

R.C. Reddy IAS Study Circle

UPSC CSE PRELIMS 2025 TEST SERIES

GRAND TEST-02

GENERAL STUDIES

Key with Explanation

Q1. A

What is Coral Bleaching?

- Coral bleaching occurs when corals expel the algae (zooxanthellae) living in their tissues, causing them to turn white.
- These algae are essential for the coral's survival, providing them with energy through photosynthesis.
- When corals are stressed, they expel these algae, leaving them vulnerable.

Causes of Coral Bleaching:

- **Increased Water Temperatures:**
 - The primary cause of coral bleaching is rising ocean temperatures due to climate change.
 - Even small increases in water temperature can trigger bleaching events.

Why some corals escape the bleaching process?

- Some corals are more resilient to bleaching due to their ability to host different species of zooxanthellae (symbiotic algae) that can tolerate higher temperatures.
- These heat-resistant algae can continue photosynthesis under stressful conditions, providing corals with the energy they need to survive.
- While depth, calcium carbonate deposition, and fish grazing can influence coral health, the ability to host thermally resistant algae is the **most direct factor** in explaining survival during a bleaching event.

Q2. C

- **Statement I is correct:** PAN is a secondary pollutant formed through complex chemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. It is a key component of photochemical smog.
- **Statement II is incorrect:** PAN is not directly emitted from vehicular exhaust or industrial emissions. Instead, it is formed in the atmosphere through photochemical reactions involving precursor pollutants like VOCs and NOx, which are emitted from vehicles and industries.

Since Statement I is correct and Statement II is incorrect, the correct answer is c.

Q3. B

	<i>Occupational Diseases</i>	<i>Causing Agents</i>
1	Byssinosis	Cotton Dust
2	Black Lung Disease	Coal Dust
3	Berylliosis	Beryllium Dust/Fumes
4	Farmer's Lung Disease	Grain/Hay Dust

Q4. B

National Air Quality Index (AQI)

- The introduction of the National Air Quality Index (NAQI) in **New Delhi in September 2014** was **part of the Swachh Bharat Abhiyan initiative**, aimed at monitoring India's air quality index.
- The **Central Pollution Control Board (CPCB)** has established a committee of specialists consisting of SPCBs, academicians, medical professionals, and experts in air quality.
- The following **eight significant air pollutants** in the atmosphere are monitored by the Air Quality Index (AQI):
 1. Particulate Matter (PM10)
 2. Particulate Matter (PM2.5)
 3. Nitrogen Dioxide (NO₂)
 4. Sulphur Dioxide (SO₂)
 5. Carbon Monoxide (CO)
 6. Ozone (O₃)
 7. Ammonia (NH₃)
 8. Lead (Pb)

Q5. C

The paper and pulp industry discharges various pollutants into water bodies, including:

- **Chlorinated compounds** (from bleaching processes)
- **Suspended solids** (from raw materials and processing)
- **Heavy metals** (from chemical additives and processing equipment)
- **Dioxins** (formed due to chlorine-based bleaching, highly toxic and persistent in the environment)

While,

- **Microplastics are not a primary pollutant** from the paper and pulp industry; instead, they are more associated with synthetic materials like plastics.

Q6. A

- **Option a is correct:** Industrial emissions release **SO₂ and NO_x**, which form sulfuric and nitric acids in the atmosphere, leading to **acid rain**. Acid rain **lowers soil pH**, leading to **increased ammonia retention** in the soil. It **accelerates metal corrosion** by forming acidic deposits on metal surfaces. It contributes to **black crust formation** (gypsum layers) on buildings by reacting with carbonate minerals in stone structures.
- **Option b is not correct:** While smog degrades materials over time, it does **not directly contribute to ammonia accumulation in soil**.
- **Option c is not correct:** Can contribute to black crust formation but does not explain **ammonia accumulation in soil** or **metal corrosion** comprehensively.
- **Option d is not correct:** Excess ammonia and nitrates contribute to **waterbody pollution**, but they **do not directly cause metal corrosion or black crust formation**.

Q7. A

Adverse Consequences of excessive sand mining:

- **Increased riverbank erosion and instability:** Sand removal weakens riverbanks, causing collapse and increased sedimentation.
- **Saline water intrusion:** Removing sand barriers in coastal regions allows seawater to contaminate freshwater reserves.
- **Destruction of aquatic habitats:** Mining disturbs river ecosystems, displacing fish and other species.
- **Increased sediment deposition downstream:** While mining removes sand from one area, unstable riverbanks collapse, leading to excess sediment accumulation downstream, impacting navigation and water quality.

While,

- **Lower turbidity levels:** Sand mining actually increases turbidity by suspending fine particles in water, reducing clarity and harming aquatic life.
- **Enhanced groundwater recharge:** While removing small amounts of sediment can sometimes improve infiltration, excessive mining destroys natural water-holding capacity, leading to groundwater depletion.

Q8. A

What is Colony Collapse Disorder (CCD)?

- CCD is characterized by the sudden disappearance of worker bees from a hive, leaving behind the queen, brood (young bees), and stored food.
- This results in the eventual death of the colony, as there are not enough worker bees to maintain it.

Key Characteristics:

- Rapid loss of worker bees.
- Few to no dead bees found in or near the hive.
- Presence of the queen and brood.
- Remaining honey and pollen stores.

Factor in relation to Colony Collapse Disorder (CCD):

- **Pesticide exposure, especially neonicotinoids:** This is a significant contributing factor. Neonicotinoids are known to affect bee navigation and immune systems.
- **Loss of habitat and monoculture farming practices:** This is also a major contributor. Loss of diverse floral sources leads to nutritional stress, weakening bees.
- **Varroa mite infestations and viral infections:** These are known stressors that weaken bee colonies and make them more susceptible to CCD.
- **Replacing honey with high-fructose corn syrup:** This is considered a contributing factor. High fructose corn syrup is not as nutritionally complete as honey, and can lead to malnutrition.

While,

- **Increased genetic diversity among bee colonies:** This is incorrect. Increased genetic diversity would likely *strengthen* bee colonies, making them more resilient.

Q9. A

- **Statement I is correct:** Excessive artificial light at night disrupts the natural behaviors of migratory birds, leading to exhaustion from prolonged flights, disorientation, and increased mortality due to collisions with buildings or other structures.
- **Statement II is correct:** Migratory birds rely on natural cues like stars and the Earth's magnetic field for navigation. Artificial lights interfere with these cues, leading to disorientation, prolonged flights, and collisions.
- Statement II provides the **explanation** for Statement I. It explains how artificial lights disrupt navigation cues, which in turn leads to exhaustion and mortality.

Hence, both statements are correct, and Statement II explains Statement I. Therefore, option a is correct answer.

Q10. D

- EIA primarily deals with the **environmental consequences** of a project, such as impacts on ecosystems, biodiversity, water quality, air quality, and climate.
- SIA focuses on the **social and human impacts**, such as displacement of communities, changes in employment patterns, cultural heritage, and demographic shifts.
- **Option a is not correct:** Changes in local employment patterns are a **social impact** (SIA), and water quality is an **environmental impact** (EIA). This option reverses the roles of EIA and SIA.
- **Option b is not correct:** Cultural heritage preservation is a **social impact** (SIA), and greenhouse gas emissions are an **environmental impact** (EIA). This option also reverses the roles of EIA and SIA.
- **Option c is not correct:** Demographic shifts are a **social impact** (SIA), and habitat loss for endangered species is an **environmental impact** (EIA). This option reverses the roles of EIA and SIA.
- **Option d is correct:** Aquatic biodiversity is an **environmental impact** (EIA), and displacement of local communities is a **social impact** (SIA). This option correctly differentiates the roles of EIA and SIA.

Q11. A

- **Statement 1 is correct:** Both Inar (a Hittite deity) and Indra (a Vedic god) are associated with storms, warfare, and leadership. These similarities are part of the broader Indo-European mythological tradition, where deities often share common characteristics across cultures.
- **Statement 2 is not correct:** Suryyas and Maruttash are found in Kassite inscriptions, but the Kassites were from Mesopotamia (not Greece). While Suryyas may resemble Surya, Maruttash is more associated with Mesopotamian deities rather than the Vedic Marut.

Q12. C

- Panini mapped out the grammatical rules of Sanskrit as it existed in his time.
- His book became a landmark in the history of the Sanskrit language and literature, marking the transition from Vedic Sanskrit to classical Sanskrit.
- There must have been earlier Sanskrit grammarians, but by founding his own school of grammar and becoming a widely acknowledged authority on the subject, Panini surpassed and eclipsed them completely.
- Panini's grammar was handed down over the centuries from teachers to students, to a large extent through oral instruction
- Little is known about Panini's life.
- He was a Brahmana, and seems to have belonged to a place called Shalatura in Gandhara country in the north-west.

- The Chinese pilgrim Xuanzang visited Shalatura in the 7th century CE.
- He mentions a statue of Panini standing in the town, and tells us that its children pursued the study of grammar and held the great grammarian in high esteem.
- The 19th century archaeologist Alexander Cunningham suggested the identification of ancient Shalatura with Lahur, a town four miles north-west of Ohind, close to the confluence of the Kabul and Indus rivers.

Q13. A

- Vatsa or Vamsa, south of the Ganga, was noted for its fine cotton textiles.
- Its capital was Kaushambi, identified with Kosam village on the right bank of the Yamuna.
- Legends recount the rivalry between kings Udayana of Vatsa and Pradyota of Avanti, and refer to a love affair and marriage between Udayana and Vasavadatta, Pradyota's daughter.
- Udayana also seems to have entered into matrimonial alliances with the ruling families of Anga and Magadha.
- This king went on to become the romantic hero of three Sanskrit dramas of later times—the Svapna-Vasavadatta of Bhasa and the Ratnavali and Priyadarshika of Harsha.

Q14. A

- **Statement 1 is correct:** Tusaspa is mentioned as a **Persian (Yavana) official** appointed by **Ashoka** to govern the **western provinces** of the Mauryan Empire. This aligns with Ashoka's administrative system, which included foreign officers in key roles.
- **Statement 2 is not correct:** **Antiochus I (281–261 BCE) was NOT a contemporary of Ashoka.** Instead, **Antiochus II (261–246 BCE)**, the ruler of the Seleucid Empire, was Ashoka's **actual contemporary**. Ashoka's **Rock Edict II and XIII** mention diplomatic relations with Greek rulers, including **Antiochus II Theos**, not Antiochus I.

Q15. C

- **Statement 1 is correct:** **Maduraikkanji**, a Sangam-era text by **Mangudi Maruthanar**, describes the **prosperity of Madurai** and gives a **detailed account of South Indian trade with the Romans**, particularly mentioning ports, goods, and economic activities.
- **Statement 2 is correct:** The **Hathigumpha inscription of Kharavela** (in Odisha) mentions the **defeat of a Tamil confederacy**, believed to be linked to the **Sangam kingdoms** (such as the Cholas, Pandyas, or Cheras). This makes it one of the **few non-Tamil inscriptions** that refer to the Sangam kingdoms.

Q16. D

- **Statement I is incorrect:** The Marriage tax (also known as Jaziya or Kharaj) was indeed imposed on non-Muslim subjects (primarily Hindus) during the Delhi Sultanate. It was one of several taxes levied on non-Muslims, including agricultural taxes, trade taxes, and others. Therefore, the claim that the Marriage tax was "not imposed" is false.
- **Statement II is correct:** The Marriage tax (or similar taxes like Jizya) was imposed on non-Muslims as a discriminatory measure to incentivize conversion to Islam. By imposing financial burdens on non-Muslims, the Delhi Sultanate aimed to encourage them to convert to Islam, as Muslims were exempt from such taxes.

Therefore, option d is correct answer.

Q17. A

- In the context of **Delhi Sultanate Administration**, the term **Muqtis** refers to officials who were responsible for administering **iqta** (land grants) and collecting revenue from their assigned territories. They also maintained law and order and provided military support to the Sultan.
- The role most similar to that of the **Muqtis** is of **Iqtadars**
- **Iqtadars** were essentially the same as **Muqtis**. Both terms refer to officials who managed **iqta** (land grants) and performed similar administrative, revenue collection, and military duties.

While,

- **Maliks**: These were nobles or high-ranking officials, but they did not necessarily have the same administrative and revenue-collecting responsibilities as Muqtis.
- **Mamlatdars**: These were revenue officers in later periods (e.g., Mughal and British administrations), not during the Delhi Sultanate.
- **Munhias**: These were local village headmen or representatives, not comparable to the broader administrative role of Muqtis.

Q18. A

- **Statement 1 is correct**: Prataparudra II was the ruler of the Kakatiya dynasty, which held power in the Telugu-speaking region of what is now Andhra Pradesh and Telangana. In 1303, Ala-ud-din Khalji's forces attempted to invade the Kakatiya kingdom, but they were successfully repelled by Prataparudra II's army. It is important to understand that while Prataparudra II defeated the Khalji army in 1303, later on, the kakatiya kingdom did fall to the Delhi sultanate.
- **Statement 2 is not correct**: Firoz Tughluq's reign witnessed a heightened level of religious orthodoxy and a stricter implementation of Islamic law. This led to increased persecution of Shias and other groups deemed heretical. While sectarian tensions existed throughout the Delhi Sultanate, Firoz Tughluq's policies significantly aggravated the situation.

Q19. D

	<i>Terms</i>	<i>Meanings</i>
1	Khums	State's share of war booty, treasure troves, mines, etc
2	Khutba	sermon delivered during the Friday congregational prayer
3	Alim	Muslim theologian or scholar
4	Shirb	Irrigation tax

Q20. D

Nimbraka

- He was younger contemporary of Ramanujam who propounded the Dvaita advaita philosophy and the philosophy of Bheda Abheda (difference/ non-difference).
- According to him, Brahman or the supreme soul transforms itself into the souls of the world, which are therefore real, distinct, and different from Brahman.
- Like Vishista Advaita, the Bheda Abheda school also believes that the world and Brahman are both equally real, and that the world is a part of Brahman.
- The difference is on emphasis only.
- The same analogy of sea and wave, clay and pot, etc. is used here.

- A particular analogy of Bhed Abheda is the sun and the sun beam.
- The sun beam cannot be called separate from the sun, it arises from the sun, and is attached to it. Yet it is not the sun either, it is only a part of the sun, a reflection of the sun, and it gives only a part view of the sun. Hence the world also is but a manifestation of Brahman, but it is a very small manifestation, and the difference with Brahman is very large.
- He was the preacher of Vaishnavite Bhakti in the Telangana region.
- He was also the worshipper of Krishna and Radha and established his ashrama in Braja (Mathura).
- He also founded the Sanak Sampradaya.

Q21. C

- **Statement I is correct:** The **Bank of England** provided financial backing for British wars in India, supported the **East India Company**, and later played a role in maintaining colonial administration. It **funded British military campaigns**, such as the **Anglo-Mysore Wars** and **Anglo-Maratha Wars**, which secured British dominance.
- **Statement II is incorrect:** While British authorities **did introduce a centralized monetary system in India**, the **Bank of England itself did not directly issue currency in India**. Instead, the **East India Company and later the British Indian government controlled the currency** (e.g., the introduction of the **Rupee Act of 1835**). The Bank of England, however, influenced policies by funding the empire.

Hence option c is the correct answer.

Q22. A

- **Statement 1 is correct:** The Portuguese transferred Bombay (now Mumbai) to the British Crown as part of the dowry of Catherine of Braganza when she married King Charles II of England in 1661. This was formalized through the Treaty of Lisbon (1661).
- **Statement 2 is not correct:** Salsette, Bassein, Mazagaon, Parel, Worli, Sion, Dharavi, and Wadala still remained under Portuguese possession. From 1665 to 1666, the English managed to acquire Mahim, Sion, Dharavi, and Wadala.
- **Statement 3 is not correct:** Even after the treaty, **Britain and Portugal had conflicts in India**, particularly over Portuguese-controlled **Goa, Daman, and Diu**. The Portuguese continued to resist British expansion. Even though the relation in Europe has improved, but at Indian Subcontinent sometimes local interests led to conflict among both the powers.

Q23. B

- **Statement 1 is not correct:** The **Dadaji Bhikaji vs. Rukhmabai case (1884)** was **not related to widow remarriage**. It was about a woman's right to refuse conjugal obligations in a child marriage. Widow remarriage was addressed earlier through the **Hindu Widows' Remarriage Act, 1856**, championed by **Ishwar Chandra Vidyasagar**.
- **Statement 2 is correct:** **Raja Nand Kumar vs. Warren Hastings (1775)** is widely considered the **first case of judicial murder** in British India. Nand Kumar, who accused Hastings of corruption, was **convicted of forgery** under an outdated British law and executed, seen as **revenge by Hastings**.

Q24. C

Pandita Ramabai:

Pandita Ramabai (1858–1922) is celebrated as one of India's most influential social reformers, women's rights activists, and educationists. Her groundbreaking work in the fields of women's education and social reform left an enduring legacy.

Early Life and Education

- **Birth:** Born as Rama Dongre on April 23, 1858, in Canara District (present-day Karnataka), into a Brahmin family.
- **Family Influence:** Her father, Anant Shastri Dongre, a Sanskrit scholar, defied societal norms by educating Ramabai and her mother in Sanskrit and classical texts.
- **Orphaned Young:** The famine of 1877 claimed the lives of her parents and siblings, leaving Ramabai to travel extensively with her brother. This exposure broadened her worldview.
- **Sanskrit Proficiency:** By age 12, Ramabai was proficient in Sanskrit. Her exceptional scholarship earned her the titles "Pandita" (scholar) and "Sarasvati" from Calcutta University.

Contributions to Women's Education

Ramabai believed education was central to women's empowerment. She established institutions that provided academic and vocational training to women, particularly widows.

Key Initiatives

1. **Arya Mahila Samaj (1882):**
 - Founded in Pune to promote women's education and oppose regressive practices like child marriage.
 - Encouraged women to engage in public life and seek independence.
2. **Sharada Sadan (1889):**
 - A residential school for child widows offering academic education and vocational training.
 - Helped women achieve economic independence.
3. **Advocacy for Medical Education:**
 - Testified before the English Education Commission in 1882, advocating for Indian women's access to medical education.
 - This led to the establishment of Lady Dufferin College for women's medical training.

Social Reforms

Pandita Ramabai worked tirelessly to address social injustices faced by women and marginalized communities.

- **Mukti Mission (1897):**
 - Established near Pune to provide refuge for widows, orphans, and socially ostracized individuals.
 - Focused on vocational training and self-sufficiency for its residents.
- **Critique of Patriarchy:**
 - Used her knowledge of Sanskrit scriptures to challenge patriarchal norms and advocate for gender equality.

Q25. B

- **Statement I is correct:** The British, as absentee rulers, were primarily focused on **extracting resources and maintaining control rather than addressing local needs**. Their detachment from ground realities created **resentment among Indian rulers, peasants, and soldiers**, fueling the **Revolt of 1857**.
- **Statement II is correct:** The British did introduce **administrative and legal reforms**, such as:
 - **Codification of laws (e.g., Indian Penal Code, 1860)**
 - **Introduction of the civil service system**
 - **Development of infrastructure like railways and telegraph lines**
- However, these reforms were **not aimed at Indian welfare** but rather at **strengthening British control and facilitating economic exploitation**. Thus, while statement II is factually correct, it does **not directly explain the cause of the 1857 Revolt**, making **b the correct choice**.

Q26. B

The Goods and Services Tax (GST) regime in India subsumed several central and state taxes to simplify the taxation process. Below is a comprehensive list of the taxes that were integrated into the GST framework:

Central Taxes Subsumed Under GST

- **Service Tax:** Previously levied on services provided.
- **Central Excise Duty:** Applied on the manufacture of goods, except for certain products like petroleum.
- **Additional Excise Duties:** Imposed on specific goods such as textiles.
- **Additional Customs Duty (Countervailing Duty - CVD):** Levied on imports to equalize local taxes.
- **Special Additional Duty of Customs (SAD):** Another import duty aimed at countering domestic taxes.
- **Central Sales Tax (CST):** Applied to inter-state sales of goods.
- **Surcharges:** Additional charges imposed by the central government.
- **Central CESS:** Various cesses related to goods and services.

State Taxes Subsumed Under GST

- **Value Added Tax (VAT):** Levied on the sale of goods within a state.
- **Sales Tax:** Previously charged on sales transactions.
- **Entertainment Tax:** Excluding those levied by local bodies, applied to entertainment events.
- **Luxury Tax:** Imposed on luxury goods and services.
- **Entry Tax:** Charged on goods entering a state.
- **Taxes on Lotteries, Betting, and Gambling:** Unified under GST for consistent taxation across states.
- **State CESS and Surcharges:** Various state-specific cesses related to the supply of goods and services.
- **Octroi:** A local tax levied on goods entering a municipal area.

Taxes Outside the GST Regime

- **Alcohol for Human Consumption:** Sales tax or VAT continues to be levied on alcoholic beverages.
- **Petroleum Products:** This includes:
 - Crude oil
 - Motor spirit (petrol)

- High-speed diesel (HSD)
- Aviation turbine fuel (ATF)
- Natural gas
- **Tobacco Products:** Cigarettes and other tobacco-related items are taxed separately.
- **Stamp Duty:** Applicable on property transactions, this tax remains outside the GST.
- **Electricity Duty:** Taxes levied on electricity consumption are not included in GST.
- **Vehicle Tax:** Taxes on vehicles, including registration fees, are also outside the GST.
- **Property Tax:** Local property taxes imposed by municipal authorities are not covered under GST.

Q27. D

- **Statement I is incorrect:** Pigovian taxes are designed to address negative externalities (e.g., pollution, environmental damage) by imposing taxes on activities that cause harm to society. While they can improve social welfare by correcting market failures, they are not specifically aimed at reducing economic inequality.
- **Statement II is correct:** Pigovian taxes do target industries and individuals responsible for negative externalities, often affecting wealthier sections of society who are more likely to engage in such activities (e.g., industrial production, excessive consumption). By internalizing the costs of environmental and social damages, these taxes can indirectly benefit lower-income groups, who often bear the brunt of such externalities.

Hence option d is correct answer.

Q28. A

- **Statement a is correct:** The **Laffer Curve** suggests that at very high tax rates, individuals and businesses have **strong incentives to reduce taxable income** through **legal loopholes, offshore tax havens, underreporting, or even relocating** to lower-tax regions. Since **GDP and economic activity remain stable**, the drop in tax revenue is **not** due to an economic downturn but due to behavioural responses to taxation. Countries with **high top marginal tax rates** (e.g., Sweden in the 1970s, France's "super-tax" in 2012) have observed **similar revenue declines due to tax migration and avoidance**.
- **Statement b is not correct:** There is **no evidence of a recession**, GDP remains stable. The Laffer Curve effect is more about **taxpayer behaviour** than economic downturns.
- **Statement c is not correct:** Inflation could affect real tax revenue, but that would impact all tax brackets, **not just high-income earners**.
- **Statement d is not correct:** While tax collection inefficiency can reduce revenue, it **wouldn't be tied specifically to a high tax rate on the wealth**, the pattern aligns more with a **Laffer Curve effect**.

Q29. A

- **Statement 1 is correct:** Commercial Paper (CP) is indeed an unsecured, short-term debt instrument issued by corporations to meet their immediate funding needs. It is typically issued in the form of a promissory note and has a maturity period of up to 270 days.
- **Statement 2 is not correct:** Certificates of Deposit (CDs) are issued by banks with a fixed maturity, but they are not considered risk-free. While they are generally low-risk instruments, they are not as safe as government securities, which are backed by the government. Additionally, CDs do not necessarily ensure

higher returns compared to government securities. The returns on CDs depend on market conditions and the issuing bank's creditworthiness.

Q30. B

- **Statement a is not correct:** Strong economic growth can lead to **moderate** increases in bond yields due to inflation expectations, but a **steep rise coupled with volatility** suggests **financial instability, not just growth**.
- **Statement b is correct:** **Bond yields rise when bond prices fall**, often due to **higher inflation expectations, fiscal instability, or concerns about rising debt levels**. If yields are **rising sharply and stock markets are volatile**, it suggests **investor uncertainty** about the economy's future. The central bank's potential rate hike further **reinforces fears of inflation control measures**, which can impact both bond and equity markets.
- **Statement c is not correct:** Interest rate hikes **do influence bond yields**, but the broader **market uncertainty and fiscal concerns** are more pressing factors here. (although partially correct, but not accurate explanation)
- **Statement d is not correct:** FDI inflows **usually** strengthen investor confidence, leading to **stable or falling bond yields**, not rising ones.

Q31. C

- **Statement a is not correct:** The **final prospectus**, not the RHP, contains the **definitive issue price, share count, and allocation details**.
- **Statement b is not correct:** While an RHP is **mandatory**, its **filing does not mean automatic regulatory approval**—authorities can seek modifications or even reject the IPO proposal.
- **Statement c is correct:** A **Red Herring Prospectus (RHP)** is a **preliminary disclosure document** issued by a company **before** an IPO. It provides **essential information about the business, risk factors, financial performance, and intended use of IPO proceeds**. However, it **does not include the final issue price or confirm that the IPO will definitely happen**—companies can still withdraw or revise the offering based on market conditions.
- **Statement d is not correct:** While the RHP includes **risk factors**, it is not primarily an **anti-fraud guide**; it is a **corporate disclosure document for investor awareness**.

Q32. D

- **Statement a is not correct:** IDRs are issued by **foreign companies in India**, not Indian companies in global markets. ADRs are issued by **Indian companies in the U.S.**, not by U.S. companies in India.
- **Statement b is not correct:** Voting rights for **both IDR and ADR holders depend on the specific issuance terms**—some ADRs allow voting, some don't, and the same applies to IDRs.
- **Statement c is not correct:** **IDRs are denominated in Indian Rupees (INR)** while **ADRs are in U.S. Dollars (USD)**—so currency fluctuations **do impact returns** for investors.
- **Statement d is correct:** **IDRs (Indian Depository Receipts)** are issued by **foreign companies in India** and are subject to **SEBI regulations**. **ADRs (American Depository Receipts)** are issued by **Indian companies in the U.S.** and are subject to **SEC (Securities and Exchange Commission) regulations**. IDRs are listed on **Indian stock exchanges**, while ADRs are traded on **U.S. stock exchanges (NYSE, NASDAQ, etc.)**.

Q33. B

In India, **Alternative Investment Funds (AIFs)** are defined under the Securities and Exchange Board of India (SEBI) regulations as privately pooled investment vehicles that collect funds from sophisticated investors and invest in accordance with a defined investment policy. AIFs are categorized into three broad categories:

1. **Category I AIFs:** These include funds that invest in startups, early-stage ventures, social ventures, SMEs, infrastructure, and other sectors considered economically desirable by the government or regulators. Examples include Venture Capital Funds and Angel Funds.
2. **Category II AIFs:** These include funds that do not fall under Category I or III and do not undertake leverage or borrowing other than to meet day-to-day operational requirements. Examples include Private Equity Funds, Debt Funds, and Fund of Funds.
3. **Category III AIFs:** These include funds that employ diverse or complex trading strategies and may use leverage, including hedge funds and other funds that trade with a view to making short-term returns.

Hence, for given funds:

1. **Venture Capital Funds:** Classified as **Category I AIF**.
2. **Angel Funds:** Classified as **Category I AIF**.
3. **Mutual Funds:** These are **not AIFs**. Mutual Funds are regulated separately under SEBI (Mutual Funds) Regulations and are not considered alternative investments.
4. **Debt Funds:** These can be classified as **Category II AIFs** if they are structured as private debt funds. However, debt-oriented mutual funds are not AIFs.
5. **Real Estate Investment Trusts (REITs):** These are **not AIFs**. REITs are regulated separately under SEBI (REITs) Regulations.
6. **Funds of Funds:** These can be classified as **Category II AIFs** if they invest in other AIFs.

Q34. B

- **Statement a is not correct:** Price support schemes distort market prices and typically fall under the **Amber Box**, which is subject to WTO restrictions.
- **Statement b is correct:** The “**Blue Box**” of WTO refers to **permissible subsidies** that are **linked to production-limiting programs** to avoid excessive market distortions. **Such subsidies are exempt from reduction commitments under WTO agreements**, making them an attractive option for governments supporting farmers while adhering to WTO rules.
- **Statement c is not correct:** **Input subsidies** like fertilizers and seeds **increase production incentives** and fall under the **Amber Box**, leading to trade distortions.
- **Statement d is not correct:** **Income support payments unrelated to production** typically fall under the **Green Box**, which covers non-trade-distorting subsidies.

Q35. D

Critical Minerals:

- Government has released a list of 30 critical minerals for India.
- These minerals are **Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.**

- Ministry of Mines has increased focus on exploration of these minerals in the country through Geological Survey of India (GSI) and other agencies.
- A joint venture company namely Khanij Bidesh India Ltd. (KABIL) has been incorporated with the equity contribution from three Central Public Sector Enterprises namely, National Aluminium Company Ltd, Hindustan Copper Ltd and Mineral Exploration Company Ltd with the objective to identify and acquire overseas mineral assets of critical & strategic nature such as Lithium, Cobalt & others so as to ensure supply side assurance.
- KABIL has engagements with countries like Argentina, Australia etc. to acquire critical & strategic minerals assets.

Q36. D

- **Article 51A(a) of the Indian Constitution** (Fundamental Duties) states that **it is the duty of every citizen of India "to abide by the Constitution and respect its ideals and institutions, the National Flag, and the National Anthem."**
- If a **state or Union government mandates the singing of the National Anthem in schools**, it aligns with this constitutional duty.

Q37. D

- **Statement 1 is not correct:** Under **Article 368** of the Indian Constitution, amending provisions related to the "Quorum in Parliament" does **not** require a Special Majority of Parliament. The quorum requirements are part of the procedural rules of Parliament and are governed by **Article 100**, which can be amended by a simple majority of Parliament.
- **Statement 2 is not correct:** While **most constitutional amendments in India are passed only by Parliament**, some amendments **require ratification by at least half of the state legislatures** before becoming law.

Q38. A

- **Statement I is correct:** Before 1978, **Right to Property (Article 31)** was a **Fundamental Right** under **Part III of the Indian Constitution**. The **44th Constitutional Amendment Act, 1978**, removed **Article 31**, making **Right to Property a legal right under Article 300A** instead of a **Fundamental Right**.
- **Statement II is correct:** The Supreme Court has ruled in multiple cases (e.g., **Kesavananda Bharati case, 1973**) that **Right to Property is not part of the Basic Structure** of the Constitution. This means Parliament **can amend or regulate** property rights without violating the Basic Structure doctrine.
- Since **Right to Property was not a part of the Basic Structure**, Parliament had the power to **remove it through the 44th Amendment** without violating constitutional principles.

Hence both the statements are correct, and statement II correctly explains statement I. Hence option a is correct.

Q39. C

- **Statement I is correct:** **Article 1 of the Indian Constitution** refers to India as a "**Union of States**", not a "**Federation of States**." Dr. B.R. Ambedkar emphasized this terminology to indicate that:
 - **Indian states did not come together through an agreement** like in the U.S. federal model.
 - **States have no right to secede** from the Union.

- **Statement II is incorrect: Indian states are not mere administrative units; they have constitutional status and powers** under the **Seventh Schedule** (Union, State, and Concurrent Lists). The Indian Constitution **grants autonomy** to states in certain matters, making India a **quasi-federal** system rather than a purely unitary one. While the Centre has **strong powers** (e.g., **Article 356 - President's Rule**), states are not just administrative divisions but **sovereign within their assigned spheres**.

Hence option c is correct answer.

Q40. A

Meaning of Extraterritorial Legislation:

- **Article 245(2) of the Indian Constitution** states that **Parliament has the power to make laws with extraterritorial operation**, meaning such laws can apply **beyond India's territory**.
- This applies to:
 - **Indian citizens living abroad**
 - **Indian companies and entities operating outside India**
 - **Any matter affecting India's sovereignty and interests**
- Laws such as the **Indian Penal Code (IPC)**, **Foreign Exchange Management Act (FEMA)**, and **Unlawful Activities Prevention Act (UAPA)** have provisions applying to Indians abroad.
- The **Supreme Court has upheld** that laws made by Parliament **with extraterritorial application are valid**, provided they have a **real and substantial connection to India**.

Q41. C

- **Statement I is correct: Definition of 'Agricultural Income'** is given under **Section 10(1) of the Income Tax Act, 1961** and is exempt from Union taxation under **Entry 82 of the Union List (Seventh Schedule)**. However, the **Union Executive (i.e., the Government) cannot unilaterally alter this definition** without **Parliament's approval**, as taxation matters require **legislative amendments** through the **Parliamentary process**. Even though Parliament cannot impose taxes on agricultural income, any modification of its definition would **require legislative sanction**.
- **Statement II is incorrect:** Agricultural income is not a major source of state revenue. While State Governments have the power to tax agricultural income under Entry 46 of the State List, in practice, most states do not levy such a tax, as it is politically sensitive. Instead, state revenue primarily comes from GST, Excise Duty on Alcohol, Stamp Duty, and Land Revenue, rather than direct taxation of agricultural income. Very few states (such as Assam and Kerala) have imposed taxes on agricultural income.

Hence option c is correct answer.

Q42. D

- **Statement 1 is not correct:** While **Article 302** of the Indian Constitution empowers Parliament to impose restrictions on the freedom of trade, commerce, and intercourse between states in the public interest, **Article 304** allows state legislatures to impose reasonable restrictions on the freedom of trade and commerce within the state, provided such restrictions are in the public interest and receive the prior approval of the President. Therefore, it is not only Parliament but also state legislatures (with certain conditions) that can impose such restrictions.

- **Statement 2 is not correct:** Article 301 guarantees freedom of trade, commerce, and intercourse throughout the territory of India, ensuring no arbitrary restrictions between states. It does NOT give power to the Centre or States to monopolize or nationalize businesses. Monopolization or nationalization of businesses (such as coal, banking, or telecom) is done through separate legislative acts, not under Article 301. If the government wants to restrict free trade for monopoly purposes, it must rely on Article 302 (Parliament's power) or Article 304 (State's power with Presidential assent).

Q43. B

Statement 1 is not correct: The second proclamation of National Emergency in India was not due to the 1965 war with Pakistan. Three National Emergencies have been declared in India:

1. 1962 – Due to the Indo-China war.
2. 1971 – Due to the Indo-Pak war (this was the actual second proclamation).
3. 1975 – Due to internal disturbances, declared by Indira Gandhi.

The 1965 Indo-Pak war did not lead to a separate National Emergency—the one from 1962 (Indo-China war) was already in force and continued until 1968.

Statement 2 is correct: In the *Minerva Mills case* (1980), the Supreme Court ruled that the proclamation of National Emergency is subject to judicial review and cannot be beyond the purview of the courts. The court emphasized that judicial review is a fundamental part of the Basic Structure of the Constitution, and even during an Emergency, the government's actions are not completely immune from judicial scrutiny.

Q44. D

- **Statement 1 is not correct:** While the President of India is the head of state and the Supreme Commander of the Armed Forces, their office is not directly derived from the British Viceroy. The Viceroy was a representative of the British Crown, whereas the Indian President is an elected constitutional head. India's presidential system is influenced more by the British parliamentary model than by the Viceroy's role.
- **Statement 2 is not correct:** V.V. Giri was NOT elected unopposed; he faced a contest in the 1969 Presidential election against Neelam Sanjiva Reddy. N. Sanjeeva Reddy (1977) was the only President elected unopposed in India's history.
- **Statement 3 is not correct:** The President of India can only be impeached for 'Violation of the Constitution' under Article 61. Unlike in the U.S. Constitution, where a President can be impeached for "high crimes and misdemeanours," there is no mention of "misdemeanours" in the Indian Constitution as grounds for impeachment.

Q45. C

- **Option a is not correct:** It seems correct at first glance because the Planning Commission was under the PM, but it was more of an advisory body than a sign of centralized authority.
- **Option b is not correct:** It is misleading because while coalition politics did reduce PM dominance for a time, the statement contradicts the transformation into 'inter stellas luna minores.'
- **Option c is correct:** The rise of the PMO and concentration of power within the Prime Minister's leadership (especially under strong PMs like Indira Gandhi and Narendra Modi) reflects the shift from a 'first among equals' to an unquestioned central authority.
- **Option d is not correct:** It creates confusion by referring to President's Rule, but the President acts on the aid and advice of the Cabinet, limiting its direct impact on PM authority.

Q46. C

	<i>Type of volcanoes</i>	<i>Examples</i>
1	Shield volcano	Galápagos Islands Volcanoes, Mauna Kea, Kīlauea,
2	Stratovolcano	Mount Merapi, Mount St. Helens, Mount Etna, Mount Merapi, Mount Rainier
3	Caldera volcano	Mount Mazama
4	Flood basalt province	Emeishan Traps

Q47. C

- **Statement a is correct:** The Great African Rift Valley is caused by the **divergence** of the Somali and Nubian plates, which are part of the African Plate. This is an ongoing process, eventually leading to the formation of a new ocean.
- **Statement b is correct:** The rift is geologically active, with frequent earthquakes and volcanism (e.g., Mount Kilimanjaro, Mount Nyiragongo). It also contains deep lakes like **Lake Tanganyika** and **Lake Malawi**.
- **Statement c is not correct:** The Red Sea is indeed an extension of the rift, but the **southernmost extent** of the rift **does not** reach the Zambezi River. Instead, it extends into **Mozambique** near the East African coastline.
- **Statement d is correct:** Scientists predict that the continued divergence will eventually lead to the **formation of a new ocean**, splitting East Africa from the rest of the continent.

Q48. B

Epeirogeny:

- Epeirogeny refers to broad, gentle, vertical movements of Earth's crust without significant folding, faulting, or volcanic activity. It can cause:
- Gradual uplift or subsidence of large continental areas
- Presence of marine fossils at high elevations (indicating past submersion followed by uplift)
- No volcanic or tectonic deformation

Examples:

- **Scandinavian Shield & Hudson Bay Region (Canada):** These regions were heavily glaciated during the Ice Age. After the glaciers melted, the crust **rebounded upward** over thousands of years.
- **Colorado Plateau (USA):** This region was uplifted **without major folding or faulting**, primarily due to **mantle dynamics and isostatic balance**.

Q49. D

	<i>Landforms</i>	<i>Geomorphic agents</i>
1	Kettle Holes	Glaciers
2	Ventifacts	Winds
3	Helictites	Underground water
4	Tomboles	Sea waves

Q50. D

- **Statement I is incorrect:** While the sky's blue colour can influence the appearance of the sea, the primary reason the sea appears blue is due to the absorption and scattering of light by water molecules, not merely because it reflects the sky's colour.
- **Statement II is correct:** Water molecules absorb longer wavelengths of light (such as red, orange, and yellow) more efficiently than shorter wavelengths (like blue). As a result, blue light is scattered and dominates our perception, making the sea appear blue.

Hence d is the correct answer.

Q51. D

- **Statement I is incorrect:** While anthracite coal is predominantly found in the Himalayan foothills (e.g., Jammu & Kashmir), it is **not true that other coal-bearing regions of India contain only lower-grade coal.** Some semi-anthracite coal deposits have been reported in regions like Meghalaya, and high-grade bituminous coal is found in Jharkhand, Odisha, and Chhattisgarh.
- **Statement II is correct:** Anthracite coal forms under **high temperature and pressure**, which occurs in regions undergoing **active tectonic compression and metamorphism**, such as the **Himalayan orogeny**. In contrast, the **Gondwana coalfields** of central and eastern India formed in **stable, sedimentary basins**, which do not provide the extreme conditions required for anthracite formation.

Hence option d is correct answer.

Q52. A

The mountain passes in a West to East direction:

1. **Pir Panjal Pass** – Located in **Jammu & Kashmir**, part of the **Pir Panjal range**.
2. **Aghil Pass** – Located in the **Karakoram range**, connecting Ladakh to China.
3. **Shipki La Pass** – Located in **Himachal Pradesh**, linking India and Tibet.
4. **Mana Pass** – Located in **Uttarakhand**, near the **India-Tibet border**.
5. **Lipu Lekh Pass** – Located in **Uttarakhand**, connecting **India and Tibet**, further east of Mana Pass.

Correct Order (West to East): Pir Panjal Pass → Aghil Pass → Shipki La Pass → Mana Pass → Lipu Lekh Pass



Q53. B

- **Statement I is correct:** Marine fossils such as ammonites, corals, and mollusks have been found in the **Jaisalmer Basin**, indicating its past submergence under the Tethys Sea.
- **Statement II is correct:** The **collision between the Indian and Eurasian plates** led to the upliftment of the Himalayan region and the gradual retreat of the Tethys Sea.
- However, **Statement II does not fully explain Statement I**, because while plate tectonics led to the retreat of the Tethys Sea, the **specific reason marine fossils are preserved in Jaisalmer is due to sedimentary deposition during the Mesozoic era**, not just the upliftment of the Indian subcontinent.

Hence both the statements are correct, and statement II does not explain statement I. Hence option b is correct answer.

Q54. D

- **Statement 1 is not correct:** The **Subarnarekha River** does not follow a **centripetal drainage pattern** (where rivers flow toward a central lowland, such as an inland basin). Instead, it follows a **dendritic drainage pattern**, draining into the Bay of Bengal.
- **Statement 2 is not correct:** The **Luni River** does not cut the **Tropic of Cancer twice**. The river originates in Rajasthan near Ajmer and flows into the Rann of Kutch, but it **does not cross the Tropic of Cancer twice**. The **Mahi River** is the **only river in India that crosses the Tropic of Cancer twice** (in Madhya Pradesh and Rajasthan).
- **Statement 3 is not correct:** The **Zaskar River** is a **consequent** (not obsequent) tributary of the **Indus River**. A **consequent tributary** follows the original slope of the land, while an **obsequent tributary** flows in the opposite direction to the original slope. Shyok River is an obsequent tributary of Indus River.

Q55. D

	Waterfalls	Rivers	States
1	Rajrappa Falls	Bhairavi River	Jharkhand
2	Hogenakkal Falls	Kaveri River	Tamil Nadu
3	Chitrakoot Falls	Indravati River	Chhattisgarh

Q56. A

	Specialised Farming	Descriptions
1	Olericulture	Growing of vegetables
2	Pomology	Growing of fruit and nut trees
3	Permaculture	Sustainable and self-sufficient agricultural
4	Arthropodiculture	Cultivation of insects

Q57. A

	Industrial centres	Industries	Countries
1	Stuttgart	Automobile	Germany
2	Lagos	Oil and gas/Finance	Nigeria
3	São Paulo	textiles	Brazil

Q58. C

	<i>Straits</i>	<i>Connecting oceans/seas</i>
1	Lombok Strait	Java Sea & Indian Ocean
2	Oresund Strait	Baltic Sea & North Sea
3	Beagle Channel	Atlantic Ocean & Pacific Ocean
4	Bass Strait	Tasman Sea & Indian Ocean

Q59. D

	<i>Tribes</i>	<i>Countries</i>
1	Navajo	USA
2	Quechua	Peru, Bolivia, Ecuador, Argentina, Chile
3	Dayak	Indonesia, Malaysia, Brunei
4	Berber	Morocco, Algeria

Q60. B

Urban Sprawling Phenomena

Urban sprawl refers to the uncontrolled and uncoordinated expansion of urban areas into surrounding rural or undeveloped land. This phenomenon is characterized by low-density residential housing, single-use zoning, and increased reliance on automobiles for transportation. Urban sprawl has significant social, economic, and environmental implications that affect both urban and rural environments.

Characteristics of Urban Sprawl

- **Low-Density Development:** Urban sprawl typically features low-density housing developments that spread out over large areas.
- **Single-Use Zoning:** Areas are often designated for specific uses (e.g., residential, commercial), leading to a lack of mixed-use developments.
- **Dependence on Automobiles:** Residents rely heavily on cars for transportation due to the distance between homes, workplaces, and amenities.
- **Fragmentation of Natural Areas:** The expansion often encroaches on natural habitats, leading to habitat destruction and fragmentation.

Causes of Urban Sprawl

Several interconnected factors contribute to the phenomenon of urban sprawl:

1. **Population Growth:** Rapid urban population growth drives the need for housing and infrastructure, pushing cities to expand into surrounding areas.
2. **Economic Opportunities:** The search for better job prospects and living standards attracts people from rural areas to urban centers.

3. **Cheaper Land Prices:** Suburban and rural land is often more affordable than urban property, encouraging families to move outward for larger living spaces.
4. **Inadequate Urban Planning:** Poorly coordinated urban planning leads to unregulated growth and development without consideration for long-term sustainability.
5. **Infrastructure Development:** The construction of highways and transportation networks facilitates access to previously undeveloped areas, promoting further expansion.
6. **Consumer Preferences:** Many individuals prefer the lifestyle associated with suburban living, including larger homes and perceived safety.

Q61. C

- **Statement 1 is correct:** The Bengal school of architecture was characterised by its use of bricks and black marble. The mosques built during this period continued the use of sloping ‘Bangla roofs’, which was previously used for temples. The **Bengal school of architecture** is known for its extensive use of **bricks** due to the scarcity of stone in the region.
- **Statement 2 is correct:** The Jaunpur School of architecture is famous for its lofty propylons (massive gateways) and decoration with floral and creeper motifs. This style is particularly seen in mosques like the Atala Masjid and Jama Masjid in Jaunpur.
- **Statement 3 is not correct:** The Malwa School of architecture is characterized by huge domes, arched gateways, and intricate carvings, but it is not particularly known for huge minarets or congested structures. Instead, it emphasizes spaciousness and symmetry, as seen in structures like the Jahaz Mahal and Hoshang Shah’s Tomb, and also minars were largely absent from Malwa school architecture.

Q62. A

There are numerous references to art of painting in the Brahmanical and Buddhist literature, for example, the representation of the myths and lore on textiles is known as Lepya Chitra. References to the art of Lekhya Chitra can also be seen, which has line drawings and sketches. Other types are Dhuli Chitra, Pata Chitra, etc. The play, Mudrarakshasa by Vishakhadutta, also facilitated the reader by mentioning the name of various paintings or patas, which are important to understand the different style of paintings and to observe all the principles of paintings. Some of the styles were:

- *Cauka Pitaka:* Refers to isolated framed drawings.
- *Dighala Pitaka:* Refers to long scrolls of paintings.
- *Yama Pitaka:* Refers to isolated paintings.

Q63. A

	<i>Jatakas</i>	<i>Stories</i>
1	Daddabha Jataka	The Foolish, Timid Rabbit
2	Javasakuna Jataka	The Lion and the Woodpecker
3	Munika-Jataka	The Ox who envied the Pig
4	Shibi-Jataka	King Shibi

Q64. D

Banni Embroidery:

- Banni embroidery, also known as *Heer Bharat*, is a traditional and intricate embroidery style originating from the Banni region of Kutch, Gujarat. Renowned for its vibrant colors, mirror work, and geometric patterns, this embroidery form reflects the rich cultural heritage of the region and has gained global recognition.

Key Features of Banni Embroidery

1. Origin:

- Practiced primarily by the Lohana community in Gujarat.
- Influenced by Sindhi embroidery traditions due to historical ties with Sindh.

2. Materials Used:

- *Heer* (silk floss) threads are used to create intricate designs.
- Mirrors (*shisha*) are extensively incorporated to add sparkle and depth to the patterns.

3. Design Patterns:

- Inspired by architectural motifs and geometric shapes.
- Common designs include floral patterns, symmetrical layouts, and vibrant color palettes.

4. Cultural Significance:

- Traditionally used to adorn garments, accessories, and household items like cushion covers and wall hangings.
- Often created by women as part of their dowries or for festive occasions.

Historical and Regional Context

- The Banni region of Kutch is home to diverse communities, including Lohanas, Jaths, and Mutwas, who have contributed to the evolution of this embroidery style.
- The embroidery reflects a blend of local traditions and influences from neighboring regions like Sindh (now in Pakistan).

Global Recognition

Banni embroidery has earned a unique place in the global textile industry due to its dazzling craftsmanship. It is now widely used in modern fashion, home décor, and accessories, helping preserve this centuries-old art form.

Q65. D

- **Statement 1 is correct:** The science of music called the Gandharva Veda is an Upaveda of the Sama Veda. The parts of the instrument Veena are mentioned in Aitareya Aranyaka. The Jaiminiya Brahmana speaks collectively of dance and music.
- **Statement 2 is correct:** *Swaramela-Kalanidhi*, written by *Ramamatya* in the 16th century, is an important text in **South Indian musicology**. It describes the **raga system, musical scales, and technical aspects of Carnatic music**.
- **Statement 3 is correct:** *Chaturdandi-prakashika*, written by *Venkatamakhin* in the 17th century, is a **key text on Carnatic musicology**. It introduced the **Melakarta system**, which forms the basis of modern **Carnatic raga classification**.

Q66. A

Context: Chief Economic Adviser (CEA) V. Anantha Nageswaran has cautioned against the financialisation of capital markets, where financial market dominance could distort macroeconomic outcomes.

What is Financialisation?

- It occurs when financial markets, financial motives, and financial institutions start to dominate economic activities, overshadowing real economic activities like production and investment.

Drawbacks of excessive capitalisation:

- **Increased vulnerability to economic shocks and market volatility:** Excessive financialization often leads to a **bubble-driven economy**, where financial markets become **disconnected from real economic fundamentals**. This makes the economy **highly volatile** and **prone to crises**, such as the 2008 Global Financial Crisis.
- **Diversion of investments from productive sectors like manufacturing to speculative activities:** When financial markets dominate, capital tends to move toward **quick-profit speculative ventures** like stock trading and derivatives instead of **long-term investments in industries** that drive sustainable economic growth.

While,

- **Higher employment generation in traditional industries due to greater capital availability:** Financialization **does not necessarily lead to increased employment** in traditional sectors. In fact, it can have the opposite effect, as more capital is directed toward **financial instruments rather than real-world industries**, which may slow down job creation in manufacturing and infrastructure.
- **Reduced economic inequality as financialization ensures broader wealth distribution:** Financialization often **worsens economic inequality** because the financial sector primarily benefits **institutional investors, banks, and high-net-worth individuals**, while **lower-income groups have limited access** to financial markets.

Q67. A

Context: Stock exchanges have decided to delay the implementation of T+0 (same-day) settlement cycle for institutional clients, which was set to start on September 30, 2024, on a voluntary basis. T+0 was introduced for retail clients in 25 securities as a beta version in March 2024.

T+0 and T+1 Settlement Cycles:

- **T+0 Settlement:** Refers to same-day settlement of trades where both funds and securities are exchanged on the same day.
- **T+1 Settlement:** In this system, trades are settled one business day after the transaction date. It was introduced in 2021 and has already been implemented in phases.

Economies having T+0 settlement cycles:

As of March 24, 2025, among the economies listed—India, Hong Kong, USA, and Japan—**only India has implemented an optional T+0 settlement cycle.**

- **India:** India's Securities and Exchange Board of India (SEBI) expanded the optional same-day (T+0) settlement cycle to the top 500 stocks by market capitalization, starting January 31, 2025. This implementation is gradual, beginning with the bottom 100 stocks and adding 100 more each month.
- **Hong Kong:** Hong Kong operates on a T+2 settlement cycle. While certain brokers may offer T+0 settlement for specific market transactions, such as early stock settlements to manage tax liabilities, these are not part of the standard market-wide settlement cycle.

- **USA:** The United States transitioned to a T+1 settlement cycle for equities, corporate bonds, and municipal securities in May 2024. There is no market-wide implementation of a T+0 settlement cycle.
- **Japan:** Japan operates on a T+2 settlement cycle and has not implemented a T+0 settlement cycle.

Q68. B

Context: The Reserve Bank of India (RBI) retained the State Bank of India, HDFC Bank and ICICI Bank as Domestic Systemically Important Banks (D-SIBs).

Option a is not correct: Subordinated debt and hybrid instruments fall under **Tier 2 capital**, not CET1.

Option b is correct: CET1 is the **core capital** of a bank under the Basel III framework, designed to **absorb losses** during periods of financial distress. It **primarily consists of:**

- **Common stock** (paid-up equity capital)
- **Retained earnings**
- **Statutory reserves**
- **Other comprehensive income (OCI)**
- **Less deductions** like goodwill and deferred tax assets.

Banks must maintain a **minimum CET1 ratio** (expressed as a percentage of risk-weighted assets) to ensure financial stability.

Option c is not correct: CET1 is a component of capital, not a measure of risk-weighted assets.

Option d is not correct: CET1 is used to **absorb unexpected losses**, not just for short-term liquidity management.

Q69. B

Context: Recently, the Union Minister for Education along with the Minister of Labour and Employment and Youth Affairs launched a World Bank's report titled Jobs at Your Doorstep: A Jobs Diagnostics for Young People in Six States, at an event in New Delhi.

About Jobs at Your Doorstep Report:

- This report serves as both a diagnostic and roadmap to providing strategic linkages and convergence **between education and the jobs agenda of India.**
- It goes deep into the job landscape of **six states:** Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan, and identifies key priority sectors and roles that offer the **highest employment potential for young people** graduating from secondary school.
- The report is a **skills gap analysis that attempts to align** trades offered in schools industry-specific needs of the districts where the schools are present.
- It underscores the significant benefits of embedding skill-based education from Classes 9-12 to prepare students for diverse career paths relying on a **bottom-up approach.**
- The study was initiated to reimagine the skill education offering through **in-depth primary as well as secondary research** in six STARS states.
- **What is the STARS Scheme?**
 - It became effective in 2021 for a period of **five years. up to FY: 2024-25.**

- STARS project would be implemented under the Department of School Education and Literacy, **Ministry of Education with the financial support of World Bank.**
- It is being implemented in six identified States Himachal Pradesh, Maharashtra, Odisha, Rajasthan, Madhya Pradesh and Kerala. These states will be supported for various interventions for improving the quality of education.
- It is **carved out of Samagra Shiksha**, with a focus on those elements of the scheme that will most directly support school education enhancement.

Q70. C

Context: The United States has imposed steep tariffs on Chinese imports, including a 100% duty on electric vehicles, as part of an effort to counter the influx of Chinese goods, dubbed “China Shock 2.0.” India and other countries are also taking steps to curb Chinese imports to protect domestic industries.

China Shock 2.0:

- China Shock 2.0 refers to the latest phase of economic disruption and transformation driven by China's evolving role in the global economy. Following the significant impact of China Shock 1.0, which began in the early 2000s with China's integration into the World Trade Organization (WTO), this new phase highlights the challenges and shifts resulting from China's current economic conditions and strategic pivots.

Background of China Shock 1.0

- **Definition:** The term "China Shock" was first coined to describe the substantial economic impact resulting from China's accession to the WTO in 2001, leading to a surge in Chinese exports, particularly in manufacturing.
- **Impact:** This initial shock led to significant job losses in Western economies, particularly in the United States, where it is estimated that over 2 million manufacturing jobs were lost due to increased competition from Chinese imports. It also contributed to a hollowing out of the manufacturing base in many regions, especially the Rust Belt in the U.S.

Key Features of China Shock 2.0

1. **Economic Slowdown:** As China faces a slowdown in economic growth and structural challenges, its impact on global markets is becoming increasingly pronounced. The shift from rapid growth to a more moderated pace raises concerns about global demand and trade dynamics.
2. **Strategic Industry Focus:** China is pivoting towards new economic drivers, particularly in high-tech sectors such as electric vehicles (EVs), solar energy, and lithium battery production. This shift aims to enhance its competitive edge and reduce reliance on traditional manufacturing.
3. **Global Supply Chains:** The development of domestic supply chains for critical raw materials, including rare earth elements, is a key focus for China as it seeks to strengthen its position in global markets while minimizing vulnerabilities.
4. **Trade Tensions:** In response to these changes, major economies like the United States have implemented significant tariffs on Chinese imports, including duties on EVs and solar cells, as part of efforts to counteract perceived unfair trade practices and protect domestic industries.
5. **Impact on Other Economies:** Countries such as India are feeling the repercussions of China Shock 2.0 as they grapple with increased competition from Chinese exports while attempting to bolster their own manufacturing sectors through measures like anti-dumping duties.

Responses to China Shock 2.0

- **Onshoring and Reshoring:** Many countries are focusing on bringing production back home or reshoring jobs that were previously outsourced to China. For instance, initiatives like the U.S. CHIPS Act aim to boost domestic semiconductor manufacturing.
- **Deglobalization Trends:** A growing sentiment towards reducing global economic interdependence is emerging as countries reassess their reliance on Chinese goods and seek to develop more localized supply chains.
- **Anti-Dumping Measures:** Nations are increasingly imposing anti-dumping duties on Chinese products to protect local industries from being undermined by cheaper imports.

Q71. B

Context: Recently, the Climate and Clean Air Coalition (CCAC) has developed and launched an Air Quality Management Exchange Platform (AQMx). **Hence statement 2 is correct.**

About Air Quality Management Exchange Platform:

- It is a platform that provides the latest **air quality management guidance** and tools proposed to meet **WHO Air Quality Guidelines** interim targets.
- It was developed in response to a resolution passed at this year's **United Nations Environment Assembly** to increase regional cooperation and action on improving air quality globally.
- **Significance of the platform**
 - It will help to address **air quality management capacity gaps**, notably with curated guidance across key themes, including on how to go about air quality monitoring, inventory development, and health impact assessments.
 - It will allow decision makers to see a more complete picture of air pollution's impact and leading to policies that accurately reflect public health needs on a global scale.
 - The platform will expand to **allow regional and sub-regional communities** to **exchange knowledge** about air quality management best practices.

Key facts about Climate and Clean Air Coalition

- It was founded in 2012, and convened within the UN Environment **Programme (UNEP)**.
- It is a voluntary partnership of more than 160 **governments, intergovernmental organizations**, and non-governmental organizations. **Hence statement 1 is not correct.**
- It works to reduce powerful but short-lived climate pollutants (SLCPs) – **methane, black carbon, hydrofluorocarbons (HFCs)**, and tropospheric ozone – that drive both climate change and air pollution.
- It aims to connect ambitious agenda setting with targeted mitigation action within countries and sectors.

Q72. A

Context: The ICAR-Central Marine Fisheries Research Institute (CMFRI) has been designated as a Centre of Excellence for seaweed cultivation by the Department of Fisheries under the Ministry of Fisheries, Animal Husbandry, and Dairying.

More about the news:

- The centre will focus on improving cultivation techniques, creating a seed bank to preserve indigenous species, and conducting environmental impact assessments.

What are seaweeds?

- Seaweed refers to a diverse group of marine plants and algae that grow in the ocean and other water bodies.
- **Ulva Lactuca** (Sea Lettuce), **Caulerpa**, **Fucus**, and **Gracilaria** are well-known species of **marine algae** (seaweed).
- These species are widely used in **food, pharmaceuticals, cosmetics, and biofuel production**.
- **Ulva Lactuca** is commonly consumed in salads, **Caulerpa** is known as "sea grapes," and **Gracilaria** is a key source of **agar**, used in food and biotechnology industries.
- **Fucus** species are rich in **iodine** and used in **traditional medicine**.



Q73. B

Context: A recent study by UNSW Sydney highlights the role of food theft, or “kleptoparasitism,” in the spread of the deadly H5N1 avian influenza among seabirds.

What is Kleptoparasitism?

- **Kleptoparasitism** is a form of feeding behavior in which one animal **steals food that another animal has caught, prepared, or collected**.
- This behavior is seen in various species, including **birds (e.g., frigatebirds stealing fish from other seabirds), insects (e.g., certain ants stealing food from other colonies), and mammals (e.g., hyenas scavenging from lions)**.
- **It is not a direct predatory act but rather opportunistic theft of resources.**

Findings in the study:

- Researchers found that this form of transmission could spread the virus across populations and regions, particularly during long migratory journeys.
- Seabirds are especially vulnerable due to their close contact in breeding colonies.
- Early detection is critical for preventing further spread, especially as the virus has not yet reached Australia.

Q74. D

Context: India has formally joined the International Big Cat Alliance (IBCA), which it launched in 2023.

International Big Cat Alliance (IBCA) :

- **International Big Cat Alliance (IBCA)** is a **multi-country, multi-agency coalition** of **96 big cat range countries, non-range countries** interested in big cat conservation, conservation partners and scientific organizations working in the field of big cat conservation besides **business groups and corporates**, to establish networks and develop synergies in a focused manner.
- Its idea was **1st floated** by India's Prime Minister in **2019**. It was launched in **April 2023** to celebrate the **50th anniversary of Project Tiger**. Hence **statement 1 is not correct**.
- The Union Cabinet had allocated a one-time budgetary support of Rs **150 crore** for IBCA for a five-year period — **2023-24 to 2027-28**.
- It aims at conservation of **seven big cats** namely Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma. Hence **statement 2 is correct**.
- **Objectives of IBCA:**
 - To stop the illegal wildlife trade of the seven big cats.
 - To work towards the conservation of natural habitats of the seven big cats.
 - Mobilisation of financial and technical resources for implementing the conservation and protection agenda.

Governing structure

- It will consist of an **Assembly of Members, Standing Committee** and a **Secretariat**, with its **headquarters in India**. hence **statement 3 is correct**.
- Its **Framework of Agreement** (statute) has been drafted largely on the **pattern of the International Solar Alliance**.
- The statute of IBCA will be finalised by an **International Steering Committee**.
- A **Steering Committee** will be constituted with **nominated national focal points** of founding member countries.
- Appointment of DG by MoEFCC as **Interim Head of IBCA Secretariat** till IBCA appoints its own DG during Assembly meeting.
- IBCA Assembly at **Ministerial level** to be chaired by President, HMEFCC, GoI.

Big Cats

- **'Big Cat'** is a term that is used to apply to any **large species** of the family **Felidae**. Usually, it applies to the members of the genus **Panthera**. These include:
 1. Tiger (*Panthera tigris*)
 2. Lion (*Panthera leo*)
 3. Jaguar (*Panthera onca*)
 4. Leopard (*Panthera pardus*)
 5. Snow Leopard (*Panthera uncia*)

- Two other cats, i.e. **Puma** (*Puma concolor*) and **Cheetah** (*Acinonyx jubatus*), are **not part of Panthera**. But they are usually **included in most listings of 'big cats'**.
- All these cats can usually make **vocalisations** known as '**roars**'.
- The **Indian subcontinent** has been historically home to the **Bengal tiger**, **Asiatic lion**, **Indian leopard**, **Indian/Asiatic cheetah** as well as **Snow leopard**.
- The **cheetah** was declared **extinct in 1952**. In **2022**, the Government of India embarked on an ambitious programme to **introduce African cheetahs** to the **Kuno National Park** in MP.

Q75. B

Context: Recently, the regional assembly of the Azores approved the creation of the largest marine protected area in the North Atlantic, significantly contributing to global conservation goals.

What is **Azores Triple Junction**?

- The **Azores Triple Junction** is a **geologically significant tectonic boundary** in the **North Atlantic Ocean**, where the **Eurasian Plate**, **North American Plate**, and **African Plate** meet.
- It is located near the **Azores Archipelago** and is characterized by **complex fault systems and volcanic activity** due to the interactions of these three plates.
- Unlike subduction zones, this junction is primarily associated with **rift zones and transform boundaries**, making it an important site for studying plate tectonics and mid-ocean ridge processes.



Q76. C

Context: Russia's use of ODAB-1500 thermobaric weapons in Ukraine has garnered attention due to their extremely destructive effects.

About Thermobaric weapons:

- **Thermobaric weapons**, also known as **vacuum bombs** or **fuel-air explosives (FAE)**, operate by **releasing an explosive aerosol or gaseous fuel** that mixes with oxygen in the surrounding air.
- This **fuel cloud is then ignited**, causing a **massive explosion with prolonged high temperatures and extreme pressure**.
- Unlike conventional explosives, **thermobaric weapons use oxygen from the environment**, making them **more destructive in confined spaces like bunkers, caves, and tunnels**.
- These weapons generate a **highly lethal blast wave**, often **stronger than traditional explosives**, leading to devastating effects on both structures and personnel.



Q77. D

Context: The term “shadow fleet” has gained attention in the global maritime industry, particularly in the context of sanctions imposed on Russia due to its ongoing conflict with Ukraine.

What is shadow fleet?

- The **Shadow Fleet** consists of **oil tankers and cargo ships** engaged in **sanctions evasion**, often used by countries like **Russia, Iran, and Venezuela** to continue oil exports despite **Western trade restrictions**.
- These vessels **disable or manipulate AIS tracking**, perform **mid-sea transfers** to obscure trade routes, and operate under **flags of convenience** (such as Panama, Liberia, or the Marshall Islands) to hide ownership.
- Many ships in the Shadow Fleet are **older, poorly maintained, and lack insurance**, raising concerns about **environmental and navigational risks**.

Q78. C

Context: Little Prespa Lake, located on the Albanian-Greek border, is slowly drying up.

	<i>Lakes</i>	<i>Locations</i>
1	Lake Poopó	Bolivia
2	Great Salt Lake	USA
3	Lake Urmia	Iran
4	Small Prespa Lake	Greece and Albania

Q79. C

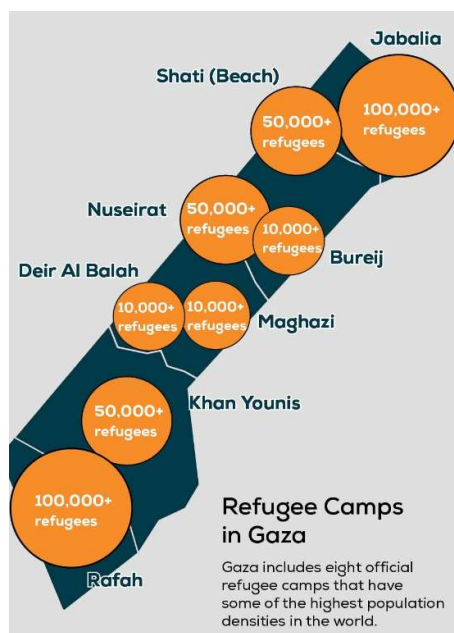
Context: The ongoing Israel-Hamas conflict has led to huge number of Refugee population.

Refugee camps in Gaza:

Places in news: The United Nations Relief and Works Agency (UNRWA) provides essential services within eight recognized refugee camps in the Gaza Strip. However, the agency does not police or govern these camps, as those responsibilities lie with local authorities.

- Beach Camp: Densely populated along the coast.
- Bureauj Camp: Central Gaza camp, heavily affected by conflicts.
- Deir El-Balah Camp: Serves many refugees in central Gaza.
- Jabalia Camp: Largest camp in Gaza Strip, faces overcrowding and poor infrastructure.

- Khan Younis Camp: Serves a large population in southern Gaza.
- Maghazi Camp: Smaller central Gaza camp, affected by economic hardships.
- Nuseirat Camp: More populated near Bureij.
- Rabah Camp: Located near Gaza-Egypt border, heavily impacted by border conflicts



Q80. B

Context: The cutting of undersea cables in the Baltic Sea has escalated geopolitical tensions, particularly in the context of the ongoing Ukraine war.

About Baltic Sea:

- **Location:** Part of the North Atlantic Ocean, situated in Northern Europe, separating the Scandinavian Peninsula from continental Europe.
- **Surrounding Countries:** Denmark, Germany, Poland, Lithuania, Latvia, Estonia, Russia, Finland, and Sweden.
- **Connections:** Links to the Atlantic Ocean through the Danish Straits, facilitating global trade and connectivity.
- **Depth and Area:** Average depth is 55 meters; deepest point is 459 meters.
- **Gulfs:** Contains the Gulf of Bothnia (north), Gulf of Finland (east), and Gulf of Riga (south).
- **Rivers:** Over 250 rivers drain into it, with the Neva River being the largest contributor.
- **Islands:** Hosts over 20 islands and archipelagos, with Gotland (off Sweden's coast) as the largest.



Q81. C

Context: The Ministry of Electronics and IT (MeitY) launched the India Graphene Engineering and Innovation Centre (IGEIC) under the Graphene Aurora Program (GAP), which was initiated in 2023 to foster the graphene technology ecosystem.

More on the news:

- Located in Trivandrum, Kerala, IGEIC is a nonprofit that aims to bridge the gap between R&D and commercialization, providing support to startups and industry. This follows the earlier launch of India's first graphene centre, the India Innovation Centre for Graphene (IICG) in Kerala.

Graphene's Real-World Applications:

- **Ultrafast Transistors:** Graphene's **high electron mobility** makes it ideal for **faster, more efficient transistors**, potentially replacing silicon in future electronics.
- **Transparent & Flexible Screens:** Graphene's **thin, transparent, and flexible nature** makes it perfect for **next-gen displays and touchscreens**.
- **Aerospace Composites:** Graphene **reinforces materials**, making them **lighter, stronger, and more conductive**, useful in **spacecraft and aircraft**.

However,

- While Graphene **improves battery performance**, there is **no proven mechanism** where it can generate electricity from "thin air." Some studies suggest graphene can harvest ambient energy, but **self-charging batteries are not yet commercially viable**.

Q82. B

Context: India's first silicon carbide manufacturing facility will be established in Odisha with an investment of Rs 620 crore by RIR Power Electronics Limited, a leader in semiconductor power electronics.

About Silicon Carbide (SiC) (also known as carborundum):

- It is a hard, synthetic crystalline compound of silicon and carbon. It has excellent thermal conductivity, mechanical strength, and resistance to wear and oxidation. SiC is used in semiconductor devices, mechanical seals, structural ceramics, heat exchangers, optical mirrors, and ballistic armor.
- **Option a is not correct:** SiC is a **semiconductor**, not a **highly conductive material** like metals. While SiC is used in **high-power electronics**, it is **not a superconductor**.
- **Option b is correct:** Carborundum (Silicon Carbide - SiC) is **one of the hardest known materials**, ranking **just below diamond** on the Mohs hardness scale. It is extensively used in **abrasives, cutting tools, grinding wheels, and sandpapers** due to its **superior wear resistance**.
- **Option c is not correct:** Carborundum is brittle, not ductile, making it unsuitable for flexible applications.
- **Option d is not correct:** SiC is **highly thermally stable** and used in **heat-resistant coatings, spacecraft shields, and furnace linings**.

Q83. C

Context: Scientists at the Indian Institute of Science (IISc), Bengaluru have made a significant breakthrough in neuromorphic computing, which mimics the human brain's structure and functioning.

More on the news:

- They've developed an analogue computing platform that can process and store data using 16,500 conductance states, a major advancement over traditional computers limited to two states.
- This platform improves efficiency and reduces energy consumption for complex AI tasks, such as training models like ChatGPT.
- The team also demonstrated the system's capabilities by recreating NASA's "Pillars of Creation" image with much less energy.
- This innovation promises to revolutionize computing, impacting industries like AI, finance, and tech by enabling faster data processing and more efficient machine learning systems.
- **Option a is not correct:** Neuromorphic computing focuses on **parallelism** rather than raw clock speeds. While energy-efficient, its performance is **not measured in GHz** like traditional processors.
- **Option b is not correct:** Neuromorphic chips are **not designed for traditional data storage** or cloud-based applications but rather **edge computing and AI inference**.
- **Option c is correct:** Neuromorphic computing mimics the structure of the human brain, using artificial neurons and synapses. Unlike traditional computing, which processes information sequentially, **neuromorphic systems process data in parallel**, allowing for **real-time learning and decision-making**. Neuromorphic chips are **highly energy-efficient**, consuming significantly less power than conventional CPUs and GPUs.
- **Option d is not correct:** Neuromorphic computing **moves away from the Von Neumann bottleneck** by integrating memory and computation, rather than keeping them separate like in classical architectures.

Q84. D

Context: Earth will temporarily capture a small asteroid named 2024 PT5, which will stay for two months before moving back into space.

About Mini-moon:

- Mini-moons **are asteroids** that **fail to escape Earth's gravity** and end up orbiting the planet for some time.
- They are usually **very small and hard** to detect — only four mini-moons of Earth have ever been discovered, and none are still orbiting Earth.
- These events are relatively frequent, with similar occurrences happening every few decades.

- **How does Earth capture Mini Moons?**

- Mini moons are captured from the **Near-Earth Object** (NEO) population, which consists of asteroids and other celestial bodies that pass close to Earth.
- NASA classifies any space object that comes **within 120 million miles** (190 million kilometers) of our planet as a **near-Earth object**, while objects within 4.7 million miles (7.5 million kilometers) are considered potentially hazardous.

Key facts about 2024 PT5

- It is an **Apollo-class NEO**, which follows an orbit similar to that of previous mini moons like 2022 NX1.
- The asteroid was discovered with the help of the NASA-funded **Asteroid Terrestrial-impact Last Alert System (ATLAS)**.
- It is estimated to be just 33 feet long and is too small to be visible to the naked eye or through typical amateur telescopes.
- It is within the brightness range of telescopes used by professional astronomers.
- **Significance:** The observations of 2024 PT5 will help scientists **expand the knowledge of asteroids** that pass close to the Earth and those that sometimes collide with it.

Q85. B

Context: The Mumbai police have confirmed that Dharmaraj Kashyap, one of the three accused in the murder case of NCP leader and former Maharashtra Minister Baba Siddique, is not a minor. It is reported that the confirmation came after an ossification test was conducted on him.

Ossification test:

- **Purpose:** Determines age by assessing bone development and the union of epiphyses in long bones.
- **Bones used:** Radius, ulna, humerus, tibia, fibula, femur.
- **Accuracy:** Provides an estimate within a margin of two years (e.g., 16-18 years), allowing for a 6-month error on either side.
- **Limitations:** Factors such as climate, diet, and heredity can affect ossification rates.

Q86. C

Context: Scientists have detected a lost Mayan city, hidden for centuries by the dense Mexican jungle, using LiDAR.

What is LiDAR?

- LiDAR (Light Detection and Ranging) is a remote sensing technique that employs laser pulses to measure distances between a sensor (often mounted on an aircraft) and Earth's surface.
- This technology enables the creation of detailed 3D models of ground elevation with a precision of up to 10 centimeters, as reported by the US Geological Survey.

How does LiDAR work?

- LiDAR instrumentation comprises a laser, a scanner, and a GPS receiver.
- The rapidly firing laser travels to the ground where it hits vegetation, building, and various topographic features.
- This light is reflected or scattered, and recorded by the LiDAR sensor.

- The system calculates the light pulses' two-way travel time to arrive at the distance between the terrain and the sensor.
- It processes this information with Global Positioning System (GPS) and Inertial Measurement System (IMS) data, to create an elevation map of Earth.

Applications:

- LiDAR is extensively used in **mapping and surveying terrain** for urban planning and infrastructure development.
- It plays a crucial role in **navigation systems for autonomous vehicles**, helping them identify road assets and obstacles.
- LiDAR is also used in **creating interactive media** for VR and AR applications by scanning environments to create realistic virtual experiences.

While,

- **Monitoring weather conditions during heavy rainfall** is not a primary application of LiDAR, as its performance degrades in adverse weather like rain or fog due to interference with laser beams.
- **Detecting underwater objects in deep oceans** is not feasible because LiDAR is typically limited to shallow water depths (up to 40 meters) using bathymetric techniques.

Q87. A

Context: A new study says scientists have discovered a “black hole triple” in space for the first time.

About the discovery:

- The system **comprises a black hole at its centre, currently in the process of consuming a small star spiralling very close to it.** There is also a second star, which appears to be circling the black hole but is actually far away.
- The discovery of the system, **located about 8,000 light years away from Earth** (one light year is the distance light travels in a year, 9.5 trillion kilometre), has raised questions about how black holes are formed.

What is “Black hole triple” system?

- Many black holes discovered until now have been part of binary systems, consisting of a black hole and a secondary object (such as a star or another black hole).
- **But the black hole triple not only has one star which orbits the black hole about every 6.5 days, but also a more far-off star which orbits it every 70,000 years.**
- Situated in the constellation of **Cygnus**, the system features one of the oldest known black holes, the V404 Cygni, which is nine times as big as the Sun in our solar system.
- **Option a is correct:** black hole triple system specifically refers to a configuration where three black holes interact gravitationally, which is distinct from other systems that may involve different types of stellar remnants or configurations.
- **Option b is not correct:** while systems with neutron stars exist, a true black hole triple system specifically involves three black holes.
- **Option c is not correct:** gravitational waves can be produced by various types of binary and multiple systems, not exclusively by triples.
- **Option d is not correct:** while some black holes form from supernova remnants, not all in a triple system necessarily do so, especially if they formed through direct collapse or other mechanisms.

Q88. D

Context: Indian Space Research Organisation (ISRO) has announced the launch of its first analog or simulated space mission at Leh in Ladakh.

India's first Analog Mission:

- Located in Leh, Ladakh, the mission includes a **compact, inflatable habitat named Hab-1** which will simulate life in an interplanetary habitat. **Hence statement 1 is not correct.**
- **Aim:** To study the challenges of extra-terrestrial conditions, as part of efforts towards developing a long-term human spaceflight programme. **Hence statement 2 is not correct.**
- Hab-1 is designed to **mimic environments on Mars and the Moon**. The simulation will explore the conditions of an interplanetary habitat, testing new technologies, robotic equipment, vehicles, habitats and communications.
- The mission is spearheaded by **ISRO's Human Spaceflight Centre** and brings together partners from AAKA Space Studio, the University of Ladakh, IIT Bombay, and is supported by the Ladakh Autonomous Hill Development Council.

Why was Ladakh chosen?

- Ladakh's extreme isolation, dry climate, and barren, high-altitude terrain make it **ideal for simulating conditions similar to Mars and the Moon**.
- **Similarities:**
 - Both Moon and Ladakh have extremely dry environments.
 - Ladakh experiences significant temperature fluctuations, similar to both the Moon and Mars.
 - Ladakh's rocky, barren terrain resembles the terrain of the Moon and Mars.
- **Dissimilarities:**
 - The Moon has virtually no atmosphere, whereas Mars has a thin atmosphere, whereas, Ladakh is a part of Earth's atmosphere.
 - The Moon has no water vapour in its atmosphere, Mars has some water vapour, whereas Ladakh's atmosphere, though dry, still contains some moisture.
 - The Moon has an **intense thermal radiation** caused by the direct sunlight which is hard to replicate on Earth.

Q89. D

Context: AI tools are being used to extract money by impersonating friends, family, and colleagues.

WaveNet and Neural Vocoder:

- **WaveNet**, developed by **DeepMind**, is a **deep learning-based model** that generates **highly realistic human-like speech**.
- **Neural Vocoder** are AI-powered models that enhance **speech synthesis** by converting **text or digital signals into natural-sounding speech**.
- These technologies are widely used in **virtual assistants (e.g., Google Assistant, Siri), AI voiceovers, text-to-speech (TTS) systems, and deepfake audio generation**.

Q90. D

Context: Justice Sanjiv Khanna took oath as the 51st Chief Justice of India (CJI) on Monday, with President Droupadi Murmu administering the oath of office at a ceremony held at Rashtrapati Bhavan.

- **Justice K.G. Balakrishnan:** Justice K.G. Balakrishnan (2007-2010) was the first Dalit Chief Justice of India.
- **Justice Hidayatullah:** Justice Mohammad Hidayatullah served as Acting President of India in 1969 while being Vice President. He is the only CJI to have held the position of President (even in an acting capacity).
- **Justice D.Y. Chandrachud:** Justice D.Y. Chandrachud (appointed in 2022) is the 50th Chief Justice of India.
- **Justice Ranganath Misra:** Justice Ranganath Misra (1990-1991) was nominated to the Rajya Sabha in 1998 after retirement, making him the first CJI to be in the Upper House.

Q91. B

Context: As Donald Trump returns to the White House, social media in the US is seeing the rise of the '4B' movement, where women swear off sex and marriage with men to protest patriarchal and often misogynist institutions and practices.

The 4B Movement: A Radical Feminist Initiative in South Korea

The **4B Movement** is a radical feminist movement that originated in South Korea between 2017 and 2019. It challenges entrenched patriarchal norms by advocating for women to reject traditional societal roles and relationships with men. The name "4B" refers to the four tenets of the movement, all beginning with the Korean word *bi* (ㅂㅣ), which means "no." These principles are: no marriage (*bihon*), no childbirth (*bichulsan*), no dating (*biyeonae*), and no sexual relationships with men (*bisekseu*).

The Four Tenets

1. **No Marriage (*Bihon*):**
 - Rejecting heterosexual marriage as it often leads to unequal power dynamics and domestic violence.
 - Many women see marriage as a trap that enforces unpaid labor and subordination.
2. **No Childbirth (*Bichulsan*):**
 - Refusal to bear children due to lack of workplace accommodations and career setbacks for mothers.
 - South Korea's low fertility rate (0.72 in 2023) reflects broader economic insecurities and high child-rearing costs.
3. **No Dating (*Biyeonae*):**
 - Avoiding romantic relationships with men as they are seen as extensions of patriarchal control.
 - Women prioritize their own autonomy rather than conforming to societal pressures.
4. **No Sexual Relationships (*Bisekseu*):**
 - Abstaining from sexual relationships with men to reject patriarchal family structures.

Origins

The movement emerged online through platforms like WOMAD and Twitter during South Korea's #MeToo reckoning. It gained momentum in 2019 amidst rising cases of violence against women and the election of conservative President Yoon Suk Yeol, whose policies were seen as reinforcing patriarchal norms.

Impact on Society

1. Demographic Effects:

- The movement has been linked to South Korea's declining birth rate, although economic insecurity remains a major factor behind this trend.

2. Digital Activism:

- Followers use social media to share experiences, protest patriarchal norms, and promote feminist ideologies anonymously.

3. Global Influence:

- The movement has inspired feminist discussions internationally, especially after Donald Trump's election in the U.S., highlighting parallels in gender inequality across cultures.

Criticism

- Some critics argue that the movement's rejection of all forms of relationships with men is extreme and divisive.
- Certain factions associated with WOMAD have faced accusations of misandry, transphobia, and homophobia.

Q92. A

Context: The Central Bureau of Investigation (CBI) has recently started a second round of polygraph tests as part of their investigation into the rape-murder of a woman doctor at the institution.

Statement 1 is correct: A **Polygraph Test (Lie Detector Test)** measures **autonomic nervous system (ANS) responses** such as blood pressure, heart rate, respiratory rate, and skin conductivity when a person answers questions. The assumption is that **deception causes physiological changes**, which the machine records. However, polygraphs **do not detect lies directly**—they only measure stress responses, which can be triggered by anxiety, fear, or other emotions.

Statement 2 is correct: **Brain Fingerprinting** is a neuro-psychological technique that detects whether an individual has prior knowledge of a crime-related stimulus. It records **P300-MERMER (Memory and Encoding Related Multifaceted Electroencephalographic Response)** waves using **Electroencephalography (EEG)**. If the brain **recognizes** certain images or words related to a crime, the P300 wave is triggered.

Statement 3 is not correct: In **Narco-analysis**, a subject is injected with drugs like **sodium pentothal, sodium amytal, or scopolamine**, which reduce higher-level thinking and make it harder to fabricate responses. However, **narco-analysis is NOT completely reliable** because:

- The person may still **give false information** or **imagine things**.
- Responses depend on **individual tolerance to the drug**, making it unpredictable.
- It does not guarantee **voluntary disclosure**—statements made under the influence may not be admissible in court.

Statement 4 is not correct: **fMRI (Functional Magnetic Resonance Imaging) lie detection** is an advanced technique that measures **brain activity** when a person tells a lie. While it is **not explicitly banned**, the Supreme Court (*Selvi v. State of Karnataka*, 2010) ruled that using such tests without consent violates **Article 20(3) of the**

Indian Constitution, which protects against self-incrimination. Unlike polygraphs, which measure **physiological** responses, **fMRI detects changes in brain activity** in regions linked to deception.

Q93. B

Context: The President of India has recently approved the formation of the 23rd Law Commission of India, setup by Government of India. (September 1, 2024, to August 31, 2027). **Hence statement 3 is not correct.**

About Law Commission of India:

- It is a **non-statutory body** and is constituted by a notification of the Government of India, Ministry of Law & Justice. **Hence statement 1 is not correct.**
- It is constituted with definite **terms of reference** to carry out research in the field of law and the Commission makes recommendations to the Government (in the form of Reports) as per its terms of reference.
- It functions to the Ministry of Law and Justice as an **advisory body**. **Hence statement 2 is correct.**

History of Law Commission of India

- The first **pre-independence** law commission was established in 1834 by the British Government in India.
- It was established by **the Charter Act of 1833** and was chaired by **Lord Macaulay**.
- The **first Law Commission** of independent India was established in **1955** under the chairmanship of the former Attorney General for India **M. C. Setalvad**.
- This Commission was created for a period of three years and this practice has persisted ever since then, resulting in the reconstitution of Law Commissions every three years via executive orders.
- The **executive orders** that constitute the Law Commissions also **specify their scope and purpose**, and thus these fluctuate periodically.
- Since then, twenty one more Law Commissions have been constituted, each with a three-year term and with certain terms of reference.
- The Law Commission has taken up various subjects on references made by the Department of Legal Affairs, Supreme Court and High Courts.
- The **Twenty Second Law Commission** has been notified with effect from 21st February, 2020 for a term of **3 years**.

Q94. C

Context: Recently, the union home minister announced the creation of five new districts in the Union Territory (UT) of Ladakh.

Key Details

- The five new districts are Zaskar, Drass, Sham, Nubra and Changthang.
- The decision comes days before the September 1 - October 2 padayatra (march) call given by the Leh Apex Body (LAB) to Delhi, an influential civil society group in the region.
- Since 2020, the LAB, along with the Kargil Democratic Alliance (KDA), has been demanding Statehood, inclusion of Ladakh under the sixth schedule of the Constitution (protection of tribal areas), job reservation for locals and two Lok Sabha and one Rajya Sabha seat for the region.

Q95. A

Context: Australia & Pacific Leaders Endorse Pacific Policing Initiative to Counter China's Influence.

Pacific Policing Initiative (PPI)

- It is a major regional initiative to strengthen collective peace and security throughout the Pacific.
- The PPI will boost the capability of Pacific nations to meet law and order and internal security requirements, and to support each other in times of need.

The PPI has three pillars:

- Up to four regional police training Centres of Excellence, located in the Pacific, to enhance policing capabilities through specialist training and operational support for Pacific police personnel.
- The Pacific Police Support Group (PPSG) - a multicountry police capability, with a ready pool of trained Pacific police to deploy in response to Pacific country requirements, such as for major event management or additional capacity in times of crisis.
- A PPI Policing Development and Coordination Hub to be hosted in Brisbane – including access to state of the art AFP facilities for training and to prepare for any PPSG deployments.
- The PPI is a practical contribution to the Pacific Islands Forum's peace and security vision outlined in the 2050 Strategy for the Blue Pacific Continent.

Q96. A

Context: India and the Gulf Cooperation Council (GCC) recently adopted a Joint Action Plan for 2024-2028 to facilitate joint ventures in various sectors including energy, trade, security, agriculture, health, and food security.

About Gulf Cooperation Council

- The Gulf Cooperation Council is a regional, intergovernmental, political, and economic union comprising Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.
- The council's main headquarters is located in Riyadh, the capital of Saudi Arabia.
- The Gulf Cooperation Council was founded in 1981 with a charter. The Charter of the GCC was signed on 25 May 1981, formally establishing the institution.
- All current member states are monarchies, including three constitutional monarchies (Qatar, Kuwait, and Bahrain), two absolute monarchies (Saudi Arabia and Oman), and one federal monarchy (the United Arab Emirates).
- There have been discussions regarding the future membership of Jordan, Morocco, and Yemen.
- The Peninsula Shield Force is the military arm of the GCC, formed in 1984.

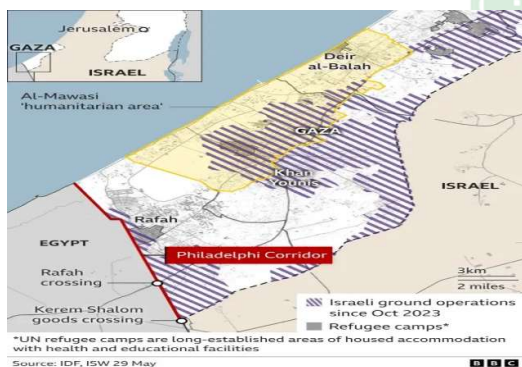


Q97. A

Context: The Israeli Prime Minister intends to control the Philadelphi corridor, including the Rafah crossing after its occupation in the Israel-Hamas war.

About Philadelphi corridor:

- It is a ribbon of land about 14 kms in length and 100 metres wide along **Gaza's border with Egypt**.
- It was designated as a **demilitarised border** zone after the withdrawal of Israeli settlements and troops from Gaza in 2005 and runs from **the Mediterranean to the Kerem Shalom** crossing with Israel.
- The Corridor was **originally established** under the 1979 **Israel-Egypt peace treaty** as a 100-meter-wide buffer zone.
- The zone was later expanded beginning during the Second Intifada to be several hundred meters wide. It covers the entire 8.7-mile-long border.
- The Rafah crossing between Egypt and Gaza is within the Philadelphi Corridor.
- In 2005, as part of Israel's unilateral withdrawal from Gaza, Egypt and Israel signed an agreement by which Egypt would secure the border between Egypt and Gaza to prevent the smuggling of weapons into the Strip.
- Egypt maintains a one-kilometer-wide buffer zone on its side of the border, with plans to expand it.



Q98. B

Context: Indian Army has completed the acquisition of 100 Akashteer Air Defence Systems.

About Akashteer Systems

- They are advanced Air Defence Control and Reporting Systems (ADCRS) which will serve as a critical asset in safeguarding country from aerial threats, including missile and rocket attacks.
- They are developed indigenously by Bharat Electronics Limited (BEL)
- Significance: Enable monitoring of low-level airspace over battle areas of Indian Army, offers ability to monitor and respond to enemy attacks in real-time, etc.

Q99. A

Context: Recent satellite imagery reveals a significant military buildup on Triton Island, the closest landmass in the disputed Paracels archipelago to Vietnam.

About Triton Island:

- It is a tiny island that's **part of the Paracel Islands chain** located in the **South China Sea**.

- It covers a tiny area of about 1.2 square kilometers and is situated southwest of the main islands in the group.
- The island is approximately 4,000 feet long by 2,000 feet wide and, **until recently, was completely uninhabited.**
- The **Paracel Islands** are **claimed by multiple countries**, primarily **China, Vietnam, and Taiwan**, as part of their territorial waters, making the region politically sensitive.
- Although Triton Island is uninhabited, it plays a **strategic role due to its location in the South China Sea**, an area known for its rich fishing grounds and potential oil and gas reserves.



Q100. C

Context: The report ‘Coral Triangle at Risk: Fossil Fuel Threats and Impact’ released at the 16th Conference of Parties (COP16) to the Convention on Biological Diversity (CBD).

About the Report

- The report released by Earth Insight and SkyTruth highlights the potential threats posed by fossil fuels to the Coral Triangle.
- According to the report coral triangle spans seven countries in Southeast Asia and Melanesia: Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore, Timor-Leste and Solomon Islands. **Hence statement a is correct.**
- It is one of the world’s most bio-diverse marine regions.

Significance of Coral Triangle:

- It hosts 76% of world’s coral species, over 2,000 coral fish species, and six of seven marine turtle species, and **over 30% of the world’s coral reefs. Hence statement b is correct.**
- It supports 120 million people who rely on it for food, and income, with its habitats critical for marine diversity, earning it nickname “the Amazon of the seas.”

Threats being faced by Coral Triangle:

- Oil and Gas Exploration: Over 100 offshore oil and gas blocks are currently operating in Triangle.
- It threatens Triangle’s delicate ecosystems, including coral reefs, mangroves, and seagrasses
- Noise pollution: From shipping and exploration activities harms marine life. Eg: Man-made noises can alter animal behaviors by damaging hearing or masking animal sounds. **Hence statement d is correct.**

Protection of coral triangle:

- The Coral Triangle is **not recognized under the Ramsar Convention** (which focuses on wetlands); instead, it is protected through initiatives like the **Coral Triangle Initiative (CTI)**. Hence **statement c is not correct**.



*For further clarifications and feedback feel free to
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