights abuses worldwide.
3. Amnesty International is a governmental organization operating under the United Nations.

How many of the above statements are correct?

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

Solution: B

Statement 3 is incorrect.

Statement 1 is correct as Amnesty International is indeed an international organization composed of volunteers who campaign for human rights.

Statement 2 is correct because Amnesty International is well-known for publishing detailed reports on human rights abuses around the world.

Statement 3 is incorrect because **Amnesty International is a non-governmental organization (NGO)** and operates independently, not under the United Nations.

7) Consider the following statements about the United Nations (UN) and its structure:

1. The UN was established after World War I, with collective security and peacekeeping as some of its founding principles.
2. The General Assembly is the primary policymaking body of the UN, while the UNSC is responsible for peace and security.

Which of the above statements is/are incorrect?

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

Solution: A

- Statement 1: The **United Nations was established in 1945 after World War II**, with the primary goals of maintaining international peace and security, promoting disarmament, and engaging in peacekeeping activities.
- Statement 2 is correct. The General Assembly serves as the UN's main policymaking body, while the UNSC is specifically responsible for issues related to international peace and security.

8) Consider the following statements:

Statement-I: The Royal Indian Navy (RIN) Revolt of 1946 is often regarded as the "Last War of Independence" that accelerated the British withdrawal from India.

Statement-II: The revolt remained confined to the naval ratings of Bombay and Karachi, failing to garner support from the civilian population or other wings of the armed forces.

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

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

Solution: C

- The **Royal Indian Navy (RIN) Revolt**, which began on February 18, 1946, was a watershed moment in the Indian freedom struggle. **Statement-I is correct** as the uprising signaled to the British that the armed forces—the ultimate instrument of colonial control—could no longer be relied upon. This realization significantly accelerated the British decision to transfer power.
- **Statement-II is incorrect** because the revolt was far from isolated. While it began at **HMIS Talwar** in Bombay, it rapidly spread to **78 ships and 20 shore establishments** across Karachi, Madras, Vishakhapatnam, and Kolkata. More importantly, it triggered a massive wave of **popular support**. In Bombay, workers, students, and common citizens joined the ratings in street battles against British troops, leading to the death of nearly 200 civilians.
- The revolt also demonstrated remarkable **communal harmony**, with the flags of the Congress, Muslim League, and Communist Party being hoisted together on naval masts. The involvement of the civilian population in the "Bombay Uprising" turned a military mutiny into a broader anti-colonial rebellion, shattering the myth of British invincibility and imperial stability in the post-World War II era.

9) Consider the following statements regarding the Beat the Heat programme:

Statement I: It is a global initiative focused on accelerating urban resilience against extreme heat through sustainable cooling strategies.

Statement II: The programme is supported by the United Nations Environment Programme (UNEP) through the Cool Coalition.

Statement III: It primarily aims to provide financial subsidies for the mass adoption of traditional high-energy air conditioning units in developing nations.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Solution: C

- The **Beat the Heat** programme is a critical climate adaptation initiative.
- **Statement I is correct** as it translates the **Global Cooling Pledge** into city-level action, focusing on urban cooling and resilience.
- **Statement II is also correct**; it is supported by the **UNEP** via the **Cool Coalition** and was announced under the **COP30 Presidency**.
- **Statement III is incorrect** because the programme's objective is the opposite of promoting traditional, energy-intensive cooling. Instead, it advocates for **efficient cooling technologies**, nature-based solutions (like tree cover expansion), and **passive cooling** (like cool roofs and reflective surfaces). The goal is to protect vulnerable populations while simultaneously **cutting greenhouse gas emissions** from the cooling sector.
- Statement II explains Statement I because the UNEP's involvement provides the institutional framework and expertise needed to implement these urban resilience strategies globally. The distinction between the **UNEP's infrastructure-focused** initiative and the **WHO's health-focused** initiative (for sports events) is an important nuance for aspirants to note.

10) What is the significance of the 'fuel flow controller' in Solid Fuel Ducted Ramjet (SFDR) technology?

- (a) It ignites the ground booster to reach the initial Mach number.
- (b) It acts as a safety valve to jettison the missile in case of a malfunction.
- (c) It filters atmospheric oxygen to prevent damage to the engine duct.
- (d) It regulates the burning of solid fuel to maintain stable combustion at supersonic speeds.

Solution: D

- The **fuel flow controller** is the "brain" of the SFDR's propulsion phase. In a conventional rocket, fuel usually burns at a fixed, predetermined rate. However, in a **Ramjet**, the amount of air being ingested changes with the missile's speed and altitude. To ensure that the **combustion remains stable and efficient** at varying supersonic speeds, the rate at which the solid fuel is consumed must be precisely controlled.
- This controller regulates the flow of the **gas generator's exhaust** (derived from the solid fuel) into the combustion chamber where it mixes with the high-pressure air. By doing so, it allows the missile to provide **sustained thrust** throughout its flight path. Achieving **indigenous combustion control** is considered a major technological breakthrough because maintaining a stable flame in a high-speed airflow (comparable to keeping a candle lit in a hurricane) is extremely difficult.
- This capability is what enables the missile to be "throttlable," allowing it to save fuel during the cruise phase and surge power during the **terminal attack phase**. This significantly improves the **Beyond Visual Range (BVR)** combat advantage for fighter pilots. Without this precise regulation, the ramjet would either flame out or suffer from inefficient combustion, rendering the long-range capability of the missile ineffective.

11) Consider the following statements regarding the AI-for-Energy mission:

1. It is a joint initiative of the International Solar Alliance (ISA) and the International Energy Agency (IEA).
2. The mission uses GIS-based geospatial mapping to optimize energy infrastructure planning in rural and urban areas.
3. A key objective is to transform traditional power grids into smart, bidirectional systems capable of absorbing renewable energy.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect** because while the **International Solar Alliance (ISA)** is the primary body, the mission is launched in partnership with **India's Ministry of Power, MeitY, and REC Limited**, not the IEA. It specifically leverages the "India Energy Stack" as a model.
- **Statement 2 is correct**; the mission utilizes **Geospatial Mapping (GIS)** to provide asset-level visibility. This allows for data-driven planning, showing exactly where infrastructure is needed and how renewable sources can be best integrated into the existing landscape.
- **Statement 3 is correct**; traditional grids are "one-way" (power flows from the plant to the consumer). To handle high levels of solar and wind, grids must become **bidirectional**, allowing "prosumers" (consumers who also produce energy) to feed electricity back into the grid. AI is essential for managing this complexity and ensuring grid stability during peak demand.
- The mission aims to help member countries—many of which are developing nations—to "leapfrog" over the hurdles of legacy infrastructure by using digital twins and decentralized power systems, making clean energy financially and technically viable.

12) Consider the following statements regarding the International Atomic Energy Agency (IAEA):

1. The IAEA is a United Nations based organisation responsible for promoting the peaceful use of nuclear energy.
2. The Additional Protocol of the IAEA allows for more stringent inspections of nuclear facilities to ensure peaceful use.
3. India is not a member of the IAEA as it is not a signatory to the Non-Proliferation Treaty (NPT).

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

Solution: A

- The IAEA is a UN-based international organization dedicated to promoting the peaceful use of nuclear energy (**statement 1 is correct**).
- It was established in 1957 as an autonomous organization within the United Nations system; though governed by its own founding treaty, the organization reports to both the General Assembly and the Security Council of the United Nations, and is headquartered at the UN Office at Vienna, Austria.
- The Additional Protocol allows the IAEA to conduct more intrusive inspections to ensure that nuclear materials are used for peaceful purposes (**statement 2 is correct**).
- However, despite India not being a signatory to the NPT, it is a member of the IAEA and works with the organization under its safeguards agreements (**statement 3 is incorrect**).

13) With reference to the Shanghai Cooperation Organization (SCO), consider the following statements:

1. All Central Asian republics are permanent members of the SCO.
2. The official languages of the SCO are Russian and Chinese.
3. The SCO Development Bank has been established to fund infrastructure projects in member states.

How many of the above statements are incorrect?

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

Solution: B

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- **Only statement 2 is correct.** The **official working languages** of the Shanghai Cooperation Organization (SCO) are **Russian and Chinese**. All official documents and proceedings of the organization are conducted in these two languages.
- **Statement 1 is incorrect.** Not all Central Asian republics are permanent members of the SCO. While **Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan** are permanent members, **Turkmenistan** is not a member of the SCO. Turkmenistan has a foreign policy of permanent neutrality, which has been recognized by the United Nations, and it generally refrains from joining political or military blocs.
- **Statement 3 is incorrect.** The establishment of an **SCO Development Bank** is a **proposal** that has been under discussion for several years, primarily to facilitate financial cooperation and fund joint projects. However, as of now, the bank has **not been established**. There are differences among member states on the modalities and structure of such a bank.

14) Consider the following statements regarding the 'Blue Line':

1. It is a legally binding international border recognized by both Lebanon and Israel.
2. The line is monitored and supervised by the United Nations Interim Force in Lebanon (UNIFIL).

Which of the above statements are correct?

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

Solution: B

- **Statement 1 is incorrect.** The Blue Line is **not an international border**. It is a **temporary demarcation** or a "line of withdrawal." While both Israel and Lebanon agreed to respect this line following the Israeli withdrawal in 2000, they both maintain that it does not prejudice any future negotiations regarding the final, official international boundary.
- The Blue Line was identified by the **United Nations** in 2000. Its primary technical purpose was to confirm that the Israeli Defense Forces (IDF) had fully pulled back from southern Lebanese territory in compliance with **UN Security Council Resolution 425 (1978)**. It runs for approximately **120 km** from the Mediterranean coast to the tri-junction area near the Shebaa Farms.
- **Statement 2 is correct.** The **United Nations Interim Force in Lebanon (UNIFIL)** is the primary body responsible for monitoring the Blue Line. UNIFIL works in coordination with the **Lebanese Armed Forces (LAF)** to maintain stability, prevent escalations, and report violations. These violations can include unauthorized border crossings, aerial overflights, or firing across the line. The Blue Line passes through several **sensitive and disputed zones**, such as the Ghajar village and the Kfarchouba hills. Maintaining the sanctity of this line is critical for **regional stability** and the protection of civilians living on both sides of the frontier, especially during periods of heightened tension between Israel and Hezbollah.

15) With reference to the Panchsheel Agreement, consider the following statements:

1. It was signed between India and China in the context of trade and intercourse with Tibet.
2. The principles of Panchsheel were later incorporated into the Bandung Declaration of 1955.
3. The agreement was signed by Jawaharlal Nehru and Mao Zedong.

How many of the above statements is/are incorrect?

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

Solution: A

The Panchsheel Agreement, or the Five Principles of Peaceful Coexistence, was a landmark agreement that aimed to govern the relations between India and China.

- **Statement 1 is correct.** The Panchsheel Agreement was formally articulated in the "Agreement on Trade and Intercourse between the Tibet Region of China and India," signed on April 29, 1954.

This agreement recognized Tibet as a region of China and was intended to regulate the trade and pilgrimage between the two countries.

- **Statement 2 is correct.** The principles of Panchsheel were incorporated into the final declaration of the Asian-African Conference held in Bandung, Indonesia, in 1955. These principles resonated with the newly independent nations of Asia and Africa, who were seeking to forge a path of non-alignment and peaceful development during the Cold War.
- **Statement 3 is incorrect.** The Panchsheel Agreement was signed by Jawaharlal Nehru, the then Prime Minister of India, and Zhou Enlai, the then Premier of the People's Republic of China. Mao Zedong was the Chairman of the Communist Party of China at the time but was not a signatory to this agreement.

16) With reference to BRICS and its membership, consider the following statements:

1. BRICS was founded in 2009 as a coalition of emerging economies to enhance their global economic and political influence.
2. The headquarters of BRICS is located in Shanghai, China.
3. New members can join BRICS only if all current members agree to their inclusion during the annual BRICS summit.

How many of the statements given above are correct?

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

Solution: B

- BRICS was founded in 2009 by Brazil, Russia, India, and China (South Africa joined in 2010) to strengthen economic ties and increase their influence on global affairs. **So, statement 2 is correct.**
- **Statement 2 is incorrect.** BRICS does not have a permanent headquarters. Instead, its activities are coordinated through annual summits hosted by member nations. The New Development Bank (often associated with BRICS) is headquartered in Shanghai, China. **So, statement 2 is incorrect.**
- For a new member to join BRICS, all current members must agree to their inclusion, typically proposed during the annual BRICS summit. **So, statement 3 is correct.**

Therefore, only two statements are correct.

17) With reference to the Outer Space Treaty (OST) of 1967, consider the following statements:

1. The treaty designates outer space, including the Moon and other celestial bodies, as a global common, preventing any nation from claiming sovereignty over them.
2. It restricts the placement of nuclear weapons in orbit around the Earth but permits the establishment of military bases on celestial bodies for non-aggressive purposes.
3. A signatory state is internationally responsible for national activities in outer space, whether carried out by governmental agencies or by non-governmental entities.
4. The treaty makes a launching state liable for damage caused by its space object on Earth, in air space, or in outer space.

Which of the above statements are correct?

- (a) 1 and 2 only
- (b) 1, 3, and 4 only
- (c) 1, 2 and 3 only
- (d) 1, 2, 3 and 4

Solution: B

- **Statement 1 is correct.** Article II of the OST explicitly states that outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means. This embodies the "**common heritage of mankind**" principle.
- **Statement 2 is incorrect.** Article IV of the OST contains a comprehensive prohibition. It not only forbids placing nuclear weapons or any other kinds of weapons of mass destruction in orbit but also explicitly states

that the Moon and other celestial bodies shall be used **exclusively for peaceful purposes**. The establishment of military bases, installations, and fortifications is expressly forbidden.

- **Statement 3 is correct.** Article VI establishes the principle of **state responsibility**. It makes states internationally responsible for all national space activities, irrespective of whether they are conducted by government agencies or private companies. This ensures accountability for all actors under a state's jurisdiction.
- **Statement 4 is correct.** Article VII outlines the **liability clause**. A State Party that launches or procures the launching of an object into outer space is internationally liable for damage caused by such object or its component parts. This liability extends to damage caused on the Earth, in air space, or in outer space.

18) Consider the following statements about the Shanghai Cooperation Organization (SCO) Secretariat:

1. It is located in Tashkent, Uzbekistan.
2. It is the main executive body of the organization.
3. It is responsible for implementing organizational decisions.

How many of the above statements are correct?

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

Solution: B

- The SCO has two permanent bodies. **Statement 1 is incorrect** because the **SCO Secretariat is located in Beijing, China**. The body located in **Tashkent** is the **Regional Anti-Terrorist Structure (RATS)**.
- **Statement 2 and 3 are correct.** The Secretariat serves as the **primary executive organ**. It provides administrative and organizational support, coordinates the activities of the SCO, and is responsible for the **implementation of decisions** made by the Council of Heads of State (the supreme decision-making body) and the Council of Heads of Government.
- It also handles the organization's information and analysis work. Understanding the distinction between the roles of the Beijing-based Secretariat and the Tashkent-based RATS is a common area of focus in competitive exams regarding international organizations.

19) Consider the following statements regarding the BRICS Centre for Industrial Competencies (BCIC):

1. It was established as a multilateral platform at the headquarters of the United Nations Industrial Development Organization (UNIDO).
2. The Quality Council of India (QCI) has been designated as the nodal centre for India's engagement with BCIC.
3. The centre operates under the framework of the BRICS Partnership on New Industrial Revolution (PartNIR).

How many of the above statements are correct?

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

Solution: B

- The **BRICS Centre for Industrial Competencies (BCIC)** is a public–private platform aimed at supporting manufacturing firms and **MSMEs** in adopting advanced technologies (Industry 4.0). It was established in **2024–25** and launched at the **UNIDO headquarters** (Statement 1 is correct). This highlights the collaboration between BRICS nations and international industrial bodies. However, for India's engagement, the **National Productivity Council (NPC)**, not the Quality Council of India, has been designated as the nodal centre (Statement 2 is incorrect).

- The BCIC is a key pillar of the **BRICS Partnership on New Industrial Revolution (PartNIR)**, which focuses on digitalization, innovation, and industrial modernization across BRICS and BRICS Plus countries (Statement 3 is correct).
- The centre provides market intelligence, advisory services, and capacity building to help MSMEs integrate into global value chains. Its primary goal is to enhance industrial competitiveness and productivity while promoting sustainable manufacturing practices.
- By joining BCIC, India aligns its **Make in India** and **Atmanirbhar Bharat** objectives with the broader technological shifts occurring within the BRICS economic bloc.

20) Consider the following statements regarding the "Shanghai Spirit":

1. It is the core philosophy of the Shanghai Cooperation Organization (SCO).
2. It emphasizes mutual trust, mutual benefit, equality, and respect for the diversity of civilizations.
3. It promotes the pursuit of common development.

How many of the above statements are correct?

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

Solution: C

- The "**Shanghai Spirit**" is the foundational ideological framework that distinguishes the SCO from other regional blocs. **All three statements are correct.** It is defined by the values of **mutual trust**, which aims to reduce military tensions; **mutual benefit**, focusing on economic integration; and **equality**, ensuring that large and small nations have an equal voice in decision-making (consensus-based).
- Furthermore, it explicitly calls for **respect for the diversity of civilizations**, acknowledging that the member states have vastly different political systems, religions, and cultural histories. The **pursuit of common development** focuses on non-interference and collective prosperity. This philosophy is intended to provide a model for international relations that moves away from Cold War-era "bloc thinking" and toward a multi-polar, cooperative security framework.

21) Which of the following countries are members of the Shanghai Cooperation Organization (SCO)?

1. Turkmenistan
2. Islamic Republic of Iran
3. Republic of Belarus
4. Republic of Tajikistan
5. Armenia

Select the correct answer using the code given below:

- (a) 1, 2 and 4 only
- (b) 2, 3 and 4 only
- (c) 2, 4 and 5 only
- (d) 1, 3 and 5 only

Solution: B

- The SCO currently has **10 member states**. These include the five founding members (the "Shanghai Five" minus the name change): **China, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan**, plus **Uzbekistan** (joined in 2001). India and Pakistan joined simultaneously in **2017**. More recently, the organization expanded to include the **Islamic Republic of Iran (2023)** and the **Republic of Belarus (2024)**.
- It is important to note that **Turkmenistan** is not a member; it maintains a policy of "permanent neutrality" and typically participates as a guest or observer in some international forums but not as a formal member of the SCO.
- **Armenia** is a dialogue partner but not a full member. The SCO's official languages are **Russian and Chinese**. The expansion of the SCO to include Iran and Belarus signifies a shift toward a more multi-polar regional

security and economic architecture in Eurasia, aiming to foster "Mutual trust and mutual benefit" among its diverse member base.

22) Consider the following statements regarding the World Trade Organization (WTO):

1. The WTO was established as a replacement for the General Agreement on Tariffs and Trade (GATT) following the Bretton Woods Conference.
2. The decisions within the WTO are typically made by a majority vote of the member countries.
3. The WTO's dispute settlement mechanism has the authority to impose binding sanctions on a member country found to be in violation of its trade obligations.

How many of the above statements are incorrect?

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

Solution: B

- **Statement 1 is incorrect.** The WTO was established following the **Uruguay Round** of trade negotiations (1986–94), not the Bretton Woods Conference (1944). The Bretton Woods Conference led to the creation of the International Monetary Fund (IMF) and the World Bank. While the idea of an International Trade Organization (ITO) was discussed at the time, it did not materialize, and GATT was created as an interim agreement in 1947. The WTO eventually replaced GATT in 1995.
- **Statement 2 is incorrect.** The WTO operates on the principle of **consensus**, not majority voting. This means that decisions are made when no member country formally objects. This approach ensures that the decisions have the support of the entire membership. While the WTO agreements do contain provisions for voting in exceptional circumstances, it is rarely used.
- **Statement 3 is correct.** The **Dispute Settlement Body (DSB)** is a core function of the WTO and is often referred to as the 'jewel in the crown' of the organization. When a member country brings a complaint against another member, a panel is established to adjudicate the dispute. If the panel's ruling, which can be appealed to the Appellate Body, finds a country to be in violation of its WTO obligations, it can recommend that the country bring its measures into conformity. If the country fails to do so, the DSB can authorize the complaining country to impose retaliatory trade sanctions. These rulings are binding.

7. Polity

1) Consider the following statements regarding the removal of the Speaker of the Lok Sabha:

1. A resolution for removal can be moved only after giving at least 14 days' notice to the Secretary-General.
2. The resolution must be passed by a simple majority of the members present and voting in the House.
3. While the resolution is under consideration, the Speaker can preside over the House but cannot vote in the first instance.
4. The procedure for removal is explicitly detailed in Article 94 of the Constitution and further governed by the Rules of Procedure of Lok Sabha.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: B

- The removal of the Speaker is a serious constitutional process reflecting the accountability of the presiding officer.
 - **Statement 1 is correct**; a written notice of at least **14 days** is mandatory under Article 94. This notice is submitted to the **Secretary-General**.
 - **Statement 4 is also correct** as the constitutional basis is **Article 94(c)**, while the granular procedural steps are laid out in **Rules 200–203 of the Lok Sabha Rules**.
 - **Statement 2 is incorrect** because the Speaker is removed by an **effective majority**, which the Constitution defines as a majority of "**all the then members of the House**". This is more stringent than a simple majority of those present and voting.
 - **Statement 3 is incorrect** because when a removal resolution is being considered, the Speaker **cannot preside** over the sitting. However, the Speaker has the right to speak and participate in the proceedings. Crucially, they can **vote in the first instance** on such a resolution but **cannot exercise a casting vote** in the event of a tie. This ensures they can defend their position as a member but lack the tie-breaking authority of the Chair during their own impeachment process. Notably, the Speaker remains in office until the first meeting of a new House after dissolution.
- 2) The term "prohibited places" under the Official Secrets Act, 1923, primarily refers to which of the following?
- (a) Areas where the entry of foreign tourists is restricted for cultural preservation.
 - (b) Notified sensitive installations, including defense establishments and military infrastructure.
 - (c) Biodiversity hotspots that are closed to the public for ecological restoration.
 - (d) Archaeological sites where excavation is currently being conducted by the ASI.

Solution: B

- In the context of the Official Secrets Act, the term "**prohibited places**" is a legal designation with severe implications.
 - **Option (b) is the correct answer**. It includes any site notified by the government as sensitive, such as military bases, defense production units, communication hubs, and strategic infrastructure. Under **Section 3** of the OSA, approaching, inspecting, or even making a sketch of such a place with the intent to help an enemy is a major criminal offense (espionage).
 - The Act was designed to prevent the leakage of information regarding the physical location and layout of India's **strategic assets**. The definition is broad enough to include any place that the government deems necessary to protect in the interest of the state. This legal provision ensures that the **sovereignty and integrity** of India are not compromised by the unauthorized collection of data from sensitive zones. Unlike protected forests or monuments, the restriction here is based purely on **national security** and state secrets.
- 3) With reference to the Official Secrets Act (OSA), 1923, consider the following statements:
1. The Act applies primarily to government servants and does not extend its jurisdiction to private individuals or Indian citizens residing abroad.
 2. A person can be prosecuted under the Act for communicating with foreign agents, and such association can be treated as evidence of an offense against State security.
 3. Courts can take cognizance of an offense under the OSA based on a private complaint filed by any citizen of India.
 4. The Act allows the exclusion of the public from court proceedings if the disclosure of evidence is deemed prejudicial to the security of the State.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: B

- The Official Secrets Act (OSA), 1923, is a colonial-era legislation that remains a cornerstone of India's national security legal framework.
 - **Statement 1 is incorrect** because the OSA has a very broad scope; it applies to **all persons**, including government servants, private citizens, and companies. Crucially, it has **extra-territorial jurisdiction**, meaning it applies to Indian citizens even when they are outside the country.
 - **Statement 2 is correct** under Section 4 of the Act, which stipulates that contact with foreign agents can be used as evidence in a prosecution related to espionage or threats to state integrity.
 - **Statement 3 is incorrect** because Section 13 of the Act places a restriction on trials. A court can only take cognizance of an offense if the complaint is authorized by the **appropriate Government** or an officer empowered by it. This ensures executive oversight before a trial begins.
 - **Statement 4 is correct** as Section 14 allows for *in-camera* proceedings. If the publication of evidence is likely to harm the security of the State, the court may exclude the public from the proceedings. The Act continues to be relevant for **retired personnel**, as seen in recent guidelines regarding the publication of memoirs by former defense officials.
- 4) With reference to the procedure for altering the name of a State in India under Article 3 of the Constitution, consider the following statements:
1. A Bill for renaming a State can be introduced in either House of Parliament only on the prior recommendation of the President.
 2. The President is constitutionally bound to accept the views of the State Legislature regarding the proposed name change.
 3. Such a Bill is considered a Constitutional Amendment Bill under Article 368 and requires a special majority in both Houses.

How many of the above statements are incorrect?

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

Solution: B

INSIGHTSIAS
SIMPLIFYING IAS EXAM PREPARATION

- **Article 3** of the Indian Constitution empowers the Parliament to form new States and alter the areas, boundaries, or names of existing States. The procedure is unique to India's "**indestructible Union of destructible States**" nature.
 - **Statement 1 is correct** because any Bill for this purpose requires the **prior recommendation of the President**. Before recommending the Bill, the President refers it to the concerned **State Legislature** for expressing its views within a specified period.
 - However, **Statement 2 is incorrect**; the **Parliament (and the President) is not bound** by the views of the State Legislature; it may accept or reject them, even if the views are received on time.
 - **Statement 3 is incorrect** because Article 4 of the Constitution explicitly states that laws made under Article 3 are **not to be deemed as amendments** of the Constitution under **Article 368**. They can be passed by a **simple majority** through the ordinary legislative process. This ensures that the Union maintains territorial flexibility. The recent proposal to rename Kerala as '**Keralam**' highlights this process, reflecting linguistic identity rooted in the **Aikya Kerala movement**.
- 5) Consider the following statements regarding the Central Electricity Authority (CEA):
1. CEA is a statutory body responsible for power sector planning and technical regulations.
 2. CEA has the authority to enforce penalties on power distribution companies violating safety norms.
 3. CEA advises the government on electricity policy and grid management.

How many of the above statements is/are incorrect?

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

Solution: A

Statement 2 is incorrect.

Statement 1 is correct as the CEA is a statutory body responsible for power sector planning and technical regulations in India.

Statement 2 is incorrect **because CEA does not enforce penalties on power distribution companies—such regulatory actions fall under the Central Electricity Regulatory Commission (CERC).**

Statement 3 is correct as CEA advises the government on electricity policy, grid stability, and transmission management.

About Central Electricity Authority (CEA):

The **Central Electricity Authority (CEA)** is a **statutory body** responsible for **power sector planning, development, and regulation** in India. It advises the **government on electricity policy and technical standards.**

- It was **established** under the **Electricity (Supply) Act, 1948** and was later reconstituted under the **Electricity Act, 2003.**

Nodal Ministry—Operates under the **Ministry of Power, Government of India.**

Headquarters— **New Delhi, India.**

Structure & Composition

- **Chairperson:** Heads the authority and oversees **policy implementation and technical regulations.**
- **Members:** Comprises **technical and regulatory experts** from different domains of the **power sector.**
- **Divisions:**
 - **Power Planning & Monitoring Division:** Oversees power sector development.
 - **Grid Operations & Transmission Division:** Manages **grid stability** and interconnectivity.
 - **Distribution & Regulatory Affairs:** Ensures **efficient electricity distribution and policy compliance.**
 - **Safety & Training Division:** Focuses on **workforce training, safety protocols, and best practices.**

6) Which of the following states does NOT have Autonomous District Councils established under the Sixth Schedule of the Indian Constitution?

- Mizoram
- Meghalaya
- Assam
- Nagaland

Solution: D

The Sixth Schedule of the Indian Constitution provides for the establishment of Autonomous District Councils (ADCs) in certain tribal areas of Assam, Meghalaya, Mizoram, and Tripura. **Nagaland, while having special provisions under Article 371A, does not have ADCs established under the Sixth Schedule.**

What is an Autonomous District Council (ADC)?

- ADCs are **self-governing tribal administrative bodies** established under **the Sixth Schedule of the Indian Constitution.**
- They provide **autonomy in governance, land management, and cultural preservation** for **Scheduled Tribes (STs)** in **Assam, Meghalaya, Mizoram, and Tripura.**

Membership of Autonomous Councils

- **Elected Members:** The majority of members are **democratically elected** for a **five-year term.**
- **Nominated Members:** The **Governor nominates** a limited number of members to ensure representation of marginalized groups.

Powers of ADCs

- **Legislative Powers:**

- Can frame laws on **land, forests, water resources, agriculture, public health, sanitation, and social customs**.
- Have judicial powers to **settle disputes among tribal communities**.
- **Executive Powers:**
 - Administer **village councils, traditional chiefs, policing, inheritance laws, and local governance**.
- **Judicial Powers:**
 - Can establish **tribal courts** to handle disputes where both parties belong to **Scheduled Tribes**, provided the sentence is **under five years of imprisonment**.

Functions of ADCs

- **Govern tribal areas** while preserving **traditional customs and practices**.
- **Manage resources** such as **forests, water bodies, and minerals**.
- **Develop local infrastructure**, including **education, healthcare, and rural roads**.
- **Promote local governance** through the formation of **village councils**.

Revenue Sources of ADCs

- Power to **levy taxes, fees, and tolls** on:
 - **Land, buildings, vehicles, boats, and animals**.
 - **Goods entering the district**.
 - **Ferries, roads, and employment-based income**.
 - **General taxation for the maintenance of local infrastructure**.

- 7) Which of the following is NOT a key objective of the Namami Gange Programme?
- (a) Restoring biodiversity, including the conservation of the Gangetic Dolphin
 - (b) Promoting afforestation to improve river ecosystem health
 - (c) Regulating the use of hydroelectric dams along the Ganga River
 - (d) Establishing sewage treatment infrastructure along the Ganga basin

Solution: C

The Namami Gange Programme focuses on sewage treatment, afforestation, and biodiversity conservation, including protecting the Gangetic Dolphin. However, **it does not regulate hydroelectric projects, as these fall under the jurisdiction of India's Ministry of Power and the Ministry of Environment, Forest and Climate Change (MoEFCC)**.

About Namami Gange Programme:

What is Namami Gange?

- A **comprehensive river conservation mission** aimed at **cleaning and rejuvenating River Ganga**.
- Approved as a **Flagship Programme** by the **Government of India in 2014**.

Launched In: June 2014, with a budget outlay of ₹20,000 crore, later expanded to ₹42,500 crore.

Ministry: Ministry of Jal Shakti, under the National Mission for Clean Ganga (NMCG).

Aim of Namami Gange:

- **Pollution abatement and ecological restoration** of the Ganga River.
- **Sustainable waste management** through modern **sewage treatment plants (STPs)**.
- **Biodiversity conservation** and revival of aquatic ecosystems.
- **Public engagement and awareness** to promote community participation.

Key Features:

- **Sewage Treatment Infrastructure:** Over 200 sewage treatment projects have been launched to prevent wastewater from polluting the Ganga.
- **Riverfront Development:** Modernization of ghats and crematoriums along the river to enhance sanitation and tourism.
- **Biodiversity Conservation:** Efforts to restore aquatic life, leading to a rise in Gangetic Dolphin population and improved fish species diversity.
- **Afforestation & Eco-Restoration:** Over 1.34 lakh hectares of trees planted along the Ganga to prevent soil erosion and maintain water flow.
- **Ganga Gram Initiative:** Development of 1,674 villages along the river with better sanitation, waste management, and clean drinking water.

- **International Recognition & Collaboration:** Recognized as a Top 10 World Restoration Flagship Initiative (UN Decade on Ecosystem Restoration, 2022).

- 8) The Public Liability Insurance Act (PLIA), 1991, mandates that:
- a) Industries handling non-hazardous materials are exempt from having insurance.
 - b) The insurance is optional for small-scale industries.
 - c) Only government-run industries are required to obtain liability insurance.
 - d) All industries must have insurance coverage for financial relief in case of industrial accidents involving hazardous substances.

Solution: D

The Public Liability Insurance Act, 1991 came into being in the aftermath of the Bhopal Gas Tragedy.

- **This law requires all enterprises that own or have control over handling of any hazardous substance, to subscribe to a “public liability insurance policy cover” whereby they are insured against the claims from third parties for death or injury or property damage caused by hazardous substances handled in their enterprise.**

- 9) How does Article 22(3) of the Indian Constitution affect the rights of individuals under preventive detention?
- (a) It grants additional rights to those under preventive detention
 - (b) It mandates immediate judicial review of preventive detention cases
 - (c) It exempts preventive detention from the protections of Article 22(1) and 22(2)
 - (d) It limits preventive detention to a maximum of 24 hours

Solution: C

- Article 22(3) of the Indian Constitution creates a significant exception to the fundamental rights typically afforded to arrested or detained individuals.
- **By exempting preventive detention from the protections outlined in Article 22(1) and 22(2), it allows for a more expansive application of preventive detention laws.**
- This exemption means that individuals held under preventive detention may not have the right to be informed of the grounds of their arrest or the right to consult a legal practitioner of their choice.
- Additionally, the requirement to produce the detained person before a magistrate within 24 hours may not apply.

This provision reflects the balance struck by the Constitution between individual rights and perceived needs for national security or public order, albeit at the cost of certain fundamental protections.

- 10) How is the 'creamy layer' determination different for children of government employees compared to those from the private sector?
- (a) Government employees' children are always in the creamy layer
 - (b) Private sector employees' children are never in the creamy layer
 - (c) For government employees, it's based on rank; for private sector, it's based on income
 - (d) There is no difference in determination between the two sectors

Solution: C

The determination of 'creamy layer' status differs between government and private sector employees' children. **For government employees, the criteria are primarily based on the rank or position of the parent in service.** For instance, children of Group A officers or those promoted to Group A before age 40 are considered part of the creamy layer. In contrast, **for private sector employees, the determination is based on the parents' income.** This distinction recognizes the different structures and compensation systems in government and private sectors, aiming to create a fair assessment of socio-economic status across various employment types.

- 11) Article 102 of the Indian Constitution deals with the disqualification of MPs from either house of the Parliament. The reasons under which an MP can be disqualified include:

1. if he has voluntarily acquired the citizenship of a foreign State.
2. if he is an undischarged insolvent.
3. if he holds any office of profit under the Government of India.
4. if he is disqualified by the Election Commission of India.

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 1, 3, and 4 only
- (c) 1, 2 and 3 only
- (d) 1, 2, 3 and 4

Solution: C

Article 102 deals with the disqualification of MPs from either house of the Parliament.

Part (1) of the article lists the reasons why an MP can be disqualified. These include,

- (a) **if he holds any office of profit under the Government of India** or the Government of any State, other than an office declared by Parliament by law not to disqualify its holder;
- (b) if he is of unsound mind and stands so declared by a competent court;
- (c) **if he is an undischarged insolvent;**
- (d) if he is not a citizen of India, or has **voluntarily acquired the citizenship of a foreign State**, or is under any acknowledgment of allegiance or adherence to a foreign State;
- (e) if he is so disqualified by or under any law made by Parliament.

12) Consider the following statements regarding the Removal of the Chief Election Commissioner:

1. The motion for removal must be supported by a minimum of 100 members in Lok Sabha or 50 members in Rajya Sabha to be admitted.
2. The President has the discretionary power to reject the advice of Parliament regarding the removal of the CEC.
3. An independent inquiry committee must establish "proved misbehaviour or incapacity" before the motion is voted upon.

Which of the above statements are correct?

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

Solution: D

- **Statement 1 is correct:** Under the **Judges (Inquiry) Act, 1968** (which governs the procedure as the CEC is removed in "like manner" to an SC Judge), a motion must be signed by at least **100 MPs in Lok Sabha** or **50 in Rajya Sabha**. This prevents frivolous political attacks on the ECI.
- **Statement 2 is incorrect:** The President acts on the **address of Parliament**. If both Houses pass the motion with the requisite special majority, the President **must** issue the removal order. There is no personal discretion involved.
- **Statement 3 is correct:** A three-member **inquiry committee** (comprising a SC judge, a Chief Justice of a High Court, and a distinguished jurist) must investigate the charges. If they find no grounds, the motion cannot proceed. This ensures **due process** and protects the independence of the constitutional body.

13) Consider the following statements regarding the Removal of the Chief Election Commissioner (CEC):

Statement I: The CEC can be removed from office only through a process of impeachment initiated in the Lok Sabha.

Statement II: The grounds for removal of the CEC are the same as those for a Judge of the Supreme Court.

Statement III: A special majority of both Houses of Parliament is required to pass the motion for removal.

How many of the above statements are correct?

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

- (c) All three
- (d) None

Solution: B

- **Statement 1 is incorrect:** While the procedure is *similar* to impeachment, the Constitution uses the phrase "in like manner and on like grounds as a Judge of the Supreme Court." Furthermore, the motion can be introduced in **either House of Parliament**, not just the Lok Sabha.
- **Statement 2 is correct:** Under **Article 324(5)**, the CEC is provided with security of tenure. The grounds for removal are specifically "**proved misbehaviour or incapacity**," which are the identical grounds stipulated for Supreme Court judges under Article 124(4).
- **Statement 3 is correct:** The removal requires a **special majority**—a majority of the total membership of the House AND a majority of not less than two-thirds of the members present and voting in each House.

14) Consider the following statements regarding the National Commission for Scheduled Tribes (NCST):

1. It was originally a part of a combined commission for both Scheduled Castes and Scheduled Tribes.
2. The Commission has the power to participate and advice on the planning process of socio-economic development of the Scheduled Tribes.
3. The Chairperson and members are appointed by the Prime Minister of India.

How many of the above statements are correct?

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

Solution: B

- Statement 1 is correct. The **89th Constitutional Amendment Act, 2003** bifurcated the erstwhile combined National Commission for SCs & STs. This resulted in the creation of a separate NCST under **Article 338A**, which became functional in 2004.
- Statement 2 is correct as it is a core constitutional mandate of the NCST to be involved in the **planning and evaluation** of development programs for STs.
- Statement 3 is incorrect. In accordance with the Constitution, the **President of India**, not the Prime Minister, appoints the Chairperson, Vice-Chairperson, and the three members of the Commission by warrant under his hand and seal. This ensures the commission's **independent constitutional status**.

15) Which one of the following is the correct procedure for the appointment of the Chief Election Commissioner as per the 2023 Act?

- (a) Appointment by the President on the sole advice of the Chief Justice of India.
- (b) Appointment by the President after a mandatory public hearing and parliamentary approval.
- (c) Appointment by a collegium consisting of the Prime Minister, the Chief Justice of India, and the Speaker of the Lok Sabha.
- (d) Appointment by the President based on the recommendation of a committee comprising the PM, Leader of Opposition in Lok Sabha, and a Union Cabinet Minister.

Solution: D

The appointment process for the Chief Election Commissioner (CEC) and other Election Commissioners (ECs) has been formalised by the **Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023**. This Act was brought in to provide a statutory framework for the appointment process, which was previously handled by the executive based on convention.

According to this Act, the **President of India** makes the appointment based on the recommendations of a **three-member selection committee**. This committee consists of:

1. The **Prime Minister**, who serves as the Chairperson.
2. The **Leader of Opposition** in the Lok Sabha (or the leader of the largest opposition party).

3. A **Union Cabinet Minister** nominated by the Prime Minister.

This structure ensures that the selection process involves the top leadership of both the government and the opposition. The tenure of the CEC remains **6 years or until the age of 65**, whichever is earlier. While the selection committee recommends the names, the constitutional protection regarding **removal** (which requires a special majority in Parliament) remains the bedrock of the CEC's independence. This ensures that while the appointment involves a political-executive committee, the officeholder cannot be easily dismissed by the government of the day, thereby upholding the **integrity of the democratic electoral process**.

16) Consider the following statements regarding the Privileges Committee of the Parliament:

Statement I: The committee acts as a quasi-judicial body to protect the dignity and authority of the legislative institution.

Statement II: It has the power to summon both members and outsiders to record statements and demand relevant documents.

Statement III: The concept is rooted in British Parliamentary conventions originally developed to protect the House of Commons from the Monarch.

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

- Both Statement II and Statement III are correct and both of them explain Statement I
- Both Statement II and Statement III are correct but only one of them explains Statement I
- Only one of the Statements II and III is correct and that explains Statement I
- Neither Statement II nor Statement III is correct

Solution: A

- The **Privileges Committee** is a vital standing committee that ensures the independence of the legislature.
- Statement I is correct** as the committee's role is quasi-judicial; it investigates breaches of privilege and recommends action to maintain the House's dignity.
- Statement II is correct** and explains *how* it functions as a quasi-judicial body (by exercising powers similar to a court, such as summoning individuals and collecting evidence).
- Statement III is also correct** and explains the *reason* for the committee's existence and its "quasi-judicial" nature—it was historically necessary to protect lawmakers from external interference (specifically the Monarch in the British context).
- Since both its functional powers (summoning) and its historical origin (protection from interference) are the foundations of its status as a protector of legislative dignity, both explain Statement I. The committee in the **Lok Sabha has 15 members**, while the **Rajya Sabha has 10**, all nominated by the respective Presiding Officers. Articles 105 and 194 of the Constitution define these immunities. The committee's recommendations can range from a simple apology to imprisonment for the duration of the session, though the latter is rare.

17) Consider the following statements about the protection offered by GI registration in India:

- The GI tag helps to protect products against unauthorized use by individuals or entities outside the registered geographic area.
- GI registration helps promote exports by enhancing the marketability of products linked to their origin.
- A GI tag can be transferred or assigned to other producers outside the geographical region.

Which of the above statements are correct?

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1, 2 and 3

Solution: A

- Statement 1 is correct as the **GI tag helps protect products from unauthorized use by individuals or producers outside the specified geographical area**, thus preserving the unique identity and reputation of the product.

- Statement 2 is also correct because the **GI tag enhances the marketability and export potential of products** by linking them to a specific origin known for quality and distinctiveness.
- Statement 3 is incorrect because a GI tag cannot be transferred or assigned to other producers outside the defined geographical region. GIs are tied to the location of production and the qualities associated with that region.

18) With reference to the Chief Election Commissioner (CEC) of India, consider the following statements:

1. The CEC can be removed from office by the Prime Minister on the recommendation of a three-member committee.
2. The grounds for the removal of the CEC are the same as those for the removal of the President of India.
3. The removal process requires a simple majority in both the Lok Sabha and the Rajya Sabha.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) None of the above

Solution: D

- **Statement 1 is incorrect** because the CEC is a constitutional authority and cannot be removed by the Prime Minister. The CEC is appointed by the President, and the removal can only be effected through a **parliamentary process** similar to that of a Supreme Court judge.
- **Statement 2 is incorrect.** According to **Article 324(5)**, the CEC can be removed from office "in like manner and on like grounds as a Judge of the Supreme Court." The grounds for the removal of a Supreme Court judge (and thus the CEC) are "**proved misbehaviour**" or "**incapacity**," as per Article 124(4). This is distinct from the grounds for the removal of the President, which is "violation of the Constitution" (Article 61).
- **Statement 3 is incorrect** because the removal process is much more rigorous than a simple majority. It requires a **constitutional special majority** in each House of Parliament. This means the motion must be supported by a **majority of the total membership** of the House and a majority of **not less than two-thirds of the members present and voting**. Only after such a motion is passed in both Houses is it presented to the President for the formal order of removal. These stringent protections are designed to ensure the **independence and impartiality** of the Election Commission of India, preventing the executive from removing the CEC for political reasons.

19) Consider the following statements:

Statement I: The National Commission for Women (NCW) possesses the powers of a civil court.

Statement II: The NCW can investigate matters, summon witnesses, and require the production of documents while examining complaints.

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

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

Solution: A

- The **National Commission for Women (NCW)** is a statutory body with significant **quasi-judicial powers**.
- **Statement I is correct** because, under the NCW Act, 1990, the Commission is vested with the **powers of a civil court** while performing its functions, particularly during the investigation of complaints.

- **Statement II is also correct** and explains why Statement I is true; the specific attributes of civil court powers include the authority to **summon and enforce the attendance of witnesses**, examine them on oath, and **requisition any public record** or document.
- These powers are essential for its role as a **grievance redressal mechanism**. When the NCW receives a complaint regarding the deprivation of women's rights or the non-implementation of protective laws, it can use these legal tools to conduct a formal inquiry. While it cannot "punish" like a criminal court, its findings and recommendations carry weight and are reported to the government. This **investigative capacity** allows the NCW to act as an effective watchdog, ensuring that constitutional and legal safeguards for women are not just theoretical but are actively enforced.

20) Consider the following statements regarding the composition of the National Commission for Women (NCW):

1. The Commission must consist of at least one member each from the Scheduled Castes and Scheduled Tribes.
2. Members must be drawn from diverse fields such as law, trade unionism, and women's movements.
3. The Chairperson must be a retired judge of the Supreme Court or a High Court.

Which of the statements given above are correct?

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

Solution: A

- According to **Section 3 of the NCW Act, 1990**, the Commission consists of a Chairperson and five members. A critical legal requirement is the **mandatory representation of marginalized communities**, specifically that **at least one member each** must be from the **Scheduled Castes (SC) and Scheduled Tribes (ST)**. The five members are selected from persons of ability and integrity who have had experience in fields like **law, administration, education, health, social welfare, or women's movements**.
- The statement regarding the Chairperson is incorrect. The Act does not mandate that the Chairperson be a retired judge; rather, they should be a person "**committed to the cause of women**" and is nominated by the Central Government. The NCW plays a pivotal role in **grievance redressal** and legislative review, recommending amendments to address gaps in existing laws.

21) Consider the following statements:

Statement-I: A Privilege Notice can be moved by any Member of Parliament (MP) against another member or even an outsider.

Statement-II: Parliamentary privileges are intended to ensure that members can perform their duties without obstruction or intimidation.

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

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

Solution: A

- Parliamentary privileges are fundamental to the functioning of a deliberative democracy.
- **Statement-I is correct**; any MP can submit a written notice to the Presiding Officer (Speaker or Chairman) alleging a breach of privilege or contempt of the House. This notice can be directed at another member for misleading the House or even at an outsider (such as a journalist or official) for acts that lower the dignity of the Parliament.

- **Statement-II is correct**; the very purpose of these privileges—which include freedom of speech (Article 105) and immunity from court proceedings (Article 122)—is to provide a **protected environment** where legislators can speak and vote freely. Without these protections, members might face legal harassment or physical intimidation, which would obstruct their constitutional duties.
- **Statement-II explains Statement-I** because the right to move a Privilege Notice is the procedural mechanism through which these essential protections are enforced. If a member feels that an action (like a misleading statement or obstruction) undermines their ability to function, they use the notice to trigger a parliamentary investigation.
- Thus, the existence of the notice (procedural right) is a direct consequence of the need to uphold the "special rights and immunities" (substantive right) described in Statement-II.

22) With respect to the Voter Verifiable Paper Audit Trail (VVPAT) feature in EVMs, consider the following statements:

1. VVPAT provides a printed slip with the name of the candidate the voter has selected.
2. The printed slip can be retained by the voter for future reference.
3. VVPAT is used as an audit mechanism to verify the electronic vote.
4. VVPAT was introduced to increase transparency and reduce doubts about EVM accuracy.

Which of the above statements are correct?

- (a) 1 and 2 only
- (b) 1, 3, and 4 only
- (c) 1, 2 and 3 only
- (d) 1, 2, 3 and 4

Solution: B

VVPAT provides a printed slip with the candidate's name, visible to the voter for a few seconds before it drops into a sealed compartment. It serves as an audit trail to cross-check the accuracy of the electronic vote, enhancing transparency. **Statement 2 is incorrect** because the voter cannot retain the slip; it is stored for auditing purposes by election officials.

23) Consider the following statements about the Citizenship Act, 1955:

1. The Act does not allow for dual citizenship, maintaining India's policy of single citizenship.
2. Citizenship can be obtained through birth, descent, registration, or naturalization, and there is a special provision for those married to Indian citizens.
3. The Act provides for the revocation of citizenship if a person acquires citizenship of another country.

How many of the above statements are correct?

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

Solution: C

- The **Citizenship Act, 1955**, enshrines the principle of single citizenship, meaning Indian citizens cannot hold dual nationality. This policy is intended to ensure allegiance to India.
- The Act allows citizenship to be acquired through **birth, descent, registration, or naturalization**. There is a provision for registration for those married to Indian citizens, provided they meet certain residency and legal requirements.
- The Act **does provide for the revocation of Indian citizenship** if a person voluntarily acquires the citizenship of another country, maintaining the exclusivity of Indian nationality.

24) Consider the following statements regarding the tenure and functions of the Chief Justice of India (CJI):

1. The Chief Justice of India has the discretion to appoint any High Court judge as an ad hoc judge of the Supreme Court to handle a backlog of cases.

2. The CJI is responsible for the allocation of cases and the composition of benches in the Supreme Court.
3. Upon retirement, a former CJI cannot be appointed to any position under the government of India to avoid conflicts of interest.

Which of the above statements are correct?

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

Solution: A

- **Statement 1 is incorrect.** While the CJI does have administrative authority, the appointment of ad hoc judges is not at the discretion of the CJI alone. It requires consultation and specific procedures outlined under **Article 127 of the Constitution**.
- **Statement 2 is correct.** The CJI plays a crucial role in the functioning of the Supreme Court, including the **allocation of cases and the constitution of benches**, which impacts the court's efficiency and the delivery of justice.
- **Statement 3 is incorrect.** There is no constitutional restriction on appointing a retired CJI to a government position, although such appointments are scrutinized for **potential conflicts of interest**.

25) Match the Union Territory in List-I with the corresponding provision for nominated members in its Legislative Assembly in List-II.

List-I (Union Territory)	List-II (Provision for Nominated Members)
A. Jammu & Kashmir	1. Up to three members nominated by the Central Government.
B. Puducherry	2. No provision for nominated members.
C. Delhi	3. Up to five members may be nominated by the Lieutenant Governor.

Select the correct answer code:

- (a) A-2, B-1, C-3
- (b) A-1, B-3, C-2
- (c) A-3, B-2, C-1
- (d) A-3, B-1, C-2

Solution: D

- **Jammu & Kashmir (A):** According to **Section 14 of the J&K Reorganisation Act, 2019 (as amended in 2023)**, the Lieutenant Governor may nominate up to five members to the assembly. This includes specific representation for two women, two Kashmiri migrants, and one displaced person from Pakistan-occupied Kashmir (PoK). Therefore, A matches with 3.
- **Puducherry (B):** Under **Section 3 of the Government of Union Territories Act, 1963**, the Central Government has the authority to nominate up to three members to the Puducherry Legislative Assembly. This power has been a subject of judicial scrutiny and has been upheld by the courts. Therefore, B matches with 1.
- **Delhi (C):** The **Government of National Capital Territory of Delhi (GNCTD) Act, 1991**, which governs the Delhi Legislative Assembly, has **no provision for nominated members**. The assembly consists solely of 70 elected members. Therefore, C matches with 2.

26) With reference to the National Commission for Women (NCW), consider the following statements:

1. It is a constitutional body established under the 73rd Constitutional Amendment Act.
2. The Commission has the power to inspect jails and remand homes where women are kept in custody.
3. The Chairperson and all members are nominated by the President of India.

How many of the above statements are correct?

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

- (c) All three
- (d) None

Solution: A

Only Statement 2 is correct.

- The **National Commission for Women (NCW)** is not a constitutional body; it is a **statutory body** established on 31 January 1992 under the **National Commission for Women Act, 1990**. Its creation was based on the recommendations of the Committee on the Status of Women in India (CSWI) and the National Perspective Plan for Women. Under **Section 10 of the Act**, the Commission is mandated to **inspect jails, remand homes, or other places of custody** where women are kept, to ensure their rights are protected.
- Regarding its structure, the **Chairperson and five members are nominated by the Central Government**, not the President. The law mandates that at least **one member each must belong to the Scheduled Castes and Scheduled Tribes**. The Commission functions as a watchdog for women's rights, possessing the **powers of a civil court** in matters of summoning witnesses and requisitioning documents. It acts as an advisory body to the government on legislative and policy matters affecting women and can take **suo motu notice** of matters relating to the deprivation of women's rights.

27) In the context of Indian elections, consider the following:

Statement-I: Form 7 of the Registration of Electors Rules, 1960, allows for the objection to the inclusion of a name in the electoral roll.

Statement-II: Under the 2022 amendment, only a person whose name is registered in the same polling booth can file an objection against another voter.

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

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

Solution: C

- **Statement-I is correct.** **Form 7** is the statutory mechanism used to object to the inclusion or seek deletion of a name from the electoral roll. Common grounds include death, duplication, or shifting of residence.
- **Statement-II is incorrect.** Following the **2022 amendment**, the scope of Form 7 was expanded. Now, **any registered elector of the constituency** (not just the same booth) can file an objection against the inclusion of a name in the roll of that constituency. This change was intended to increase transparency but has recently led to controversies regarding **bulk deletions**.
- The process involves strict **physical verification** by the Booth Level Officer (BLO) and a hearing by the Electoral Registration Officer (ERO). Filing a false declaration in Form 7 is a punishable offense under **Section 32 of the RP Act, 1950**, carrying potential imprisonment.

28) Consider the following statements regarding the Ninth Schedule of the Indian Constitution:

1. It was introduced by the First Constitutional Amendment Act, 1951.
2. Laws placed in the Ninth Schedule are completely immune from judicial review.
3. The Supreme Court's judgment in the *I.R. Coelho* case held that all laws in the Ninth Schedule are subject to judicial review.

How many of the above statements are correct?

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

Solution: A

- **Statement 1 is correct.** The Ninth Schedule was added to the Constitution by the First Constitutional Amendment Act of 1951, along with Article 31B, to protect land reform laws from being challenged in courts on the grounds of violation of fundamental rights.
- **Statement 2 is incorrect.** While the original intent of the Ninth Schedule was to provide blanket immunity to the laws placed within it, the Supreme Court has, over time, curtailed this immunity. The landmark judgment in the *I.R. Coelho v. State of Tamil Nadu* (2007) case established that laws placed in the Ninth Schedule after April 24, 1973, are open to judicial review if they violate the basic structure of the Constitution. Therefore, the immunity is not absolute.
- **Statement 3 is incorrect.** The *I.R. Coelho* judgment did not subject all laws in the Ninth Schedule to judicial review. It drew a distinction between laws inserted before and after the date of the *Kesavananda Bharati* judgment (April 24, 1973). Only the laws inserted after this date are subject to the test of the basic structure doctrine.

29) With reference to Denotified Tribes (DNTs) in India, consider the following statements:

1. They were historically branded as "criminal tribes" under the Criminal Tribes Act of 1871 during British rule.
2. The term "Denotified" refers to their status after the repeal of the colonial law in 1952.
3. Following the repeal, they were immediately granted a separate constitutional category similar to SCs and STs.

How many of the above statements are correct?

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

Solution: B

- Denotified Tribes (DNTs), or **Vimukta Jatis**, have a unique and painful history.
- Statement 1 is correct; the British colonial government enacted the **Criminal Tribes Act of 1871**, which declared entire communities as "born criminals," subjecting them to **constant surveillance and restricted movement**.
- Statement 2 is also correct; after Independence, the Government of India repealed this draconian law in **1952**, and these tribes were "denotified" from the list of criminal tribes.
- However, Statement 3 is incorrect. Instead of a separate constitutional category, DNTs were often absorbed into the existing **SC, ST, or OBC lists**. This has led to **political misclassification**, as they often cannot compete for benefits with more advanced groups within those categories.

30) Consider the following statements:

Statement I: The Election Commission of India exercises administrative, quasi-judicial, and advisory powers.

Statement II: The enforcement of the Model Code of Conduct and the delimitation of constituencies are part of the ECI's quasi-judicial functions.

Statement III: Advising the President on the disqualification of members of Parliament is a key advisory function of the ECI.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I.
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I.
- (c) Only one of the Statements II and III is correct and that explains Statement I.
- (d) Neither Statement II nor Statement III is correct.

Solution: C

- **Statement I** provides a correct, overarching summary of the ECI's powers. It operates in administrative, quasi-judicial, and advisory capacities.
- **Statement II is incorrect.** The enforcement of the Model Code of Conduct and the delimitation of constituencies are **administrative functions**, not quasi-judicial. Administrative functions relate to the management and conduct of elections. Quasi-judicial functions, on the other hand, involve settling disputes, such as those between political party factions.
- **Statement III is correct.** Advising the President (in the case of MPs) or the Governor (in the case of MLAs) on matters of disqualification of sitting members is a crucial **advisory function** of the ECI. This advice is binding.
- Therefore, only Statement III is a correct example that explains a component of Statement I.

31) The Supreme Court recently directed the constitution of a tribunal for the Pennaiyar River water dispute. Which provision of the Constitution allows a state to file a suit in the Supreme Court for such inter-state disputes?

- (a) Article 123
- (b) Article 131
- (c) Article 262
- (d) Article 356

Solution: B

- **Article 131 (Option b)** provides the **Original Jurisdiction** of the Supreme Court, allowing it to hear disputes between the Government of India and one or more States, or between two or more States. Tamil Nadu invoked this article to seek the constitution of a tribunal.
- However, one must distinguish this from **Article 262**, which specifically deals with the adjudication of disputes relating to waters of inter-state rivers. Under Article 262, Parliament enacted the **Inter-State River Water Disputes Act, 1956**, which allows for the creation of specific Tribunals.
- While Article 131 is the "door" to the Supreme Court for states, the Court often directs the government to act under the 1956 Act (as seen in the Pennaiyar case).
- Article 123 relates to the President's power to promulgate ordinances, and Article 356 relates to President's Rule.
- The Pennaiyar dispute, centered on the **Markandeya River** (a tributary), illustrates how Article 131 remains a critical tool for states to resolve federal conflicts.

32) Consider the following statements:

Statement I: The Motion of Thanks to the President's Address is considered a "policy debate" rather than a mere ceremonial event.

Statement II: Failure to pass the Motion of Thanks in the Lok Sabha is seen as a lack of confidence in the Council of Ministers.

Statement III: The Prime Minister traditionally replies to the debate on the Motion of Thanks before it is put to vote.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Solution: A

- **Statement I is correct** because the Motion of Thanks is the first major opportunity each year for the House to scrutinize the government's performance and future goals.
- **Statement II is correct;** since the address is a statement of government policy, its rejection by the popularly elected Lok Sabha is equivalent to a **No-Confidence Motion**, necessitating the government's resignation. This accountability mechanism is what transforms the address from a ceremony into a high-stakes policy debate.

- **Statement III is correct;** the Prime Minister's reply serves as the government's final defense and clarification of the points raised during the discussion.
- Both Statements II and III **explain Statement I** because the severe consequence of defeat (Statement II) and the high-level response by the head of government (Statement III) are exactly what imbue the Motion with its political and policy significance. Without these elements, the "Thanks" would be a mere formality. Therefore, they collectively justify why the event is categorized as a substantive policy debate.

33) Consider the following statements regarding the 'Motion of Thanks' to the President's Address in the Indian Parliament:

1. The President's Address is a constitutional requirement under Article 87(1) at the beginning of every session of Parliament.
2. The Motion of Thanks provides an opportunity for the Parliament to discuss the government's policies and programs.
3. If the Motion of Thanks is defeated in the Lok Sabha, it amounts to a defeat of the government.
4. Any amendment to the Motion of Thanks passed in the Rajya Sabha requires the immediate resignation of the Prime Minister.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Solution: B

- The Motion of Thanks is a vital instrument of parliamentary accountability.
- **Statement 1 is incorrect** because the Special Address under Article 87(1) is mandated only at the **commencement of the first session after each general election** and the **commencement of the first session of every year** (the Budget Session), not "every session."
- **Statement 2 is correct** as the debate on the Motion of Thanks is wide-ranging, allowing members to critique or support the government's roadmap presented in the address.
- **Statement 3 is correct.** Since the address is prepared by the Council of Ministers, the passage of the Motion of Thanks is seen as a vote of confidence. Its defeat in the Lok Sabha signifies that the government has lost the majority, leading to its collapse.
- **Statement 4 is incorrect.** Amendments have been passed in the **Rajya Sabha** five times (most recently in 2015 and 2016). Since the government is not collectively responsible to the Rajya Sabha, such amendments express the House's dissent but do not necessitate the Prime Minister's resignation. However, in the Lok Sabha, no amendment has ever been carried, as it would imply a loss of confidence.

34) Consider the following statements regarding the Election Commission of India (ECI):

1. The ECI is a statutory body established by an Act of Parliament.
2. The Chief Election Commissioner (CEC) and other Election Commissioners are appointed by the President of India and hold office for a term of five years or up to the age of 65 years, whichever is earlier.
3. The ECI has quasi-judicial powers to resolve disputes related to splits and mergers of recognized political parties.

Which of the above statements are correct?

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

Solution: A

- **Statement 1 is incorrect.** The Election Commission of India is a **constitutional body**, not a statutory body. It is established under **Article 324** of the Constitution of India. This article vests the 'superintendence, direction and control of elections' in the ECI.
- **Statement 2 is also incorrect.** The tenure of the Chief Election Commissioner (CEC) and other Election Commissioners is **six years or up to the age of 65 years**, whichever is earlier, not five years.
- **Statement 3 is correct.** The ECI has **quasi-judicial functions**, which include settling disputes relating to splits and mergers of recognized political parties and allotting symbols to them. This power is crucial for maintaining order and clarity within the political landscape, especially during elections. The Commission's decisions in these matters are binding on the factions involved.

8. History, Art and Culture

1) In the context of the Indian Freedom Struggle, consider the following pairs:

Organization/Event : Leader Associated

1. Hindustan Republican Association : Ram Prasad Bismil
2. Lahore Conspiracy (1928) : Chandrashekhar Azad
3. Non-Cooperation Movement : Chandra Shekhar Sitaram Tiwari

How many of the above pairs are correctly matched?

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

Solution: C

- Pair 1 is correct as Chandrashekhar Azad joined the **Hindustan Republican Association (HRA)** under the leadership of **Ram Prasad Bismil**. After the British crackdown on HRA, Azad reorganized it into the **Hindustan Socialist Republican Association (HSRA)**.
- Pair 2 is correct; Azad, along with Bhagat Singh and Rajguru, executed the assassination of John Saunders in the **Lahore Conspiracy** to avenge Lala Lajpat Rai's death.
- Pair 3 is correct; Azad's original name was **Chandra Shekhar Sitaram Tiwari**. He participated in the **Non-Cooperation Movement** at the age of 15, where he famously earned the title 'Azad' during his trial. Disappointed by the suspension of the movement after the **Chauri Chaura incident**, he shifted toward militant revolutionary methods. He was known for his "Quick Silver" dexterity and vowed never to be captured alive, a promise he kept during the gun battle at **Alfred Park** in 1931.

2) Which of the following describes the "Bombay Uprising" of February 1946?

- a) A peasant rebellion against the Zamindari system in the Bombay Presidency.
- b) A protest by the Bombay textile mill workers against the Rowlatt Act.
- c) A strike by the Indian members of the Royal Indian Air Force (RIAF).
- d) A mass protest by workers and civilians in support of the striking naval ratings.

Solution: D

- The term "**Bombay Uprising**" specifically refers to the massive civilian involvement that followed the RIN strike. On February 21 and 22, 1946, Bombay saw a total shutdown.
- **Statement (b) is correct.** Over **200,000 workers** in textile mills and other factories came out in support of the naval ratings. This was not just a military mutiny; it became a urban insurrection.
- The British responded with heavy force, deploying troops and even tanks in the mill districts of **Kamatipura and Madanpura**. The resulting street battles led to nearly 200 deaths and over 1,000 injuries. This event is significant because it showed that the anti-British sentiment had reached a boiling point where the civilian

population was willing to face live fire to support the "boys in blue" (the naval ratings). It remains one of the most powerful examples of mass resistance in the final years of British rule.

- 3) Match the following movements with their corresponding leaders or key contributions of Sardar Vallabhbhai Patel:

Movements	Contributions by Sardar Patel
A. Kheda Satyagraha	1. Mobilized significant funds for Khadi promotion
B. Bardoli Satyagraha	2. Gained the title "Sardar" for successful leadership
C. Quit India Movement	3. Called for mass protests against British Salt Laws
D. Non-Cooperation Movement	4. Supported farmers during a famine against tax collection

Select the correct answer using the code given below:

- (a) A-2, B-4, C-1, D-3
 (b) A-4, B-2, C-1, D-3
 (c) A-4, B-3, C-2, D-1
 (d) A-4, B-2, C-3, D-1

Solution: D

- In the Kheda Satyagraha (A-4), Patel led the protest against tax collection from farmers suffering from a famine.
 - The Bardoli Satyagraha (B-2) was where Patel earned the title "Sardar" after successfully opposing unfair revenue assessments.
 - During the Quit India Movement (C-3), he called for extensive protests, showing his commitment to independence.
 - In the Non-Cooperation Movement (D-1), he played a crucial role by mobilizing people, funds, and promoting Khadi, underscoring his support for economic self-reliance and resistance to British goods.
- 4) In the context of Indian tribal history and culture, who among the following is popularly revered as "Guru Gomke" (Great Teacher)?
- (a) Birsa Munda
 (b) Sidhu Murmu
 (c) Raghunath Murmu
 (d) Kanhu Murmu

Solution: C

- **Pandit Raghunath Murmu** is the visionary behind the **Oi Chiki script**, created in 1925. The title "**Guru Gomke**", which translates to "The Great Teacher," was bestowed upon him by the Santhali community in recognition of his immense contribution to their linguistic and cultural identity.
 - Unlike other tribal leaders like Birsa Munda, who led political and millenarian movements against British rule, Raghunath Murmu's revolution was **literary and cultural**. By inventing a script that was phonetically suited for the Santhali language, he empowered the community to document their rich oral traditions and folklore.
 - His work, including plays and poetry like *Hidu Serena*, laid the foundation for modern Santhali literature. The centenary of the script in 2025-26 highlights his legacy.
- 5) Consider the following statements regarding Maharshi Dayanand Saraswati:
1. He founded the Arya Samaj with the primary objective of returning Hindu society to the original Vedic spirit.
 2. His most influential literary work, *Satyarth Prakash*, emphasizes rational reform and opposes idol worship.
 3. He advocated for a merit-based social order and was a vocal supporter of women's education.

Which of the statements given above are correct?

- (a) 1 and 2 only

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

Solution: D

- Maharshi Dayanand Saraswati was a pivotal figure in India's socio-religious awakening.
- **Statement 1 is correct.** Dayanand Saraswati founded the **Arya Samaj** in 1875 with the aim of reviving what he considered the pristine Vedic tradition. He rejected later accretions in Hindu practice and advocated a return to the authority of the Vedas.
- **Statement 2 is correct.** His seminal work, **Satyarth Prakash**, lays out his reformist ideas. It emphasizes rational inquiry, monotheism, and strongly criticizes idol worship, ritualism, and social evils such as caste discrimination based solely on birth.
- **Statement 3 is correct.** He supported a merit-based varna system determined by qualities and actions rather than heredity. He also championed women's education and opposed child marriage, widow immolation, and other regressive practices.

6) Consider the following sets regarding Bengali women revolutionaries:

Revolutionary	Primary Action	Nature of Contribution
1. Bina Das	Attempted to assassinate Governor Stanley Jackson	Intellectual and Armed Protest
2. Kamala Das Gupta	Participated in the Chittagong Armoury Raid	Covert Resistance and Logistics
3. Matangini Hazra	Led a Quit India procession in Tamluk	Grassroots Mobilisation

How many of the sets given above are correctly matched?

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

Solution: B

- **Set 1 is correctly matched.** Bina Das's attempt to assassinate Governor Stanley Jackson at her convocation was a direct act of armed protest. This was complemented by her intellectual defiance, such as wearing khadi and writing about banned books, making her a symbol of both forms of resistance.
- **Set 2 is incorrectly matched.** While Kamala Das Gupta was a key member of the Jugantar group involved in covert resistance and logistics like smuggling arms, the **Chittagong Armoury Raid** is primarily associated with **Kalpna Datta** and Surya Sen. Kamala Das Gupta's role was different, focusing on maintaining underground networks.
- **Set 3 is correctly matched.** Matangini Hazra, an elderly widow known as "Gandhi Buri," became a powerful symbol of **grassroots mobilisation**. Her leadership of a Quit India Movement procession, while holding the national flag until she was shot dead, exemplified popular, non-elite participation in the freedom struggle.

7) With reference to the Serengsia Battle of 1837, consider the following statements:

1. It was an armed resistance by the Ho Adivasis against the expansionist policies of the East India Company.
2. The conflict took place in the Serengsia valley located in the present-day state of Chhattisgarh.
3. The Ho fighters utilized guerrilla warfare tactics, including the use of environmental obstacles and burning organic mixtures.

How many of the above statements are correct?

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

Solution: B

- The Serengsia Battle of 1837 is a landmark event in the history of tribal resistance in India. It involved the **Ho Adivasis** of the Kolhan region, who rose against the East India Company's attempts to impose British administration, alien taxes, and non-tribal settlement. The Ho community traditionally governed the Kolhan region, but by 1836, the British had established the Kolhan Estate Government, sparking fierce opposition. **Statement 1 is correct** as it accurately identifies the combatants and the cause.
- **Statement 3 is also correct** regarding the tactics used. The Ho fighters, led by figures like **Poto Ho**, leveraged the difficult terrain of the Serengsia valley. They employed **guerrilla-style warfare**, using bows and arrows and creating obstacles on narrow paths. They even used innovative methods like burning cow dung mixed with ash and chilli powder to deter the British forces. Despite their bravery, the resistance eventually faced brutal retaliation.
- However, **Statement 2 is incorrect** because the Serengsia valley is located in present-day **Jharkhand** (specifically West Singhbhum), not Chhattisgarh. The battle remains a symbol of tribal sovereignty and influenced the eventual recognition of Kolhan's distinct administrative status.

8) Consider the following statements regarding the Kakori Train Robbery:

1. The action was carried out by members of the Hindustan Socialist Republican Association (HSRA) to fund their activities.
2. The incident resulted in the capture and execution of all key participants, including Chandrashekhar Azad.
3. The robbery took place on a train carrying a British government treasury between Saharanpur and Lucknow.

How many of the above statements are incorrect?

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

Solution: B

- **Statement 1 is incorrect.** The robbery was conducted on 9 August 1925 by members of the **Hindustan Republican Association (HRA)**. The organisation was later reorganised and renamed the Hindustan Socialist Republican Association (HSRA) in 1928, after the incident, under leaders like Bhagat Singh.
- **Statement 2 is incorrect.** While key figures like Ram Prasad Bismil, Ashfaqulla Khan, Rajendra Lahiri, and Roshan Singh were captured and hanged, **Chandrashekhar Azad successfully evaded capture** and continued his revolutionary activities for several years until his death in 1931.
- **Statement 3 is correct.** The revolutionaries targeted the **8-Down train** travelling from Saharanpur to Lucknow, as it was known to be carrying British government treasury funds, which they intended to seize for their movement. Therefore, only one statement is correct.

9) Match the following Monasteries with the States they are located in:

List I (Monastery)	List II (State)
A. Bomdila	1. Assam
B. Tashiding	2. Arunachal Pradesh
C. Namphake	3. Tripura
D. Venuvan Vihara	4. Sikkim

Select the correct answer using the code given below:

- (a) A-2, B-4, C-3, D-1
- (b) A-4, B-2, C-3, D-1
- (c) A-2, B-4, C-1, D-3
- (d) A-4, B-2, C-1, D-3

Solution: C

- The Buddhist Circuit initiative spans several northeastern states, each housing unique monastic traditions.
- **Bomdila Monastery** (Arunachal Pradesh) was established in 1965 and is a major center for the **Mahayana sect**.
- **Tashiding Monastery** (Sikkim) is considered the holiest in the state; local belief holds that merely seeing it cleanses one of sins. **Namphake Monastery** (Assam), located near Dibrugarh, belongs to the **Tai-Phake community** and represents the **Theravada tradition**, known for its distinct architecture.
- **Venuvan Vihara** (Tripura) is located in Agartala and features a metal Buddha statue from Myanmar, serving as a hub for the local Buddhist community.
- Other key sites mentioned in the budget context include the **Golden Pagoda (Namsai)** in Arunachal, which also follows the Theravada tradition, and the **Ghoom Monastery** in West Bengal (Darjeeling), famous for its **Maitreya Buddha** statue. The inclusion of these sites in a unified circuit is intended to boost **cultural tourism** and local livelihoods.

10) With reference to the development of the Buddhist Circuit in the Northeast, consider the following statements:

1. The Tawang Monastery is the largest monastery in the world.
2. Urgelling Monastery is significant as the birthplace of the 6th Dalai Lama.
3. The Rumtek Monastery in Sikkim serves as the seat-in-exile of the Gyalwang Karmapa.

How many of the above statements are correct?

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

Solution: B

- The Union Budget 2026–27 announced a new scheme to develop a **Buddhist Circuit in the Northeast** to promote heritage tourism.
- **Statement 1 is incorrect** because while **Tawang Monastery (Galden Namgyal Lhatse)** is the largest in India, it is the **second-largest in the world** (after the Potala Palace). It sits at 10,000 feet and was founded in the 17th century.
- **Statement 2 is correct; Urgelling Monastery** is a 15th-century structure famous as the birthplace of the **6th Dalai Lama**.
- **Statement 3 is correct; Rumtek Monastery** is the largest in Sikkim and the seat of the **Kagyu sect's Gyalwang Karmapa**.
- The budget supports these sites through the **Purvodaya initiative**, which includes creating five tourism destinations and deploying **4,000 e-buses** to improve connectivity. This integrated approach aims to link cultural conservation with regional industrial growth through **CITY Economic Regions (CERs)** and the **East Industrial Corridor**.

9. Agriculture

- 1) Consider the following statements regarding the product coverage and functions of APEDA:
1. It is responsible for the export promotion of fruits, vegetables, and meat products.
 2. The authority has no role in the promotion of herbal or medicinal plants.
 3. It provides financial assistance for the improvement of packaging and value addition of scheduled products.

How many of the above statements are correct?

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

Solution: B

- **Statement 1 is correct;** APEDA has a **wide product coverage** that includes fruits, vegetables, meat, dairy, and poultry. Its primary mission is to boost the global reach of these Indian agricultural goods.
- **Statement 2 is incorrect** because APEDA's mandate specifically includes **herbal and medicinal plants**, along with other items like floriculture, honey, and cashew nuts. It is a common misconception that APEDA only deals with food crops; its scope is actually much broader.
- **Statement 3 is correct;** one of APEDA's key functions is to provide **financial assistance and support** for packaging, labeling, and value addition. This is crucial because global markets have strict standards regarding the aesthetics and shelf-life of products. By promoting improved packaging and value-added processing, APEDA helps Indian exporters remain competitive in high-value markets like the EU and North America.
- It also issues the **Registration-cum-Membership Certificate (RCMC)**, which is a mandatory requirement for exporters of the products listed in its schedule. Through these functions, APEDA acts as a bridge between Indian farmers and the international consumer, facilitating growth in the secondary agricultural sector.

- 2) Consider the following statements about hydroponics:

1. Hydroponics relies on nutrient-rich soil that is periodically flooded and drained to nourish plants.
2. This method is best suited for outdoor environments where ample sunlight can support plant growth.
3. Hydroponics allows for greater control over nutrient levels, which can result in higher yields in limited spaces.

How many of the above statements is/are correct?

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

Solution: A

Statement 1 is incorrect because **hydroponics is a soil-free method**; instead, it uses nutrient-rich water solutions to grow plants, eliminating the need for soil.

Statement 2 is also incorrect, as **hydroponics is often used in controlled indoor environments rather than outdoors**. This setup allows for precise control of light, temperature, and nutrients, essential in spaces where outdoor conditions are unfavorable.

Statement 3 is correct; hydroponics offers significant control over nutrient levels, water, and growth conditions, leading to higher yields even in limited spaces. The controlled environment reduces risks of pests and diseases, and maximizes efficiency, making it ideal for urban agriculture or areas with limited agricultural land.

- 3) Consider the following statements regarding the strategic shift towards Livestock and Fisheries as drivers of agricultural growth:

1. The livestock and fisheries sectors generally exhibit lower price volatility compared to traditional food grains due to the absence of a Minimum Support Price (MSP) framework.
2. The shift toward these sectors represents a transition from "food security" focused on calories to "nutritional security" focused on proteins.
3. Diversification into livestock is considered an effective "climate-resilient" strategy because animals are less susceptible to rainfall variability than rain-fed crops.

Which of the statements given above are correct?

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

Solution: D

- Statement 1 is incorrect. In fact, livestock and fisheries often face **higher price volatility** than food grains precisely because they lack a robust MSP framework and are highly perishable, making them sensitive to market demand-supply shocks.
- However, Statement 2 is correct: the "Big Push" reflects a policy evolution. While India achieved food security through cereals, the focus is now on **nutritional security**, where animal-based proteins (milk, eggs, meat, fish) play a vital role.
- Statement 3 is correct. Livestock acts as a **natural insurance** for small and marginal farmers. While a drought can completely destroy a crop, livestock can often survive on stored fodder or be moved, providing a continuous income stream even when crops fail due to rainfall variability. This makes the sector a cornerstone of **climate adaptation** strategies.
- The budget's emphasis on "Professionalization" and "Value Chains" aims to mitigate the volatility mentioned in Statement 1 by creating better storage, processing, and market linkages through FPOs.

10. Defence and Security

1) Consider the following pairs of Military Exercises:

| Exercise | Participating Nations | Focus Area

- | 1. DHARMA GUARDIAN | India and Japan | Semi-urban environment operations |
- | 2. VAJRA PRAHAR | India and USA | Special operations in mountainous terrain |
- | 3. SAMPRITI | India and Israel | Coastal security and anti-piracy |

Which of the pairs given above are correct?

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

Solution: C

- Military exercises are vital for **interoperability** and strategic cooperation.
- **Pair 1 is correct; Exercise DHARMA GUARDIAN** is an annual bilateral exercise between the **Indian Army** and the **Japan Ground Self-Defense Force**. It focuses on tactical drills in **semi-urban environments**, incorporating modern technology like **ISR (Intelligence, Surveillance & Reconnaissance)** grids.
- **Pair 2 is correct; Exercise VAJRA PRAHAR** involves the **Special Forces** of India and the **US (Green Berets)**. It is specifically designed to enhance coordination in **mountainous terrain**, focusing on mission planning and specialized tactics.
- **Pair 3 is incorrect; SAMPRITI** is a bilateral exercise between **India and Bangladesh**, not Israel. India and Israel share deep defense ties, including R&D and supply of defense systems, but the specific exercise mentioned is mispaired.

- These joint operations help participating nations share **best practices** and improve **operational readiness** against common security threats, such as terrorism or regional instability, through realistic combat simulations.
- 2) Consider the following statements regarding MILAN exercise:
- Statement I: The MILAN exercise serves as a platform for India's "Act East Policy" and the "MAHASAGAR" vision.
- Statement II: The exercise is hosted biennially by the Indian Navy at the Andaman and Nicobar Command.
- Which one of the following is correct in respect of the above statements?
- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Solution: C

- Statement I is correct. MILAN is a cornerstone of India's **maritime diplomacy**, aligning with the "Act East Policy" by engaging heavily with ASEAN, and the "MAHASAGAR" vision, which emphasizes security and growth for all in the region.
 - Statement II is incorrect. While MILAN was traditionally held at Port Blair (Andaman and Nicobar Command) since its inception in 1995, recent large-scale editions, including MILAN 2022, 2024, and **MILAN 2026**, have been shifted to **Visakhapatnam** (Eastern Naval Command). This shift was necessitated by the need for more sea space and better infrastructure to accommodate the increasing number of participating foreign warships.
- 3) Consider the following statements regarding Solid Fuel Ducted Ramjet (SFDR):
1. It is an air-breathing propulsion system that uses atmospheric oxygen for combustion, thereby eliminating the need for an onboard oxidiser.
 2. The technology uses liquid fuel burned in a controlled manner to provide sustained thrust at subsonic speeds.
 3. Initial acceleration to the required Mach number is provided by a nozzle-less ground booster.

Which of the statements given above are correct?

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

Solution: C

- Solid Fuel Ducted Ramjet (SFDR) is a cutting-edge **air-breathing propulsion system** developed by the Defence Research and Development Organisation (DRDO). Unlike conventional rocket motors that carry both fuel and oxidiser, SFDR **utilises atmospheric oxygen** for combustion. This design significantly reduces the weight of the missile, allowing for a **larger fuel load** and, consequently, a vastly **extended operational range**.
- The system operates by burning **solid fuel** in a controlled manner, regulated by a fuel flow controller, to provide sustained thrust. A crucial distinction is that SFDR is designed for **supersonic speeds** rather than subsonic ones. To reach the speeds necessary for the ramjet to function, the missile uses a **nozzle-less ground booster** for initial acceleration. Once the required Mach number is achieved, the booster is jettisoned, and the ramjet takes over.
- This technology is a major breakthrough for India's **Beyond Visual Range Air-to-Air Missiles (BVRAAM)**. It ensures that the missile maintains **high energy throughout its flight**, particularly in the terminal phase. This high velocity in the end-game makes it extremely difficult for enemy aircraft to perform evasive manoeuvres. The successful demonstration at the Integrated Test Range, Chandipur, marks a significant step toward **Atmanirbhar Bharat** in advanced missile propulsion, reducing dependence on foreign military technology.

- 4) With reference to the Agni-3 Intermediate-Range Ballistic Missile (IRBM), consider the following statements:
1. It is a three-stage missile system primarily utilizing liquid fuel propulsion to ensure high accuracy.
 2. The missile is capable of delivering both conventional and nuclear payloads to targets up to 3,000 km.
 3. It is developed and operationally deployed under the direct command of the Defence Research and Development Organisation (DRDO).

How many of the above statements are correct?

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

Solution: A

- The Agni-3 Intermediate-Range Ballistic Missile (IRBM) is a cornerstone of India’s strategic deterrence. Contrary to statement 1, it is a **two-stage solid-fuel missile**, not a three-stage liquid-fuel system.
- Solid propulsion is preferred for strategic missiles as it allows for quicker launch readiness and easier storage. **Statement 2 is correct**; its range is **approximately 3,000 km**, placing it firmly in the intermediate category, and it is designed to carry **strategic (nuclear) as well as conventional payloads**.
- **Statement 3 is incorrect** regarding deployment; while the **DRDO** developed the missile, its operational deployment and command fall under the **Strategic Forces Command (SFC)**, which is part of India’s Nuclear Command Authority.
- The recent successful test-firing from **Chandipur, Odisha**, was aimed at validating its operational readiness under the SFC. This system complements other variants like Agni-1 and Agni-5, providing a **credible minimum deterrence** and a robust **second-strike capability**. The guidance system uses **advanced inertial navigation**, ensuring high circular error probable (CEP) accuracy.

- 5) Consider the following pairs of Military Exercises and the participating entities:

| Exercise | Participants |

- | 1. Exercise Khanjar | India and Kyrgyzstan |
- | 2. Exercise Agni Pariksha | Indian Army and ITBP |
- | 3. Exercise Vayu Shakti | Indian Air Force and French Air Force |

How many of the above pairs are correctly matched?

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

Solution: B

- **Pair 1 is correctly matched. Exercise Khanjar** is an annual bilateral exercise between the Special Forces of **India and Kyrgyzstan**. The 13th edition (2026) was held in Assam, focusing on counter-terrorism, urban warfare, and mountain operations.
- **Pair 2 is correctly matched. Exercise Agni Pariksha** is a unique internal joint training exercise involving the **Indian Army and the Indo-Tibetan Border Police (ITBP)**. It aims to familiarise infantry and ITBP personnel with artillery firing procedures to improve inter-force combat integration on the borders.
- **Pair 3 is incorrectly matched. Exercise Vayu Shakti** is not a bilateral exercise with a foreign country; it is a **triennial internal demonstration** of the **Indian Air Force's (IAF)** air power and precision strike capabilities. Held at the Pokaran range in Rajasthan, it involves various IAF units showcasing indigenous systems like the Tejas and Akash.

- 6) Match the following Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) International Monitoring System (IMS) technologies with their respective purposes:

List I (Technology)	List II (Purpose)
A. Seismic	1. Detects underwater nuclear explosions

List I (Technology)	List II (Purpose)
B. Hydroacoustic	2. Detects low-frequency sounds from atmospheric nuclear explosions
C. Infrasound	3. Monitors ground shockwaves from underground explosions
D. Radionuclide	4. Confirms nuclear explosions by detecting radioactive particles

Select the correct answer code:

- a) A-2, B-3, C-4, D-1
- b) A-3, B-1, C-2, D-4
- c) A-1, B-2, C-3, D-4
- d) A-1, B-3, C-2, D-4

Solution: B

- A (Seismic) - 3: Seismic technology detects ground shockwaves and vibrations, making it effective for monitoring underground nuclear explosions.
- B (Hydroacoustic) - 1: Hydroacoustic technology identifies underwater nuclear explosions by monitoring sound waves that travel through water.
- C (Infrasound) - 2: Infrasound technology is designed to detect low-frequency sounds in the atmosphere, useful for identifying atmospheric nuclear tests.
- D (Radionuclide) - 4: Radionuclide technology confirms nuclear tests by detecting radioactive particles in the air, which are direct indicators of nuclear explosions.

7) Consider the following statements regarding the features of cyberspace:

1. Actions in cyberspace are confined by national borders, and their impact is localized.
2. Cyberspace has a dual-use nature, serving both civilian and military purposes.
3. Attribution of actions in cyberspace is straightforward due to the traceable nature of digital footprints.

Which of the above statements are correct?

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

Solution: A

- **Statement 1 is incorrect.** A defining feature of cyberspace is that it is a **borderless domain**. Actions taken in cyberspace can have immediate, global effects, transcending physical and national boundaries. A cyber-attack launched from one country can impact critical infrastructure in another country thousands of miles away.
- **Statement 2 is correct.** Cyberspace has a **dual-use nature**. The same infrastructure, technologies, and platforms can be used for both civilian purposes (e.g., e-commerce, communication, education) and military purposes (e.g., intelligence gathering, command and control, cyber warfare). This duality presents unique challenges for governance and security.
- **Statement 3 is incorrect. Attribution in cyberspace is a significant challenge.** Malicious actors can use various techniques, such as proxy servers, VPNs, and sophisticated malware, to obscure their identity and location, making it difficult to definitively trace an attack back to its source. The anonymity or pseudonymity afforded by cyberspace is one of its key features and a major hurdle for law enforcement and national security agencies.

8) With reference to the Intermediate-Range Nuclear Forces (INF) Treaty, consider the following statements:

Statement I: The INF Treaty was the first arms control agreement to eliminate an entire class of weapons.

Statement II: The treaty banned all ground-launched ballistic and cruise missiles with ranges between 500 and 5,500 kilometers.

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

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

Solution: A

- The Intermediate-Range Nuclear Forces (INF) Treaty, signed in 1987 between the United States and the Soviet Union, was a landmark achievement in arms control.
- **Statement I is correct** because the treaty was the **first of its kind to eliminate an entire category of weapons**, rather than just imposing limits on their numbers. This was a significant step towards de-escalation during the Cold War.
- **Statement II is also correct** and provides the specific details of the weapons that were eliminated. The treaty mandated the destruction of all **ground-launched ballistic and cruise missiles** with ranges between **500 and 5,500 kilometers**. This specific range of missiles was considered particularly destabilizing as they could strike targets in Europe with very little warning time.
- Statement II is the correct explanation for Statement I.

11. Reports and Indices

- 1) Consider the following statements regarding the Network Readiness Index (NRI) 2025:
1. It is an annual publication of the International Telecommunication Union (ITU) in collaboration with the World Bank.
 2. The index evaluates countries based on **four primary pillars: Technology, People, Governance, and Impact**.
 3. India's performance in 2025 shows that its network readiness is significantly lower than expected for its income level.

How many of the above statements are correct?

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

Solution: A

- **Statement 1 is incorrect.** The NRI is prepared and published by the **Portulans Institute**, an independent non-profit research institute based in Washington, D.C.
- **Statement 2 is correct.** The index framework is built on **four pillars**: Technology (infrastructure and access), People (skills and inclusion), Governance (regulation and trust), and Impact (economic and social outcomes). Each pillar is further broken down into specific indicators like AI research and broadband penetration.
- **Statement 3 is incorrect.** The 2025 report specifically highlights that **India's network readiness exceeds expectations** for its income level. In fact, India is ranked 2nd among lower-middle-income countries. India has shown strong growth, climbing to the **45th rank globally**, and leads in specific sub-indicators such as **AI scientific publications** and annual investment in telecommunication services.

12. Maps / Places

- 1) The "Cikai Korran" name, recently discovered in the Valley of the Kings, Egypt, provides evidence for which of the following?
- The spread of Buddhism to North Africa during the Ashokan period.
 - The diplomatic missions sent by the Chola Empire to the Mediterranean.
 - The presence of Tamil traders or visitors in the Nile Valley during the Roman era
 - The migration of Indus Valley people to the Egyptian civilization.

Solution: C

- The discovery of **Tamil Brahmi inscriptions** in the Valley of the Kings is a significant archaeological milestone.
- Option (c) is the correct answer.** These inscriptions, dating from the 1st to 3rd centuries CE, include the repeated name "**Cikai Korran**" across multiple tombs. This suggests that Indian individuals, likely traders or maritime travelers, were not just visiting coastal ports like **Berenike** on the Red Sea but were traveling deep into the Egyptian mainland along the **Nile River**.
- The presence of Tamil, Prakrit, and Sanskrit names indicates a diverse group of Indians involved in **Indo-Roman trade networks**. This period corresponds to the Sangam era in South India, known for its flourishing maritime commerce. The inscriptions were found alongside Greek graffiti, showing that Indian visitors followed the local custom of commemorating their presence in sacred or significant sites.
- This discovery reinforces the historical depth of **trans-oceanic cultural interactions** and proves that the ancient world was highly interconnected through robust trade routes.

- 2) Consider the following statements regarding the Congo Basin lakes:
- The blackwater appearance of Lakes Mai Ndombe and Tumba is due to low concentrations of humic acids.
 - These lakes act as a significant source of CO₂ emissions because of the decomposition of ancient peat carbon.
 - The Tumba-Ngiri-Maindombe area is recognized under the Ramsar Convention as a Wetland of International Importance.
 - Peat formation in this region occurs when dead vegetation accumulates slower than it decomposes in oxygen-rich conditions.

How many of the above statements are correct?

- Only one
- Only two
- Only three
- All four

Solution: B

Explanation:

- Statement 1 is incorrect;** the **blackwater** appearance is actually due to **high concentrations** (not low) of dissolved organic matter and **humic acids**.
- Statement 2 is correct;** research shows that up to 40% of the CO₂ from these lakes comes from **ancient peat carbon** (over 3,000 years old) being released into the atmosphere.
- Statement 3 is correct;** the area is the **world's largest Ramsar site**.
- Statement 4 is incorrect;** **peat formation** occurs when vegetation accumulates **faster than it decomposes**, and this happens specifically in **oxygen-poor (anaerobic)**, waterlogged conditions, not oxygen-rich ones.
- The "Central Basin" or **Cuvette Centrale** is a unique environment where climate change and drying are now "reactivating" these ancient stores, posing a threat to global carbon budgets. Protecting these wetlands is crucial because they cover only 0.3% of land but hold a disproportionate amount of tropical carbon.

- 3) Morocco shares its border with which of the following water bodies?

- Mediterranean Sea

2. Atlantic Ocean
3. Caspian Sea

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

Solution: A

Option 3 is incorrect.

Morocco, a North African country bordering the **Atlantic Ocean and the Mediterranean Sea**, is distinguished by its Berber, Arabian and European cultural influences.



4) In which province and country is Mount Aconcagua located?

- (a) Antofagasta, Chile
- (b) Mendoza, Argentina
- (c) Pichincha, Ecuador
- (d) La Paz, Bolivia

Solution: B

- Mount Aconcagua is specifically located in the **Mendoza Province of Argentina**. It sits in the Central Andes, very close to the international border with Chile, but the summit itself falls within Argentine territory.
- Mendoza is famous not only for this peak but also as a hub for mountaineering and viticulture. The mountain's location in the **Southern Andes** places it in a region characterized by dramatic **tectonic uplift**. As the **highest peak outside Asia**, it attracts thousands of climbers annually who attempt to summit via the "Normal Route" or more challenging faces like the Polish Glacier.
- The peak's prominence makes it a landmark of the **Southern Hemisphere**. Its geological history, being of **volcanic origin** but currently inactive, provides a unique look into the formation of the Andean range.
- The surrounding **Aconcagua Provincial Park** protects the biodiversity and glacial systems of the region.

5) Regarding the geographical features of the Middle East, consider the following pairs:

- | Feature | Location / Detail |
|---------------------|---|
| 1. Strait of Hormuz | Connects Persian Gulf and Gulf of Oman |
| 2. Hajar Mountains | Located in the northeast UAE and Oman |
| 3. Wadis | Perennial rivers flowing through the desert |

Which of the pairs given above is/are correctly matched?

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

Solution: C

- The geography of the UAE and the surrounding region is defined by its arid climate and strategic maritime position.
 - **Pair 1 is correctly matched**; the **Strait of Hormuz** is a vital chokepoint that connects the **Persian Gulf** to the **Gulf of Oman** and the wider Arabian Sea. It is one of the most important oil transit routes in the world.
 - **Pair 2 is also correctly matched**; the **Hajar Mountains** run through the northeastern part of the UAE and into Oman, reaching heights of approximately 2,000 meters. They provide a distinct landscape compared to the vast sand dunes of the interior.
 - **Pair 3 is incorrectly matched**. The UAE has **no perennial rivers**. Instead, it has **wadis**, which are **seasonal or ephemeral watercourses** that remain dry for most of the year, filling only during rare, heavy rainfall. The drainage system is characterized by these wadis rather than permanent river systems.
- 6) Which of the following geographical features is NOT characteristic of Japan?
- (a) Four distinct seasons with abundant rainfall
 - (b) Frequent seismic and volcanic activity
 - (c) A landscape dominated by extensive, flat plains
 - (d) Location on the Pacific "Ring of Fire"

Solution: C

- **(a) is a characteristic feature**. Japan has a temperate climate with **four distinct seasons** and generally experiences **abundant rainfall**, which supports its lush forests and agricultural activities.
 - **(b) is a characteristic feature**. Due to its location on the "Ring of Fire", Japan experiences **frequent earthquakes, tsunamis, and volcanic eruptions**.
 - **(c) is NOT a characteristic feature**. The Japanese landscape is predominantly **mountainous**, with nearly 80% of the land consisting of mountains. While there are some fertile plains, such as the Kanto Plain, they are not the dominant feature of the landscape. Extensive, flat plains are not a characteristic of Japan's geography.
 - **(d) is a characteristic feature**. Japan is situated on the **Pacific "Ring of Fire"**, which is a major area in the basin of the Pacific Ocean where a large number of earthquakes and volcanic eruptions occur.
- 7) With reference to the geography of Japan, consider the following statements:
1. The country is an archipelago consisting of four main islands: Honshu, Hokkaido, Kyushu, and Okinawa.
 2. Mount Fuji is the highest peak in Japan.
 3. The Kanto Plain is the most extensive and productive agricultural region in Japan.

Which of the above statements are correct?

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

Solution: C

Japan is an island country in East Asia with a distinctive geography.

- **Statement 1 is incorrect**. Japan's four main islands are **Honshu, Hokkaido, Kyushu, and Shikoku**. Okinawa is part of the Ryukyu Islands, which is a smaller island group to the southwest of the main islands.
- **Statement 2 is correct**. **Mount Fuji is the highest mountain in Japan** and is an active stratovolcano that last erupted in 1707–1708. While it is currently classified as active, it has been dormant for over 300 years.

- **Statement 3 is correct.** The **Kanto Plain** is the largest plain in Japan and is a major center for agriculture, industry, and population. It includes the Tokyo metropolitan area and is one of the most fertile and economically important regions of the country.

- 8) Consider the map of North Africa. If one were to travel in a straight line from Algiers, the capital of Algeria, to the Ahaggar Mountains in the south, which of the following geographical features would one most likely cross?
1. The Tell Atlas range
 2. The Saharan Atlas range
 3. The Mediterranean Sea
 4. The Chelif River

Select the correct answer using the code given below:

- (a) 3 and 4 only
- (b) 1, 2 and 4 only
- (c) 1 and 2 only
- (d) 1, 2, 3 and 4

Solution: B

- The journey starts in **Algiers**, which is located on the Mediterranean coast.
- **1. The Tell Atlas:** Immediately south of the coastal plains where Algiers lies, one would encounter the Tell Atlas mountain range, which runs parallel to the coast. This is the first major geographical barrier to cross.
- **2. The Saharan Atlas:** Further south of the Tell Atlas and the high plateaus separating the two ranges, one would have to cross the Saharan Atlas. This range acts as the northern edge of the Sahara Desert.
- **3. The Mediterranean Sea:** The journey is from north to south, starting from the coast and moving inland. Therefore, one would be travelling away from the Mediterranean Sea, not crossing it. This statement is incorrect.
- **4. The Chelif River:** The Chelif River is the longest river in Algeria. Its basin lies in the region of the Tell Atlas and the high plateaus. A straight-line path from Algiers to the southern Ahaggar Mountains would almost certainly cross the path or basin of this significant wadi system.



- 9) Match the Following:

Phenomenon (Col 1)	Atmosphere Layer (Col 2)	Typical Impact (Col 3)
I. Tropospheric Polar Vortex	A. Lower Atmosphere	1. Direct Weather Events
II. Stratospheric Polar Vortex	B. Higher Atmosphere	2. Strongest in Winter

Select the correct answer using the code given below:

- (a) I-B-2 and II-A-1
- (b) I-B-1 and II-A-2
- (c) I-A-2 and II-B-1

(d) I-A-1 and II-B-2

Solution: D

The **Polar Vortex** exists in two distinct layers of the atmosphere.

The **Tropospheric Polar Vortex (I)** resides in the lower atmosphere (A), where our weather occurs, and its movements are directly responsible for the cold snaps and storms (1) we experience at the surface.

The **Stratospheric Polar Vortex (II)** exists in the higher atmosphere (B) and is generally **strongest during the winter (2)**. When the stratospheric vortex is disrupted by events like Sudden Stratospheric Warming, it can influence the tropospheric vortex below, leading to a wavy jet stream. This interaction causes extreme cold surges in mid-latitude regions like North America and Europe.

10) Consider the following geographical features of Seychelles:

1. It is a republic consisting of both granitic, mountainous islands and low-lying coralline atolls.
2. The archipelago is located in the Northern Hemisphere, just above the Equator in the Arabian Sea.
3. Aldabra Atoll, a UNESCO World Heritage site, is part of this island nation.

Which of the statements given above are correct?

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

Solution: C

- **Statement 1 is correct.** Seychelles is a **Small Island Developing State (SIDS)** comprising two distinct groups: the **Mahé group** (over 40 mountainous, granitic islands) and the **Outer Islands** (over 70 flat, coralline atolls).
- **Statement 2 is incorrect.** Seychelles is located in the **Southern Hemisphere** (between 4°–11° S latitudes) and is situated in the **western Indian Ocean**, not the Arabian Sea. It lies northeast of Madagascar and east of Kenya.
- **Statement 3 is correct.** Seychelles is home to two UNESCO World Heritage Sites: the **Aldabra Atoll** and the **Vallée de Mai National Park**. Recently, India and Seychelles announced the **“SESEL” Joint Vision**, marking 50 years of diplomatic ties. This vision emphasizes **maritime security**, digital infrastructure, and climate resilience, reinforcing Seychelles as a key pillar in India’s **MAHASAGAR vision** for the Indian Ocean Region.

11) With reference to Mount Aconcagua, consider the following statements:

1. It is the highest peak in both the Southern and Western Hemispheres.
2. It is an active stratovolcano located in the Northern Andes.
3. The peak is situated entirely within the borders of Chile.

How many of the above statements are correct?

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

Solution: A

- Mount Aconcagua is a mountain of extremes.
- Statement 1 is correct; at approximately **22,831 feet (6,959 m)**, it is the **highest point in the Western Hemisphere, Southern Hemisphere**, and the tallest peak outside of Asia.
- Statement 2 is incorrect; while it is of **volcanic origin**, it is **not an active volcano**. Furthermore, it is located in the **Southern Andes** in the western **Mendoza Province of Argentina**, near the border with Chile.
- Statement 3 is incorrect; while it is very close to the Argentina-Chile border, the peak itself is located **within the Mendoza Province of Argentina**.

12) Match the following features of the Chabahar Port with their correct descriptions:

Column A (Feature)	Column B (Location/Province)	Column C (Strategic Context)
1. Shahid Beheshti	(i) Sistan–Baluchestan	(X) Multipurpose cargo terminal
2. Gwadar Port	(ii) Balochistan (Pakistan)	(Y) Counter-balance to CPEC
3. Bandar Abbas	(iii) Hormozgan (Iran)	(Z) Persian Gulf transit hub

Select the correct answer using the code given below:

- (a) 1-(ii)-(Y), 2-(iii)-(Z), 3-(i)-(X)
 (b) 1-(iii)-(Z), 2-(i)-(X), 3-(ii)-(Y)
 (c) 1-(i)-(X), 2-(ii)-(Y), 3-(iii)-(Z)
 (d) 1-(i)-(Y), 2-(ii)-(X), 3-(iii)-(Z)

Solution: C

- **Chabahar Port** is India's strategic gateway to Central Asia. The port consists of two main terminals: **Shahid Beheshti** and **Shahid Kalantari**.
- Shahid Beheshti (1-i-X) is the primary terminal located in **Sistan–Baluchestan province**, designed to handle container and **multipurpose cargo**.
- **Gwadar Port** (2-ii-Y) is located in Pakistan's Balochistan province, just 170 km east of Chabahar; it is a key part of the **China-Pakistan Economic Corridor (CPEC)**, and Chabahar acts as a geopolitical **counter-balance** to it.
- **Bandar Abbas** (3-iii-Z) is Iran's other major port located in the **Persian Gulf** (Hormozgan province); however, unlike Chabahar, it is not an oceanic port and has capacity limitations for the largest ocean-going vessels. Chabahar's direct access to the **Indian Ocean** (Gulf of Oman) makes it superior for regional connectivity. In 2024, India signed a **10-year contract** for operations, including a **\$250 million Line of Credit**. This project is central to the **International North–South Transport Corridor (INSTC)**, bypassing Pakistan to reach **Afghanistan and Central Asia**. Its significance extends to **humanitarian aid**, as seen in wheat shipments to Afghanistan, and economic integration through **road–rail projects** connecting to the broader Eurasian network.

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13) Karimpuzha Wildlife Sanctuary, recently in the news, is located in which state?

- (a) Tamil Nadu
 (b) Karnataka
 (c) Kerala
 (d) Andhra Pradesh

Solution: C

- The **Karimpuzha Wildlife Sanctuary** is located in the **Malappuram district of Kerala**. Notified in 2020, it is the state's **18th Wildlife Sanctuary**. It is part of the Nilambur forest landscape and is situated on the western slopes of the Nilgiris (Option c is correct).
- The sanctuary is notable for its exceptional biodiversity and is the first wildlife sanctuary in Malappuram.
- Recent faunal surveys in the sanctuary have discovered several new species of birds and butterflies, highlighting its importance as a biodiversity hotspot.
- The sanctuary's intact forest ecosystems, ranging from lowland semi-evergreen to high-altitude montane grasslands, make it a genetic refuge within the Western Ghats.

14) Consider the following statements regarding the Rafah Border Crossing:

1. It is the only crossing point between the Gaza Strip and Egypt.
2. It is situated along the historic Philadelphi (Salah al-Din) corridor.
3. The European Union Border Assistance Mission (EUBAM) has historically played a monitoring role at this crossing.

Which of the statements given above are correct?

- (a) 1 and 2 only
 (b) 2 and 3 only

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

Solution: D

- The **Rafah Border Crossing** is strategically unique as it is the only exit point from the Gaza Strip that does not lead into Israel, connecting Gaza directly with **Egypt's Sinai Peninsula** (Statement 1 is correct).
- It is located at the southern tip of the Gaza Strip, along the **Salah al-Din corridor** (also known as the Philadelphi corridor), a narrow strip of land that has been a focal point of security and geopolitical negotiations (Statement 2 is correct).
- Historically, following the 2005 Israeli withdrawal from Gaza, the crossing was managed by the Palestinian Authority with a neutral third-party presence provided by the **European Union Border Assistance Mission (EUBAM)** under the Agreement on Movement and Access (Statement 3 is correct).
- The crossing is a vital humanitarian lifeline for medical evacuations and aid. Its reopening in 2026 under international monitoring and Israeli security oversight is a key part of regional ceasefire efforts. It remains a sensitive site due to its role in controlling the movement of people and goods independently of Israeli-controlled terminals like Erez or Kerem Shalom.



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13. Miscellaneous

1) Consider the following statements:

Statement I: The Sawalkot Hydroelectric Project is a Run-of-the-River (RoR) project being developed on the Chenab River.

Statement II: Under the Indus Waters Treaty, India is permitted to develop RoR projects on Western Rivers for non-consumptive use.

Statement III: Pakistan has no legal right to review or object to any hydroelectric project built by India on the Chenab River.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
(b) Both Statement II and Statement III are correct but only one of them explains Statement I
(c) Only one of the Statements II and III is correct and that explains Statement I
(d) Neither Statement II nor Statement III is correct

Solution: C

- **Statement I is correct;** Sawalkot is an RoR project on the Chenab river under NHPC.
- **Statement II is also correct;** the **Indus Waters Treaty** divides the rivers between India and Pakistan. The Western Rivers (Indus, Jhelum, Chenab) are allocated to Pakistan, but India is specifically allowed to use their

waters for **non-consumptive purposes**, including the generation of hydroelectric power through **Run-of-the-River** projects, provided they meet certain design criteria.

- **Statement III is incorrect.** Pakistan *does* have the right to review and raise objections if it believes the project design violates the treaty's technical parameters (such as pondage, spillway gates, or intake levels). This is why Pakistan has initiated a review of the Sawalkot project.
- **Statement II explains Statement I.** The reason India can develop a project like Sawalkot (Statement I) is precisely because the treaty allows for RoR projects on those specific rivers (Statement II). Therefore, **only one of the statements (II) is correct and explains Statement I.**

2) Consider the following statements regarding the categorization of Central Public Sector Enterprises (CPSEs):

Statement-I: The upgrade of an entity from Schedule 'B' to Schedule 'A' usually leads to a reduction in the need for frequent ministerial approvals for large projects.

Statement-II: Schedule 'A' is the highest tier, comprising large-sized enterprises with significant national and strategic importance.

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

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

Solution: A

- Both statements are correct. Statement-I highlights the **functional significance** of an upgrade: moving to a higher schedule (like Schedule 'A') grants the organization **greater financial and operational powers**. This decentralization reduces the administrative burden of seeking ministerial nods for capital-intensive projects.
- Statement-II provides the **underlying logic** for this autonomy: Schedule 'A' is reserved for the largest and most strategically vital enterprises. Because these entities handle operations of national importance and significant scale, the government empowers their boards with higher-ranking executive positions and greater flexibility.
- The evaluation for such an upgrade is rigorous, involving **quantitative parameters** like net sales, profit before tax, and capital employed over the last five years, alongside **qualitative factors** like technological complexity. Therefore, Statement-II explains why Statement-I occurs: the strategic nature and size of Schedule 'A' firms necessitate the operational freedom mentioned in Statement-I.

3) Consider the following statements:

Statement-I: The Petroleum and Natural Gas Regulatory Board (PNGRB) facilitates the integration of Compressed Biogas (CBG) into the City Gas Distribution (CGD) networks.

Statement-II: The integration of domestically produced CBG reduces the reliance on imported Liquefied Natural Gas (LNG) and enhances India's energy security.

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

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

Solution: A

- **Statement-I is correct** because the PNGRB has recently approved guidelines specifically allowing the injection of **Compressed Biogas (CBG)** into both Natural Gas Pipelines (NGPL) and **City Gas Distribution (CGD)** networks. As a statutory body established under the **PNGRB Act, 2006**, it regulates the midstream and

downstream sectors, ensuring that infrastructure is used efficiently to reach the end consumer.

- **Statement-II is correct** and provides the underlying rationale for the regulatory shift. India currently imports a significant portion of its natural gas requirement as LNG. By mainstreaming "green gas" like CBG—which is produced from agricultural and organic waste—the country utilizes indigenous resources. This integration is crucial for **energy security** as it creates a circular economy, provides a stable evacuation route for CBG producers, and ensures a cleaner fuel mix for the transport and domestic sectors.
 - Since the objective of promoting CBG integration (Statement-I) is driven by the need for energy independence and security (Statement-II), the latter is the correct explanation for the former.
- 4) What physiological factor is primarily responsible for the athletic performance differences between men and women?
- (a) Chromosome count
 - (b) Muscle fiber type
 - (c) Bone density
 - (d) Circulating testosterone levels

Solution: D

Circulating testosterone is considered the primary factor responsible for athletic performance differences between men and women. Testosterone has been shown to increase muscle mass and strength, bone size and density, and circulating hemoglobin levels. These physiological changes contribute significantly to athletic performance advantages. While other factors like bone density and muscle fiber type are influenced by testosterone, they are secondary effects rather than the primary cause. The hormone's direct impact on multiple physiological systems makes it the key differentiator in athletic performance between sexes.

- 5) The 'Urban Challenge Fund (UCF)' focuses on which of the following project verticals?
1. Cities as Growth Hubs
 2. Creative Redevelopment
 3. Water and Sanitation
 4. Rural-Urban Migration Control

Select the correct answer using the code given below:

- (a) 1, 2 and 3 only
- (b) 2, 3 and 4 only
- (c) 1 and 3 only
- (d) 1, 2, 3 and 4

Solution: A

- The UCF is structured around specific high-impact areas to drive urban transformation. The three main verticals are **Cities as Growth Hubs** (focusing on economic productivity), **Creative Redevelopment** (revitalizing existing urban spaces), and **Water & Sanitation** (essential infrastructure for health and resilience).
- Statement 4 is **incorrect** as the fund's mandate is to manage and improve existing urban infrastructure rather than implementing direct demographic controls like migration restriction.
- The scheme aims to make cities **climate-responsive** and **inclusive**, using the ₹1 lakh crore central assistance to catalyze a total investment of approximately ₹4 lakh crore. This is achieved by making projects "bankable" and attractive to private investors.

- 6) With reference to Bharat Taxi, consider the following statements:
1. It is India's first cooperative-sector, driver-owned ride-hailing platform.
 2. The entity is registered under the Multi-State Cooperative Societies Act, 2002.
 3. Unlike private aggregators, it follows a surge-pricing model to ensure higher dividends for driver-shareholders.

How many of the above statements are incorrect?

- (a) Only one

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

Solution: A

- **Bharat Taxi** represents a significant shift in the platform economy by applying the cooperative model to the ride-hailing sector. It is the first of its kind in India where the drivers (Sarathis) are the owners and stakeholders, guided by the principle "**Sarathi hi Malik**" (Statement 1 is correct).
- The operating entity, **Sahkar Taxi Cooperative Limited**, is registered under the **Multi-State Cooperative Societies Act, 2002**, ensuring it operates within the legal framework of Indian cooperatives (Statement 2 is correct).
- However, one of its core unique selling propositions is **surge-free pricing**, which distinguishes it from private aggregators like Ola and Uber that use dynamic pricing algorithms to increase fares during high demand (Statement 3 is incorrect).
- The model focuses on fair income distribution, where the entire fare initially goes to the driver, and profits are redistributed within the cooperative. Additionally, it provides robust social security, including accident and health insurance. The initiative is aligned with the "**Sahkar se Samridhhi**" vision of the Ministry of Cooperation.

7) Consider the following statements regarding Tritium:

1. It is a radioactive isotope of hydrogen whose nucleus contains one proton and three neutrons.
2. It poses a significant health risk through external exposure as its high-energy beta radiation can penetrate human skin.

Which of the above statements are incorrect?

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

Solution: C

- **Statement 1 is incorrect.** Tritium (^3H) is an isotope of hydrogen, but its nucleus contains **one proton and two neutrons**, not three. This gives it a mass number of 3.
- **Statement 2 is incorrect.** Tritium emits **low-energy beta radiation**. This type of radiation **cannot penetrate human skin**, making it a low external hazard. The primary risk from tritium is from internal exposure (inhalation or ingestion), where it can irradiate cells from within the body.

8) Consider the following statements regarding groundwater contamination in India:

1. A significant portion of India's rural drinking water and irrigation needs are met by groundwater.
2. The overuse of chemical fertilizers in agriculture can lead to nitrate contamination of groundwater.
3. Pathogen contamination from sewage leaks is a major anthropogenic source of groundwater pollution.

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

Solution: D

- **Statement 1 is correct.** Over **85% of rural drinking water** and **65% of irrigation needs** in India are dependent on groundwater, making it the lifeline of the country's water economy. This heavy reliance makes the issue of its contamination a critical national concern.

- **Statement 2 is correct.** Agricultural runoff from the overuse of **chemical fertilisers and pesticides** is a primary source of **nitrate and phosphate leaching** into aquifers. States like Punjab and Haryana, with intensive agriculture, face significant nitrate contamination, which can lead to health issues like "Blue Baby Syndrome".
- **Statement 3 is correct.** **Sewage and septic leaks** are a major **anthropogenic (human-induced)** source of groundwater contamination, particularly in peri-urban and rural areas. This introduces pathogens like bacteria and viruses into the water, leading to waterborne diseases such as cholera, dysentery, and hepatitis.



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