R.C. Reddy IAS Study Circle

UPSC CSE PRELIMS 2025 TEST SERIES

GRAND TEST-3

GENERAL STUDIES PAPER-I (GS)

Key with Explanation

Q1.C

- **Statement 1 is correct**: The **Third Five-Year Plan (1961–66)** faced serious challenges due to the **India-China War (1962), the India-Pakistan War (1965), and two consecutive droughts (1965-66)**. Due to economic difficulties, **India had to devalue its currency in 1966 and sought assistance from the IMF**.
- **Statement 2 is not correct**: The **Fourth Five-Year Plan (1969–74)** aimed at growth with stability but was impacted by **inflation, Indo-Pak war (1971), and global oil crisis (1973)**. However, the **Rolling Plan concept was introduced in 1978 by the Janata Government after rejecting the Fifth Five-Year Plan (1974-79)**. After **Indira Gandhi returned to power in 1980, she scrapped the Rolling Plan and introduced the Sixth Five-Year Plan**.
- **Statement 3 is correct**: The **Seventh Five-Year Plan (1985–90)** focused on modernization and self-reliance but also saw an increase in imports and fiscal deficit. By the end of the plan (1990), India's **foreign exchange reserves were severely depleted**, leading to the **1991 Balance of Payments (BoP) crisis**.

Q2. D

- **Statement 1 is not correct**: In 1947, India was still part of the Sterling Area, and the Indian Rupee was pegged to the British Pound. When Britain devalued the Pound Sterling by about 30% in 1949 (not 1947), India followed suit and devalued the Rupee to maintain parity.
- **Statement 2 is not correct**: India did borrow from the IMF in **1981** (not 1977) under the **Extended Fund Facility (EFF)** due to the oil crisis, balance of payments problems, and slow growth. The 1977 period was politically turbulent (post-Emergency), but the major IMF borrowing happened later.
- **Statement 3 is not correct**: The last time India sought IMF assistance was in **1991** (not 1997) during its severe balance of payments crisis. By 1997, India had sufficient forex reserves and was not significantly affected by the Asian Financial Crisis.

Q3. D

- **Statement 1 is correct**: The committee explicitly recommended the creation of "small, local banks" restricted to states or clusters of districts to serve local trade, small industries, and agriculture. This aimed to decentralize banking services while maintaining correspondent relationships with larger national/international banks
- **Statement 2 is correct**: The committee emphasized raising the capital adequacy ratio to 9% by 2000 and 10% by 2002 to improve banks' risk absorption capacity and inherent stability. This was implemented through phased RBI reforms.
- **Statement 3 is correct**: The **committee introduced the idea of 'narrow banking'**, where **weak public sector banks** should be **restricted to holding government securities and not engage in risky lending**. This was meant to **protect depositors' money** and ensure **financial stability**.

Q4. C

- The **Indradhanush Reforms (2015)** were **designed to revamp Public Sector Banks (PSBs)** by addressing their financial health and governance.

- The **7-pronged strategy** of **Indradhanush** included:
    1. **Appointments** – More autonomy in appointing top executives.
    2. **Bank Board Bureau (BBB)** – Set up to improve governance.
    3. **Capitalization** – ₹70,000 crore capital infusion to strengthen PSBs.
    4. **De-stressing PSBs** – Addressing NPAs and loan recovery mechanisms.
    5. **Empowerment** – Greater autonomy for decision-making.
    6. **Framework of Accountability** – Strengthening performance monitoring.
    7. **Governance Reforms** – Enhancing professionalism in banking operations.

This was **critical for tackling Non-Performing Assets (NPAs) and ensuring better financial stability of PSBs**.

Q5. A

- **Statement I is correct**: Before IBC, India had one of the **longest insolvency resolution timelines (4-5 years on average)**, leading to **poor recovery rates** and inefficiencies in the system. **IBC streamlined this process** by setting a **time limit of 180 days (extendable to 330 days)** for resolving cases. Due to IBC, **India's Ease of Doing Business ranking improved significantly in the "Resolving Insolvency" parameter**, climbing from **136th in 2017 to 52nd in 2019**.
- **Statement II is correct**: A key reason for this improvement is the shift from the **"Debtor in Possession" model (where promoters controlled the firm even during insolvency)** to the **"Creditor in Control" model**, where lenders and financial creditors take charge and decide on restructuring or liquidation. This **ensured faster decision-making, reduced delays, and increased recovery rates**, making IBC an effective tool against the **"Chakravyuh Challenge."**

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

Q6. D

- **Statement 1 is correct**: The interest rate on WMA is linked to the **RBI's repo rate**, and if a government **exceeds its WMA limit**, the excess amount (overdraft) attracts a **penal interest rate** (higher than the repo rate).
- **Statement 2 is correct**: For **State Governments**, WMA is of two types:
    - **Special WMA** – Provided against **government securities** as collateral.
    - **Normal WMA** – Based on the **state's fiscal position** and **previous years' revenue and expenditure patterns**.
- **Statement 3 is correct**: The **Central Government's WMA limit is reviewed annually** by the RBI in consultation with the **Ministry of Finance**, while State WMA limits are based on **recommendations of the Finance Commission and RBI guidelines**.

Q7. D

Measuring poverty across countries requires a common benchmark, but discrepancies arise when using **Purchasing Power Parity (PPP) basis** versus **Nominal GDP basis**. These two approaches yield different results due to variations in currency valuation, price levels, and exchange rate fluctuations.

1. Understanding the Key Concepts

A. Nominal GDP-Based Poverty Measurement

- **Nominal GDP** is measured at **current market exchange rates**, meaning it reflects the total economic output of a country in its own currency, converted into US dollars (or another standard currency) based on prevailing exchange rates.
- **Poverty lines calculated using nominal GDP** depend on income levels in USD terms, which can fluctuate due to exchange rate variations rather than actual economic conditions.

B. Purchasing Power Parity (PPP)-Based Poverty Measurement

- **PPP adjusts for the cost of living** by comparing how much money is needed to purchase the same basket of goods and services across countries.
- The **World Bank's international poverty line (e.g., $2.15 per day in PPP terms)** uses this method to reflect a standardized measure of well-being.
- PPP is considered more accurate for cross-country poverty comparisons because it accounts for domestic price levels rather than exchange rates.

2. Why Do Discrepancies Exist?

PPP vs. Nominal Exchange Rates

- **Nominal GDP uses market exchange rates**, which are influenced by factors like **inflation, trade policies, and speculative currency movements**.
- **PPP reflects the real cost of goods and services in a country**, avoiding distortions caused by currency fluctuations.
- Example: A country with a devalued currency might have a **low nominal GDP per capita**, making it appear poorer than it actually is, while its **PPP-adjusted income might show higher purchasing power**.

Cost of Living Variations

- **PPP considers local prices** of essentials like food, housing, and healthcare.
- **Nominal GDP-based poverty estimates do not adjust for domestic cost differences**, leading to underestimation or overestimation of poverty.
- Example: **India and the U.S.** may have similar nominal incomes in some sectors, but since the cost of living is much lower in India, **PPP-adjusted poverty lines show fewer people in extreme poverty** than nominal exchange rate calculations suggest.

Currency Volatility and Inflation Effects

- **Exchange rate fluctuations impact nominal GDP poverty measures** without necessarily affecting people's real purchasing power.
- Countries experiencing **hyperinflation or currency depreciation** may appear poorer in nominal GDP terms, while their real consumption levels remain stable in PPP terms.

Underestimation of Poverty in Developing Countries

- **Nominal GDP-based poverty lines** often underestimate poverty in low-income nations because their exchange rates are typically lower than what PPP suggests.
- **PPP-adjusted poverty thresholds show a higher proportion of people living in poverty** compared to nominal calculations, reflecting actual economic hardships.

Q8. C

Socio-Economic Caste Census (SECC) 2011

The **Socio-Economic Caste Census (SECC) 2011** was a comprehensive survey conducted in **India** to collect information on the **socio-economic status** of rural and urban households. It was **the first SECC after Independence** and aimed at identifying **poverty and caste-based social structure** to improve policy-making for welfare schemes.

SECC 2011 Classification:

SECC 2011 divided households into three categories:

1. **Automatic Exclusion** (Households considered economically well-off and excluded from welfare benefits).
2. **Automatic Inclusion** (Households considered extremely poor and automatically included in welfare schemes).
3. **Deprivation Criteria** (Households ranked based on specific deprivation indicators).

Automatic Exclusion Criteria (Well-off Households):

Households were automatically excluded if they met any of the following conditions:

1. **Households owning a motorized two-wheeler, three-wheeler, or four-wheeler** (except for commercial use).
2. **Households with a Kisan Credit Card (KCC) limit of ₹50,000 or more.**
3. **Households with a member working in government, PSU, or earning ₹10,000+ per month.**
4. **Households with non-agricultural enterprises registered with the government.**
5. **Households paying income tax or professional tax.**
6. **Households with landline phones, refrigerators, and irrigation equipment.**
7. **Households owning 5+ acres of irrigated land or 10+ acres of non-irrigated land.**

Automatic Inclusion Criteria (Most Vulnerable Households):

Households were automatically included if they met any of the following conditions:

1. **Households with no shelter.**
2. **Households with destitute or begging members.**
3. **Households where all members are manual scavengers.**
4. **Households where all earning members are bonded laborers.**

Q9. C

- **statement a is correct:** FTP 2023 moves away from a rigid 5-year policy cycle and adopts a continuous, responsive update mechanism based on global trade dynamics.
- **Statement b is correct**: The policy targets $2 trillion in exports by 2030, covering both goods and services, to enhance India's role in global trade.
- **Statement c is not correct (Correct Answer):** The RoDTEP scheme continues under FTP 2023 to refund embedded taxes and duties, rather than being replaced.

- **Statement d is correct**: FTP 2023 promotes e-commerce exports, simplifies compliance procedures, and facilitates digital trade integration to enhance market access.

Q10. A

	Ministerial Conferences (MC)	***Places***	***Outcomes***
1	Ministerial Conferences 1	Singapore	Information Technology Agreement (ITA-I)
2	Ministerial Conferences 4	Doha	TRIPS & Public Health Declaration
3	Ministerial Conferences 9	Bali	Trade Facilitation Agreement (TFA)
4	Ministerial Conferences 10	Nairobi	Ended agricultural export subsidies
5	Ministerial Conferences 12	Geneva	Fisheries Subsidies Agreement

Q11. D

- **Statement I is incorrect**: while the amendment removed the split provision (1/3rd defection rule), it created a new loophole where entire groups now defect under the guise of "merger" (2/3rd majority required). In practice, this has led to larger-scale defections (e.g., Maharashtra 2022, Goa 2022, Madhya Pradesh 2020), showing the amendment failed to fully curb defections.
- **Statement II is correct**: The **91st Amendment Act, 2003**:
    - **Removed the "split" provision** under the **Tenth Schedule**, making defection stricter.
    - **Restricted the size of the Council of Ministers** to **15% of the total strength of the legislature** (except for smaller states where a minimum of 12 ministers is allowed).
- **Hence option d is correct answer.**

Q12. D

- **Statement 1 is not correct**: **Cabinet Committees are not constitutional bodies**; they are **extra-constitutional** (not mentioned in the Constitution). They are **established under the Rules of Business of the Government of India** to improve efficiency in decision-making. **Article 352 deals with National Emergency** and has **no relation** to Cabinet Committees.
- **Statement 2 is not correct**: Cabinet Committees are **set up by the Prime Minister**, not the President. The PM decides their **composition, structure, and role**, and they help in **detailed examination of policies** before final Cabinet approval.
- **Statement 3 is not correct**: While **Cabinet Ministers** primarily form these committees, the **Prime Minister can include Ministers of State (MoS)** as **special invitees** in some cases. Example: Ministers of State (independent charge) are sometimes included in the **Cabinet Committee on Economic Affairs (CCEA)**.

Q13. D

- **Statement 1 is not correct**: Article 80(1) already sets the **maximum strength** of Rajya Sabha at **250** (238 elected + 12 nominated). The current strength is **245** (233 elected + 12 nominated). Increasing seats to 250 **does not require a constitutional amendment** as the cap is already constitutionally permitted. However, seat distribution adjustments among states would require a constitutional amendment under **Article 4** (if altering state-specific allocations).

- **Statement 2 is not correct**: Rajya Sabha seat allocation to states is **not based on population** but on the **Fourth Schedule of the Constitution**, which reflects historical agreements and statehood status. Population-based delimitation applies only to Lok Sabha seats, which are frozen at the **1971 census** level until 2026. Rajya Sabha's state-wise seats remain fixed unless altered by constitutional amendments (e.g., creation of new states like Telangana in 2014).

Q14. C

- **Statement 1 is not correct**: The **Speaker of the Lok Sabha** is elected from among the **sitting Members of Parliament (MPs)** and remains a **member of their political party** even after assuming the role. There is **no constitutional or legal requirement** for the Speaker to resign from their party upon election. However, by **convention**, the Speaker is expected to function in a **non-partisan manner**, rising above party politics.
- **Statement 2 is not correct**: The **Speaker does not leave their party upon taking office**, so there is **no need to "rejoin"** after the tenure ends. **The Anti-Defection Law (Tenth Schedule)** applies to MPs who voluntarily give up their party membership or defy the party whip. However, the **Speaker is exempt from disqualification under the Tenth Schedule while making decisions on disqualification cases.** Even if the Speaker **joins another party after tenure**, the law **does not apply retroactively**.

Q15. B

- **Resolutions** are **substantive motions** that **require a vote** to declare Parliament's formal opinion or decision.
- **Motions** include both **substantive** (voted upon) and **procedural/non-voting** types (e.g., adjournment motions for discussion without a vote).
- **Key Differentiator:** While all resolutions are motions put to vote, **not all motions are voted upon** (e.g., motions for short-duration discussions)

Q16. C

Statement 1 is not correct: Parliamentary privileges under **Articles 105 and 194** apply **only** to members of Parliament, state legislatures, and authorized participants (e.g., Union Ministers, Attorney General). The President, Vice-President, and Governors **do not enjoy parliamentary privileges**, as their roles are governed by separate constitutional provisions. For example:

- **President:** Immunity under **Article 361** (not parliamentary privileges).
- **Governors:** Similar immunity under **Article 361** but not legislative privileges.

Statement 2 is not correct: The Supreme Court has clarified that parliamentary privileges **cannot override fundamental rights**. Key judgments include:

- **Kihoto Hollohan v. Zachillhu (1992):** Privileges must conform to constitutional limitations, including fundamental rights.
- **Raja Ram Pal v. Speaker (2007):** Parliamentary privileges are subject to judicial review and must align with constitutional principles, including rights under Articles 20–21.
- **Article 19(1)(a):** While MPs enjoy freedom of speech in Parliament (**Article 105(1)**), this privilege does not extend to overriding citizens' free speech rights under Article 19(1)(a).

Q17. D

- **Statement a is not correct**: **Article 124(7) of the Constitution** states that a retired Supreme Court judge **cannot plead or act in any court or before any authority in India**. **However, there is no exception for arbitral tribunals.** The prohibition is absolute. Retired judges **can be appointed to commissions, tribunals, or act as arbitrators in private disputes**, but **not as advocates in courts.**
- **Statement b is not correct**: **Article 138 of the Constitution** allows **Parliament to expand the jurisdiction of the Supreme Court. Article 139** also enables Parliament to extend the **writ jurisdiction of the Supreme Court beyond fundamental rights**. Parliament **cannot take away the Supreme Court's core powers**, but it **can regulate or modify its jurisdiction** in certain matters.
- **Statement c is not correct**: As per **Article 125(1) of the Constitution**, the **salaries, allowances, and pensions of Supreme Court judges are determined by Parliament, not the President.** The President only **executes** these provisions, but **cannot unilaterally determine them.**
- **Statement d is correct**: **Article 124(4) and (5) of the Constitution** specify that a Supreme Court judge can be removed only on grounds of **"proved misbehaviour" or "incapacity."** The **removal process follows the Judges (Inquiry) Act, 1968** and requires:

    1. A **motion passed by a special majority** in both Houses of Parliament.
    2. Presidential assent for the final removal.

Q18. B

Statement I is correct: **India follows a quasi-federal structure**, where states have legislative powers, but these are subject to significant **limitations due to the central authority's overriding power**. **Legislative Autonomy of States is limited** because:

- **Parliament can legislate on State List subjects** under certain conditions (Article 249, Article 252, Article 253).
- **Governor's Assent and President's Approval** are required for certain bills.
- **Parliament has residuary powers** (Article 248) and can legislate on new matters.
- **During an emergency**, Parliament gains full control over state legislation (Article 250).

Executive Autonomy is relatively broader, as states have their own **Chief Minister, Council of Ministers, and administration**, though **the Governor (a central nominee) has discretionary powers.**

Statement II is correct: **Article 200:** When a bill is passed by a State Legislature, it is sent to the **Governor**, who can:

- **Give assent** and make it a law.
- **Withhold assent** (veto power).
- **Return it for reconsideration** (except Money Bills).
- **Reserve the Bill for the President's consideration.**

Article 201: If a **bill is reserved for the President's assent**, the President can:

- **Give or withhold assent**.
- **Return it to the State Legislature for reconsideration.**

This restricts the legislative autonomy of the states, but it does not directly relate to the comparison between legislative and executive autonomy.

Both statements are individually correct, but **Statement II does not directly explain Statement I**. Article 200 and 201 **affect state legislative powers**, but **legislative autonomy is also limited due to other factors** (e.g., Parliament's overriding authority, emergency provisions, etc.). **hence option b is correct answer.**

Q19. B

- **Statement a is not correct**: The opposition **does not have the power to block government policies outright** unless it can defeat the government in a vote of no confidence.
- **Statement b is correct**: **Parliamentary democracy operates on majority rule**, meaning the **government, having won the mandate, has the authority to implement policies** (i.e., "government should have their way"). **However, democracy also requires accountability**, and the **opposition plays a key role in scrutinizing government actions, questioning policies, and suggesting alternatives** (i.e., "opposition should have their say").
- **Statement c is not correct**: The government **does not require opposition approval to pass laws**; it only needs a **majority vote** in Parliament.
- **Statement d is not correct**: While public opinion influences policies, the **opposition cannot directly stop legislation** if the government has enough votes.

Q20. A

The **11th Schedule of the Indian Constitution**, added by the **73rd Constitutional Amendment Act, 1992**, lists **29 functional items** that **fall under the jurisdiction of Panchayati Raj Institutions (PRIs)**.

- **Markets and Fairs (Entry 22)**: **Markets and fairs** are explicitly mentioned in the **11th Schedule**.
- **Animal Husbandry, Dairying, and Poultry (Entry 4)**: **Animal husbandry, dairying, and poultry** are directly listed under the **11th Schedule**.
- **Libraries** (**Entry 17)**: **Education, including primary and secondary schools** (Libraries fall under this category).

While,

- **Fire Services:** Fire services are primarily a **municipal function** under the **12th Schedule**, which deals with urban local bodies.
- **Slum Improvement and Upgradation:** This is also part of **urban governance**, hence covered under the **12th Schedule** (related to municipalities).
- **Regulation of Slaughterhouses and Tanneries:** These are functions of **urban local bodies**, listed in the **12th Schedule**.

Q21. B

- **Species evenness** refers to **how evenly individuals are distributed among species in an ecosystem**.
- **Forest A has low species evenness** because a few species dominate, meaning **some species are overrepresented while others are rare**.
- **Forest B has high species evenness** because **all species have nearly equal numbers of individuals**, making the ecosystem **more balanced** in terms of population distribution.

Q22. A

- **Option a is correct**: The **Indo-Malayan realm shares faunal similarities with both the Palearctic (north) and Australasian (southeast) realms** due to **past geological and climatic events**. **Land bridges during glacial periods** facilitated **species exchange** with the Palearctic in the north and the Australasian realm in the southeast (e.g., Wallacea, a transition zone between Indo-Malayan and Australasian fauna).

Hence, **historical land connections (such as the Sunda Shelf and the Sahul Shelf)** enabled species dispersal, influencing evolutionary patterns.

- **Option b is not correct**: Climatic **uniformity does not fully explain species migration**, as significant **barriers like Wallace's Line** separate the Indo-Malayan and Australasian realms.
- **Option c is not correct**: While human activities have introduced species, the **faunal similarities predate colonial trade**, pointing to natural historical connections.
- **Option d is not correct**: Plate tectonics **did not cause direct contact** between the Indo-Malayan and Australasian realms **during the Holocene**; rather, **land bridges existed during earlier glacial periods**.

Q23. C

following are classified as 'Critically Endangered' by the International Union for Conservation of Nature (IUCN):

- Jenkin's Andaman Spiny Shrew (Crocidura jenkinsi)
  - Status: Critically Endangered
  - Details: Endemic to South Andaman Island in India.
- Malabar Civet (Viverra civettina)
  - Status: Critically Endangered
  - Details: Listed as 'Critically Endangered' on the IUCN Red List.
- Spoon-billed Sandpiper (Calidris pygmaea)
  - Status: Critically Endangered
  - Details: The species has an extremely small population, leading to its classification.
- Hawksbill Sea Turtle (Eretmochelys imbricata)
  - Status: Critically Endangered
  - Details: Faces threats from habitat loss and illegal hunting.
- Kondana Rat (Millardia kondana)
  - Status: Critically Endangered
  - Details: Nocturnal and burrowing rodent found only in India.

While,

- Ceylon Frogmouth (Batrachostomus moniliger)
  - Status: Least Concern
  - Details: Found in the Western Ghats of India and Sri Lanka.

Q24. C

- **Statement I is correct**: The Meghalaya plateau **does** have an **abundance of insectivorous plants**, such as **Nepenthes khasiana (pitcher plant)**, due to **nutrient-deficient soils**.
- **Statement II is incorrect**: Instead of **organic matter accumulation**, heavy rainfall causes **leaching of nutrients like nitrogen and phosphorus**, making the soil **poor in essential minerals** rather than **excessively rich**.

Hence option c is correct answer.

Q25. B

National Board for Wildlife (NBWL)
India's apex statutory body for wildlife conservation, established under the **Wildlife Protection Act, 1972** (via a 2002 amendment). Constituted in 2003, it replaced the Indian Board for Wildlife and operates under the Ministry of Environment, Forests and Climate Change (MoEFCC). **Hence statement 1 is not correct.**

Composition

- **Chairperson**: Prime Minister of India.
- **Vice-Chairperson**: Union Minister of Environment, Forests and Climate Change.
- **Members**: 47 members including MPs, state chief ministers, NGOs, ecologists, and government officials.
    - 3 MPs (2 Lok Sabha, 1 Rajya Sabha). **Hence statement 2 is not correct.**
    - 10 eminent ecologists/conservationists.
    - 5 NGO representatives.

Key Functions

- **Advisory role**: Guides central/state governments on wildlife policies, conservation programs, and legal frameworks.
- **Project approvals**: Grants/rejects clearances for infrastructure projects (e.g., dams, highways) within 10 km of protected areas.
- **Legal mandates**:
    - Approves boundary changes of national parks/sanctuaries.
    - Regulates habitat diversion (Section 29 of WLPA) and denotification of Tiger Reserves.
    - Prohibits commercial lodges/hotels in protected areas without prior approval.

Standing Committee

- **Chairperson**: Union Environment Minister.
- **Members**: Up to 10 members nominated by the Vice-Chairperson.
- **Role**: Reviews project proposals, ensures compliance with WLPA, and meets quarterly. Decisions are recommendatory but often binding unless overruled by MoEFCC.

Legal Provisions

- **Section 5A**: Establishes NBWL as a statutory body.
- **Section 35(5)**: Prohibits boundary changes of national parks without NBWL approval. **Hence statement 3 is correct.**
- **Section 38-O**: Restricts ecologically unsustainable projects in Tiger Reserves.

Significance

Critical for balancing development and conservation, especially in ecologically sensitive zones. Plays a pivotal role in enforcing India's commitments under international conventions like CITES.

Q26. A

- **Option a is correct**: **In-situ conservation** occurs **within natural ecosystems**, preserving biodiversity **along with ecological interactions** such as predator-prey dynamics, competition, and pollination. **Ex-situ conservation**, such as **zoos and gene banks**, removes species from their natural environment, preventing them from adapting to evolutionary pressures.
- **Option b is not correct**: **seed banks and captive breeding** are forms of **ex-situ conservation**, not in-situ.
- **Option c is not correct**: **in-situ conservation preserves natural habitats rather than modifying them**.

- **Option d is not correct**: ex-situ methods do **not allow natural evolution** as species are removed from their ecosystem.

Q27. A

- **Statement I is correct**: **Coal power plants** emit **carbon dioxide (CO_2), sulfur dioxide (SO_2), and particulate matter**, which cause air pollution and acid rain, but their direct contribution to global warming **per unit of gas emitted** is lower than SF_6.
- **Statement II is correct: Sulfur Hexafluoride (SF_6)** is a gas used in **high-voltage circuit breakers** and electrical insulation. **SF_6 has a global warming potential (GWP) that is approximately 23,500 times greater than CO_2** over a 100-year period. Since **SF_6 remains in the atmosphere for over 3,200 years**, its contribution to climate change can **exceed that of CO_2 emissions from coal plants**, justifying why circuit breaker manufacturing industries can have a more **severe long-term environmental impact**. **Hence option a is correct answer.**

Q28. B

- **Option a is not correct**: PSCs do not trap ozone; they trigger chemical reactions that deplete it.
- **Option b is corre**ct: **Polar Stratospheric Clouds (PSCs)** form in the **extremely cold temperatures of the polar regions** (mainly Antarctica and the Arctic). These clouds provide a **surface for chemical reactions** that convert **inactive chlorine and bromine-containing compounds (like HCl and $ClONO_2$) into highly reactive chlorine (Cl) and bromine (Br) radicals**. Once sunlight returns to the polar regions after winter, these **reactive chlorine and bromine radicals rapidly break down ozone (O_3) molecules**, leading to the formation of the **ozone hole**.
- **Option c is not correct**: PSCs do not reflect UV radiation in a way that affects ozone formation.
- **Option d is not correct**: PSCs do not release greenhouse gases; rather, they form in extremely cold temperatures.

Q29. A

Background

- The scheme was launched by the Hon'ble Minister of Power in May 2006 and is currently invoked for 30 appliances/equipment. The scheme intends to reduce appliance energy consumption without diminishing the services it provides to consumers.

Star Labelled Appliances

- The key objective of this program is to provide the consumer with an informed choice about energy saving and thereby the cost-saving potential of the relevant marketed appliance.
- The program was launched in 2006 and is presently invoked for 34 equipment/appliance.
- The first 11 appliances have been notified under mandatory labeling while the others are presently under the voluntary labeling phase.
- The energy efficiency labeling programs under BEE are intended to reduce the energy consumption of appliance without diminishing the services it provides to consumers.
- To facilitate, detailed information about the implementation of the S&L Programme, BEE has launched a comprehensive operation manual titled DISHA (DIsseminating Star Labelling in Household Appliance). The manual is available on BEE Star Label portal

Among the listed devices/appliances, **four** come under the **mandatory labelling** of BEE's Star Labelled Appliances Programme:

1. **Colour Television**
2. **Tubular Fluorescent Lamps**
3. **Distribution Transformer**
4. **Ceiling Fan**

Other appliances:

- **Washing Machine**: Voluntary phase
- **Diesel Generator Set**: Voluntary phase
- **Deep Freezers**: Initially voluntary (2020–2021), but **not listed in mandatory notifications** as per current BEE data

Q30. A

	Conference of Parties	***Places***	***Outcomes***
1	COP3	Kyoto, Japan	First legally binding emissions targets for developed nations
2	COP15	Copenhagen, Denmark	Recognized the 2°C warming limit
3	COP16	Cancún, Mexico	Established the Green Climate Fund (GCF)
4	COP27	Sharm El-Sheikh, Egypt	Loss & Damage Fund established

Q31. B

	Gupta Rulers	***Associated incriptions***
1	Samudragupta	Allahabad Stone Pillar; Eran Stone Pillar; Nalanda Copper Plate; Gaya Copper Plate
2	Chandragupta II	Mehrauli Iron Pillar
3	Skandagupta	Junagarh Rock; Bhitari Pillar; Indore Copper-plate Inscription
4	Buddhagupta	Paharpur Copper Plate

Q32. B

TAXILA Vs NALANDA

- Both Nalanda and Taxila universities were renowned ancient institutions of higher learning. However, while Nalanda was a formal university in the modern sense of the word, Taxila functioned under more informal conditions.
- Nalanda had almost all the infrastructure we associate with a good university in today's time, namely, multiple classrooms, extensive library, dormitories for students, accommodation for professors, etc.
- On the other hand, Taxila University did not have any lecture halls nor did it provide residential quarters for its teachers or students.
- There was no centralized system of schooling or syllabus in Taxila.
- **Taxila followed no system of examinations, and did not award degrees to its students. The education system there was flexible, and was modified according to a student's capabilities.**

- Also, the teachers of Taxila worked with complete autonomy, forming their own school of learning with their specific set of rules and manner of functioning.
- Most of these schools were run by teachers in their private houses, and received no formal infrastructural support from the Taxila University, unlike Nalanda.
- As far as the objective of imparting knowledge is concerned, both Taxila and Nalanda universities were very effective institutions, but their manner of functioning differed drastically, with Nalanda University being more structured than Taxila.

Q33. C

Mihirakula:

Mihirakula was one of the most infamous rulers of the **Alchon Huns**, a branch of the **Huna Empire** that invaded India during the **5th–6th centuries CE**. He was the successor of **Toramana**, another prominent Huna ruler. His reign is often associated with extreme cruelty, religious persecution (especially against Buddhists), and conflicts with contemporary Indian kingdoms.

Sources Mentioning Mihirakula

Mihirakula is referenced in several ancient texts, including:

1. **Rajatarangini (by Kalhana)** – A 12th-century historical chronicle from Kashmir, which portrays Mihirakula as a ruthless and violent ruler who destroyed Buddhist monasteries and persecuted monks.
2. **Xuanzang's Accounts** – The Chinese Buddhist traveler described Mihirakula as a brutal tyrant responsible for massive destruction.
3. **Gwalior and Mandsaur Inscriptions** – These inscriptions provide historical records of the Huna invasions and Mihirakula's rule.

Mihirakula's Rule and Atrocities

- Mihirakula ruled **Northwestern India**, particularly over **Punjab, Kashmir, and parts of Central India**.
- He is known for his hatred of Buddhism, as he destroyed **monasteries and Buddhist centers**, leading to a significant decline of Buddhism in certain regions.
- Under his rule, the Huna army committed mass **killings, looting, and destruction**, earning him a reputation as one of the most feared rulers of his time.

Q34. D

SITTANAVASAL CAVE PAINTINGS

- Sittanavasal, near Pudukkottai in Tamil Nadu is renowned primarily for its rock-cut cave temple with its rare Jaina mural paintings.
- The cave floor, in fact, provides slightly elevated beds and pillows carved out of rock, for use of the monks.
- There are about 17 beds, rectangular even-spaces; each with a sort of stone pillow.
- It is likely that on these rock beds the Jain ascetics performed austerities such askayotsarga and sallekhana (voluntary starvation leading to death).
- They represent one of the best cave paintings of early medieval India. These are example of rock-cut architecture based on Jain thought and ideologies.
- They have a close form of Ajanta and Bagh caves.

- The importance accorded to Sittanavasal is not because of its size or grandeur, but because of its significance in the history of development of Indian art and also because of its exquisite style of depiction, as evidenced by the fragments of its remnant murals.
- The Sittanavasal paintings are regarded as a surviving link between the Ajanta paintings (6th century) and the Chola paintings of Thanjavur (11th century).
- They are also classified with the Sigiriya (Srigiri) frescoes of Sri Lanka (5th century) and the Bagh frescoes in Madhya Pradesh (sixth and seventh centuries).

Q35. A

	Texts/literatures	***Authors***
1	Candikasataka	Banabhata
2	Suryashataka	Mayurabhatta
3	Janaki Haran	Kumardas
4	Nagananda	Harshavardhana

Q36. B

- **Statement 1 is not correct**: While Hemu initially served under Islam Shah Suri (Sher Shah Suri's son), he rose to prominence as the chief minister and general of Muhammad Adil Shah, the last significant Sur ruler. Hemu led the Afghan forces against Akbar in the Second Battle of Panipat (1556) under Muhammad Adil Shah's nominal authority.
- **Statement 2 is correct**: Pir Muhammad Khan, Bairam Khan's son-in-law, was notorious for his arrogance and misrule, which alienated the nobility and provoked Akbar's courtiers (like Maham Anga) to push for Bairam Khan's dismissal. This led to Bairam Khan's short-lived rebellion in 1560.
- **Statement 3 is not correct**: The Kachchhawahas of Amber (Jaipur) were the first Rajput clan to ally with Akbar (1562), when Raja Bharmal married his daughter to the emperor. The Hadas of Bundi submitted later, after military engagements.

Q37. A

- **Statement 1 is not correct**: The **Harkaras** were **spies or intelligence officers** in the Mughal administration. They were not involved in enforcing public morals or religious affairs but played a crucial role in gathering information for the emperor.
- **Statement 2 is correct**: **Tanab** was a standard **land measuring tool** used during the Mughal period for surveying and revenue assessment. It was an essential part of **Todar Mal's revenue system**, which introduced systematic land measurement under **Akbar**.
- **Statement 3 is not correct**: **'Shahrukhi'** was not a script but a **coin** issued during the Mughal period. The religious doctrine of **'Din-e-Ilahi'** was not written in any specific script, as it was a **philosophical concept introduced by Akbar**, blending elements of different religions.

Q38. A

Structures inside Fatehpur Sikri Complex:

- **Jama Masjid** – A grand mosque built by Akbar inside Fatehpur Sikri.
- **Tomb of Salim Chishti** – The white marble tomb of Sufi saint Salim Chishti, located inside the mosque courtyard.
- **Jamat Khana** – A prayer hall used by followers of Salim Chishti.

- **Panch Mahal** – A five-story palace built as a retreat for the royal women.

Structures outside Fatehpur Sikri Complex:

- **Tomb of Itmad-ud-Daulah** – Located in **Agra**, built by Nur Jahan for her father.
- **Deeg Palace** – Located in **Rajasthan**, built by the Jat rulers of Bharatpur.

Q39. C

	Rulers	***Court Poets***
1	Deva Raya I	Madhura
2	Deva Raya II	Gunda Dimdima, Srinatha, Chamarasa, Kumara Vyasa
3	Krishna Deva Raya	Pingali Suranna, Allasani Peddanna
4	Achyuta Deva Raya	Chatu Vittalanatha

Q40. A

- **Statement 1 is correct**: Ramchandra Pant Amatya, a key administrator under Shivaji and later rulers, wrote 'Adnyapatra', a war and administration treaty that guided the Maratha governance system.
- **Statement 2 is not correct**: The term **'Hindu-pad Padshahi'** was **not popularized by Sambhaji**, but rather by **Peshwa Baji Rao I** and later **his son Balaji Baji Rao (Nana Saheb)**. The idea behind this was the **establishment of Hindu rule across India**, which became a political aspiration of the Marathas.
- **Statement 3 is not correct**: The **Third Battle of Panipat (1761)** was fought under the leadership of **Peshwa Balaji Baji Rao (Nana Saheb)**, not **Madhav Rao**. **Sadashivrao Bhau** led the Maratha army in battle against **Ahmad Shah Abdali**. **Peshwa Madhav Rao I** came to power after this battle but did not lead it.

Q41. D

- **Statement 1 is correct**: Regulation XVII was enacted by Lord William Bentinck on December 4, 1829, abolishing the practice of Sati (widow immolation) in British India. Supported by reformers like Raja Ram Mohan Roy, it declared Sati illegal and punishable by courts.
- **Statement 2 is correct**: *Act XXIV of 1843* provided the legal framework to eradicate Thuggee (ritual strangulation by Thugs) and Dacoity (armed robbery). William Sleeman spearheaded its enforcement, leading to the dismantling of Thug networks by the 1850s.
- **Statement 3 is corre**ct: **Act V of 1843**, passed under **Governor-General Lord Ellenborough**, officially **declared slavery illegal** in British India. It prohibited the sale and enslavement of individuals.

Q42. B

- **Statement 1 is not correct**: Maharshi Vitthal Ramji Shinde (1873–1944) was born in a Marathi family in Karnataka. He was influenced in his spiritual journey by the works of Tukaram, Eknath, and Ramdas. Shinde gave evidence before the Southborough Franchise Committee in 1919, and expressed the need for giving special representation to the untouchable class. He resigned as the executive of the Depressed Classes Mission when some of the members wanted the mission's affairs to be managed by their own people.
- **Statement 1 is not correct**: **Gopalhari Deshmukh** (pen name: *Lokahitawadi*) was a social reformer in Maharashtra. He did **not** start *Sudharak*; it was founded by **Gopal Ganesh Agarkar** (not Deshmukh).

- **Statement 3 is correct**: **Shiv Narayan Agnihotri**, leader of the **Dev Samaj** (founded 1887), compiled *Deva Shastra* (1905), which outlined ethical principles such as rejecting bribes, intoxicants, and non-vegetarian food. The text emphasized moral discipline and social reform

Q43. D

	Delhi Durbars	***Viceroyships***	***Related events***
1	First Delhi Durbar in 1877	Lord Lytton	Proclamation of Queen Victoria as the Empress of India
2	Second Delhi Durbar in 1903	Lord Curzon	Coronation of King Edward VII as the Emperor of India
3	Third Delhi Durbar in 1911	Lord Hardinge II	Coronation of King George V and Queen Mary

Q44. B

The **Delhi Proposals of 1927** were put forward by the **Muslim League** under **Jinnah's leadership** as an attempt to reconcile differences between Hindus and Muslims before the **Simon Commission's arrival**. The proposals included:

1. **Joint electorates** in place of separate electorates, but **with reserved seats for Muslims**.
2. **One-third representation for Muslims** in the **Central Legislative Assembly**.
3. **Formation of three new Muslim-majority provinces**: **Sindh, Balochistan, and North-West Frontier Province (NWFP)** as separate entities.

While,

1. **Linguistic provinces** were not part of the Delhi Proposals; they were mainly part of later discussions in the **Nehru Report (1928)**.
2. **Complete dissociation of State from religion** was **not** a demand in the Delhi Proposals; it was later emphasized in **Jinnah's 14 Points (1929), and also included into Nehru Report (1928)**.

Q45. C

Smuts-Gandhi Agreement (1914)
A landmark settlement between **Mahatma Gandhi** and **General Jan Smuts** that resolved a decade-long struggle for Indian rights in South Africa, culminating in the **Indian Relief Act** of 1914.

Background

- **Indian Indentured Labor**: Tens of thousands of Indians migrated to South Africa (1860 onwards) as indentured labourers, facing systemic discrimination.
- **Anti-Indian Laws**:
    - **£3 Poll Tax**: Imposed on ex-indentured labourers after their contracts ended.
    - **Asiatic Registration Act (1906)**: Required Indians to carry registration certificates (the "Black Act"), sparking Gandhi's **Satyagraha** (nonviolent resistance).

Key Provisions of the Agreement

1. **Abolition of the £3 Poll Tax**: Removed the financial burden on ex-indentured labourers.
2. **Recognition of Indian Marriages**: Legally validated marriages conducted under Hindu, Muslim, and other Indian customs.
3. **Domicile Certificates**: Allowed wives and children of settled Indians to enter South Africa.
4. **Voluntary Registration**: Ended compulsory fingerprinting under the Black Act.

Significance

- **End of Satyagraha**: Marked Gandhi's first major success with nonviolent resistance, shaping his future campaigns in India.
- **Legislative Impact**: The **Indian Relief Act (June 1914)** formalized these provisions.
- **Mutual Respect**: Despite initial hostility, Gandhi and Smuts developed a grudging admiration, with Smuts later calling Gandhi a "saint".

Limitations

- **Partial Victory**: Did not address broader political rights (e.g., voting) or land ownership restrictions.
- **Continued Discrimination**: Segregation laws persisted, and the "Indian Question" remained unresolved in South Africa's racial hierarchy.

Aftermath

- **Gandhi's Departure**: He left South Africa in July 1914, believing the agreement fulfilled immediate demands.
- **Legacy**: The pact became a blueprint for future civil rights movements, emphasizing negotiation and moral persuasion.

Q46. B

- **Natural landscapes like forests and grasslands** have a relatively **higher albedo** compared to **dark surfaces like asphalt and concrete**.
- **When green areas are replaced by roads and buildings**, the **overall albedo decreases**, meaning **more heat is absorbed**, leading to **higher temperatures**.
- This contributes to the **urban heat island (UHI) effect**, where **cities become significantly warmer** than surrounding rural areas.
- **Option (b) correctly describes this phenomenon**, as lower albedo leads to increased heat absorption, intensifying the **local warming effect** in urban areas.

Q47. A

- **Air masses** are large bodies of air with uniform temperature and humidity, which influence regional weather patterns.
- **Continental Polar (cP) air masses** originate from cold, dry land regions such as **Siberia and Central Asia**.
- When a **cP air mass moves southward into Northern India**, it brings **cold, dry conditions**, often causing **cold waves** with clear skies.
- **Option (a) is correct** because a cP air mass explains the sudden drop in temperature and dryness observed during such events.

Q48. A

	Ocean Reliefs	*Examples*	*Related Oceans*
1	Submarine Canyon	Monterey Bay, Hudson Canyon	Pacific Ocean, Atlantic Ocean
2	Abyssal Plain	Aleutian Plain, Sohm Plain	Pacific Ocean, **Atlantic Ocean**
3	Continental Shelf	Grand Banks, **Sunda Shelf**	Atlantic Ocean, Indian Ocean
4	Guyots	Great Meteor Table mount	Atlantic Ocean

Q49. A

- **Statement I is correct**: The MJO's eastward-propagating convection can trigger westerly wind bursts (WWBs) in the western Pacific, which weaken trade winds and promote El Niño onset by initiating downwelling Kelvin waves (warm water accumulation in the eastern Pacific). Conversely, MJO-induced easterly anomalies during El Niño's decay phase (e.g., 1998) can accelerate its termination
- **Statement II is correct**: MJO alters trade wind strength and Walker Circulation by modulating atmospheric convection patterns. For example:
    - El Niño: MJO convection shifts eastward, weakening trade winds and reducing upwelling, amplifying SST warming.
    - La Niña: MJO's Pacific convection weakens, strengthening trade winds and cooling SSTs
- Statement-II directly explains Statement-I as MJO's modulation of trade winds (via wind bursts) and SST anomalies (via altered Walker Circulation) creates conditions for ENSO initiation or termination.

Hence option a is correct.

Q50. B

	Accidents	*Causes*
1	Chasnala Mining Disaster (1975)	Flooding of mine
2	Vizag Gas Leak (2020)	Leakage of Styrene gas
3	Mayapuri Incident (2010)	Improper disposal and handling of Cobalt-60
4	NTPC Power Plant Explosion (2017)	Failure in boiler operation

Q51. C

These Rivers flow entirely in one state:

1. **Paleru** – Flows entirely in **Telangana**.
2. **Shetrunji** – Flows entirely in **Gujarat**.
3. **Netravati** – Flows entirely in **Karnataka**.
4. **Bharathapuzha** – Flows entirely in **Kerala**.

5. **Vaigai** – Flows entirely in **Tamil Nadu**.

Q52. D

The lakes Wular, Renuka, Sambhar, Ansupa, and Nanda are **Ramsar Site Lakes**. Each of these lakes has been designated as a Ramsar site, recognizing their ecological importance under the Ramsar Convention on Wetlands:

- **Wular Lake**: A freshwater lake in Jammu & Kashmir, designated as a Ramsar site in 1990.
- **Renuka Lake**: A natural freshwater lake in Himachal Pradesh, designated as a Ramsar site in 2005.
- **Sambhar Lake**: India's largest saline lake in Rajasthan, designated as a Ramsar site in 1990.
- **Ansupa Lake**: A freshwater lake in Odisha, known for its biodiversity and ecological significance. Ramsar site in **2021.**
- **Nanda Lake**: Located in Goa, it is a Ramsar site with a mix of natural marshland and man-made features.

Q53. C

- **Statement I is correct**: A **positive IOD** enhances the Indian monsoon by increasing the difference in sea surface temperatures. The warmer western Indian Ocean draws moist winds toward India, leading to **stronger rainfall**. Conversely, a **negative IOD** can weaken the monsoon.
- **Statement II is incorrect**: In a **positive IOD**, the **eastern Indian Ocean (near Indonesia)** actually becomes **cooler** than normal. The **western Indian Ocean** (near the coast of East Africa) becomes **warmer**.

Hence option c is correct answer.

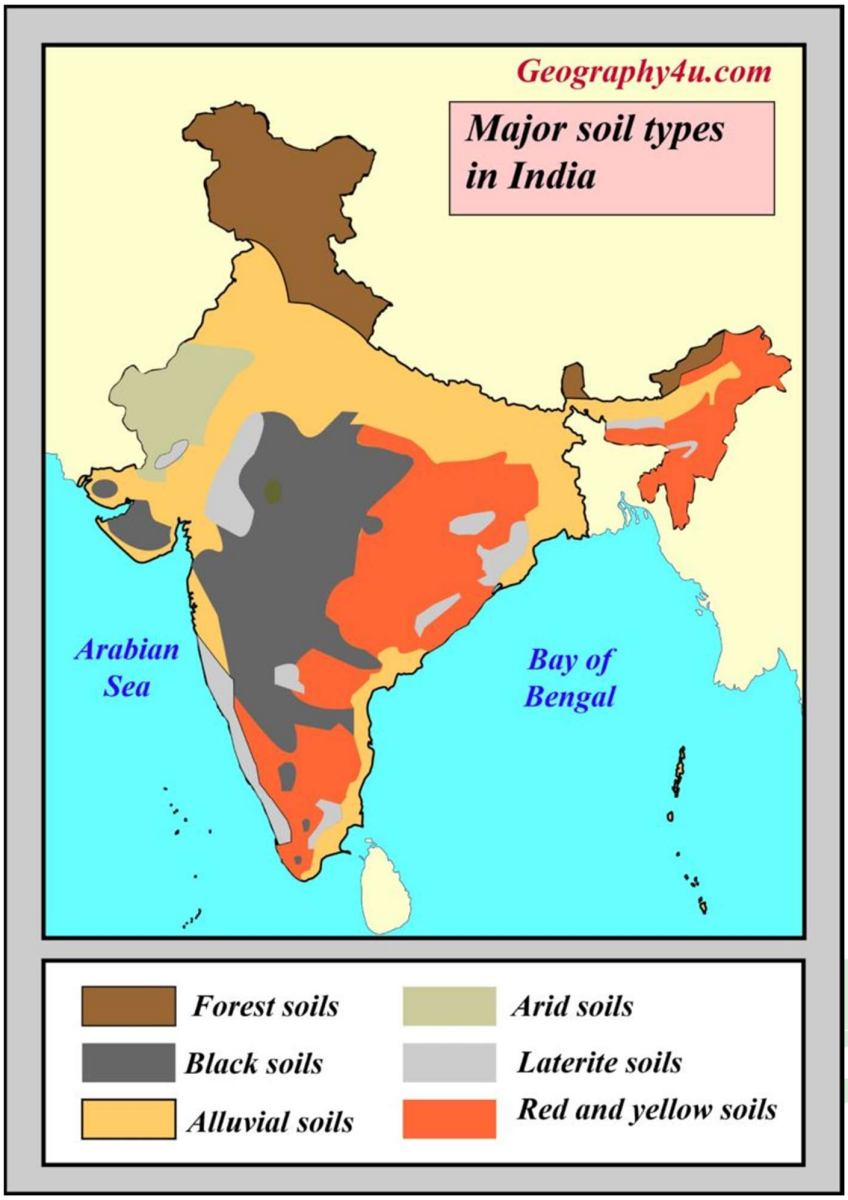
Q54. C

Laterite soils are primarily found in regions with **high rainfall and tropical climates**, leading to intense leaching and enrichment in iron & aluminium oxides. The major Indian states where these soils are predominant include:

1. **Maharashtra** (Western Ghats, Konkan coast)
2. **Kerala** (Widespread in midlands and highlands)
3. **Tamil Nadu** (Parts of the Eastern Ghats and Nilgiris)
4. **Madhya Pradesh** (Balaghat, Chhindwara, and other eastern districts)

While,

- **Jharkhand**: While it has some lateritic patches, the dominant soils are **red and forest soils**.
- **Rajasthan**: Mostly has **arid and desert soils**, not laterite.



Q55. C

- **Sundari** – Dominant tree in **Sundarbans Mangrove Forests**; the forest is actually named after this tree.
- **Rhizophora** – A classic **mangrove genus** with stilt roots, found in coastal saline ecosystems.
- **Indian Oak (Barringtonia)** – Found in **swampy and waterlogged areas**, common in mangrove-adjacent swamps.
- **Myristica fatua** – Found in **Myristica swamps**—a unique type of **freshwater swamp forest** in the Western Ghats (Kerala, Karnataka).

All of these species are associated with **mangrove and swamp ecosystems**, characterized by **waterlogged soils, saline or freshwater influence, and high humidity**.

Q56. B

Boreal Forests (Taiga):

Boreal forests, also known as **Taiga**, form the **world's largest terrestrial biome**, stretching across vast areas of **Canada, Russia, Alaska**, and **Scandinavia**. These forests lie just south of the Arctic tundra and play a crucial role in regulating Earth's climate and storing carbon.

Climate Characteristics:

- **Long, harsh winters** (up to 6–8 months)
- **Short, mild summers**
- Temperatures can drop below **-40°C** in winter.
- Moderate to low annual precipitation: **20–75 cm**, mostly as snow.

Vegetation:

Dominated by **coniferous trees**, which are well adapted to cold and poor soils.

Major tree species:

- **Spruce**
- **Fir**
- **Pine**
- **Larch (a deciduous conifer)**

These trees:

- Have **needle-like leaves** to reduce water loss
- Are **evergreen**, allowing photosynthesis early in spring
- Grow closely together, forming **dense canopies**

Wildlife:

Animals in boreal forests are adapted to cold and seasonal scarcity of food.

Common species:

- **Moose**
- **Lynx**
- **Snowshoe hare**
- **Wolverine**
- **Bears (e.g., grizzly, black)**
- **Migratory birds** in summer

Soil and Ecology:

- Soils are **acidic and nutrient-poor** due to slow decomposition.
- Known as **spodosols** with a thick layer of **leaf litter and needles**.
- Low biodiversity compared to tropical forests but **high in biomass**.

Q57. D

The passage describes the **Konyak** tribe of Nagaland. Key identifiers include:

- **Elaborate body tattoos** (distinctive among Naga tribes, particularly noted in Konyak culture).
- **Traditional beadwork and feathered headgear** (shawls adorned with beads, shells, and headdresses with hornbill feathers/boar tusks).
- **Strong warrior heritage** (historical headhunting practices and skull trophies).
- **Hilltop villages with bamboo/thatch homes** (common in Nagaland's Mon district).
- **Tibeto-Burman language** (spoken by Naga ethnic groups).
- **Vibrant harvest festivals** (*Aoleang* with log drums, feasts, and ceremonial attire).

Other options:

- **Lepcha**: Primarily in Sikkim/parts of Nepal, not associated with headhunting or Naga cultural markers.
- **Denzongpa**: A term for Sikkimese people, unrelated to the described practices.
- **Gurung**: A Nepali community known for Gurkha military traditions, not headhunting or Naga festivals.

Q58. B

- **Statement a is correct**: **Conurbation** is a large urban area formed by the merging of multiple towns and cities into one continuous built-up zone.
- **Statement b is not correct**: The term **"conurbation"** was coined by **Patrick Geddes**, a Scottish urban planner—not Ebenezer Howard. Howard is associated with the **Garden City Movement**, which aimed to limit urban sprawl—not encourage it.
- **Statement c is correct**: Conurbations often grow around **ports, industrial clusters, and transport corridors**, where economic gravity pulls nearby towns into a single urban system.
- **Statement d is correct**: The **Mumbai–Pune–Nashik** and **Delhi–Gurugram–Noida–Ghaziabad** regions are examples of **emerging conurbations in India**, due to expanding metropolitan areas and functional integration.

Q59. A

- India has developed **Strategic Petroleum Reserves (SPR)** as a buffer against disruptions in oil supply.

- The key locations include:
    - **Visakhapatnam** (Andhra Pradesh)
    - **Mangaluru** (Karnataka)
    - **Padur** (Karnataka)
    - **Chandikhol** (Odisha – under development in Phase II)

These facilities are **underground rock caverns** managed by the **Indian Strategic Petroleum Reserves Ltd. (ISPRL)**.

Q60. C

These mines are among the **largest and most productive copper mines** in the world:

- **Escondida Mine** – Located in **Chile**, it's the **world's largest copper mine** by production.
- **Grasberg Mine** – Located in **Indonesia**, rich in **both copper and gold**, but copper is a primary product.
- **Morenci Mine** – Located in **Arizona, USA**, it's one of the **largest copper mines** in North America.
- **Kamoto Mine** – Located in the **Democratic Republic of the Congo**, it's a major source of **copper and cobalt**.

Q61. D

These terms are specific to the **Odissi dance** — one of the **eight classical dance forms** of India, originating from **Odisha**. Each term represents a distinct segment of a traditional Odissi performance:

- **Mangalacharan** – The **invocatory piece** where the dancer offers prayers to Lord Jagannath and seeks blessings.
- **Batu Nritya** – A **pure dance (nritta)** section that showcases intricate poses and body movements without any lyrics.
- **Pallavi** – A **graceful and lyrical elaboration**, where dance movements expand like a blossom in sync with melodic patterns.
- **Tharijham (also spelled as Moksha or Tarijham)** – The **concluding piece**, representing **spiritual liberation**, danced with devotion and expressiveness.

Q62. A

Jatra:

- Jatra is a popular folk theatre of Eastern India.
- It is generally an open-air performance that was initiated by Vaishnava Saint Chaitanya Mahaprabhu.
- During his travels through rural Bengal, he used the medium of Jatra to propagate the teachings of Lord Krishna.
- Later, variants such as Rama Jatra, Shiv Jatra and Chandi Jatra also came into existence that narrates stories of Puranic legends.
- In the modern times, Jatra was used to narrate stories of secular, historical and even patriotic themes.
- In Odisha, a popular form of street theatre known as Sahi Jatra is prevalent.

Q63. B

Apabhramsa

Apabhramsa (Sanskrit: *Apabhraṃśa*, "corrupt" or "non-grammatical") refers to a collection of transitional dialects that bridged Middle Indo-Aryan languages (Prakrits) and Modern Indo-Aryan languages. It played a pivotal role in India's linguistic evolution from Sanskrit to regional vernaculars.

Origins and Development

- **Etymology**: The term *Apabhraṃśa* ("fallen away" or "corrupt") was initially used pejoratively by grammarians like Patañjali (2nd century BCE) to describe deviations from Sanskrit norms.
- **Timeline**:
  - **Emergence**: Between 2nd century BCE–3rd century CE as Prakrit dialects evolved.
  - **Literary use**: Flourished from 5th–15th centuries CE, particularly in Jain and Buddhist texts.
  - **Decline**: Gradually replaced by early forms of Hindi, Gujarati, and other New Indo-Aryan languages by the 13th–15th centuries.

Linguistic Features

- **Structure**: Simplified Prakrit grammar with vernacular influences, serving as a linguistic "bridge".
- **Dialects**: Regional varieties like Qaurasena (precursor to Hindi), Maharashtri, and Magadhi.
- **Script**: Primarily written in Devanagari, with Jain manuscripts preserving significant works.

Literary Contributions

- **Jain texts**: Major works include *Paumacariu* by Svayambhudeva and compositions by Pushpadanta (9th century CE).
- **Secular and mystical poetry**: *Sandeśarāsaka* by Abdur Rahman (c. 1000 CE) and verses by tantric Buddhists like Saraha.
- **Later compositions**: Continued into the 18th century, e.g., *Migankaleha Chariu* by Bhagavatidasa.

Cultural Significance

- **Religious role**: Vital for Jain doctrinal texts and Buddhist tantric poetry.
- **Regional impact**: Shaped the development of languages such as:

- **Hindi** (via Qaurasena Apabhramsa).
- **Gujarati** and **Rajasthani** (through western dialects).

Key Figures

- **Hemachandra**: 12th-century Jain scholar who systematized Apabhramsa grammar.
- **Raidhu of Gwalior**: 15th-century poet known for blending Apabhramsa with early Hindi.

Legacy

Apabhramsa's evolution highlights India's linguistic diversity, serving as a critical link between classical Sanskrit and modern vernaculars. Its literature offers insights into medieval social, religious, and cultural practices.

Note: Dates for Apabhramsa's usage vary, with some scholars extending its literary period into the 18th century though most consider it transitional between 500–1300 CE.

Q64. C

All these works are central to the **Paninian grammatical tradition**, which is the **core framework of Sanskrit grammar**:

- **Mahabhasya** – Written by **Patanjali**, it is an authoritative **commentary on Panini's Ashtadhyayi**, incorporating **Katyayana's Vartikas** (explanatory notes).
- **Vartikas** – Authored by **Katyayana**, they are critical **supplements to Panini's sutras**, refining and critiquing them.
- **Siddhanta Kaumudi** – By **Bhattoji Dikshita**, this is a **reorganized and pedagogically structured** version of Panini's sutras for easier learning.
- **Brhacchabdendusekhara** – An **advanced treatise** dealing with **derivational grammar** and technical points of Paninian analysis, written in the **late classical period**.

Q65. D

	Achievements	*Awardees*
1	First Nobel Laurent to get Bharat Ratna	Dr. C.V Raman
2	First 'Posthumously' Bharat Ratna Awardee	Lal Bahadur Shastri
3	First Foreigner to get Bharat Ratna	Khan Abdul Ghaffar Khan
4	First Singer to receive Bharat Ratna	MS Subbulakshmi

Q66. C

Context: In December 2024, the first ever no confidence motion moved by the Opposition against the Vice President of India was rejected by the deputy chairman on the grounds that a 14-day notice was not given and Mr Dhankhar's name was not spelt correctly. H**ence statement 3 is correct.**

Process to Remove the Vice President of India.

About the removal process

- **Article 67 (b): It details the process to remove the Vice President from his/her office. Hence, Statement 1 is not correct.**
- The Vice President can be removed from his/her office before the completion of the term.
- The ***resolution for removal*** of Vice President can be ***introduced only in Rajya Sabha and not in Lok Sabha. Hence statement 2 is not correct.***
- No such resolution can be moved unless ***at least 14 days' advance notice*** has been given.
- This resolution must be passed by a ***majority of all the then members of the Rajya Sabha (Effective Majority)*** and ***agreed to by Lok Sabha by a Simple Majority.***
- ***Grounds for Removal:*** No grounds has been mentioned in the constitution for the removal of the Vice President of India.
- There is ***no precedence*** of a no-confidence resolution being moved against the Rajya Sabha Chairman. Though a ***no-confidence resolution*** was moved against the ***Rajya Sabha Deputy Chairman*** in 2020.

Q67. A

Context: ***The Opposition parties in the Rajya Sabha are gearing up to submit a motion for the impeachment of Allahabad High Court judge Justice Shekhar Kumar Yadav, following his controversial remarks made at a Vishwa Hindu Parishad (VHP) event.***

What is the Procedure for Removal of a Judge?

- **Constitutional provisions:** Under **Articles 124** and **217** of the Indian Constitution, a **Supreme Court** or **High Court judge** can be removed by the **President** on grounds of **'proved misbehaviour'** or **'incapacity'**. The motion must be passed in both Houses of Parliament:
    - By a **majority of the total membership** of the House, and
    - By a **two-thirds majority** of the members **present and voting** in the same session (special majority).
- The Constitution does **not define** the terms **'proved misbehaviour'** or **'incapacity'**. However, the **Supreme Court** has clarified through its judgments that actions such as **wilful misconduct**, **corruption**, **lack of integrity**, or offences involving **moral turpitude** constitute misbehaviour.
- **Incapacity** refers to a medical condition that includes **physical** or **mental limitations** preventing the judge from performing duties effectively.

Detailed Procedure Under the Judges (Inquiry) Act, 1968

The procedure for removal of judges is elaborated in the **Judges (Inquiry) Act, 1968**, which requires:

- A **motion for removal** is to be signed by **at least 50 members** in the **Rajya Sabha** or **100 members** in the **Lok Sabha**.
- The **Chairman of the Rajya Sabha** or the **Speaker of the Lok Sabha** has the discretion to **admit or reject** the motion after consultation.
- If admitted, a **three-member committee** is constituted, comprising:
    - A **Supreme Court Judge**,
    - A **High Court Judge**, and
    - A **distinguished jurist**.

- The committee investigates the allegations. If the judge is **cleared** of misconduct or incapacity, the motion is dropped and not pursued further.
- If the committee finds the judge **guilty** of misbehaviour or incapacity, the report is tabled in **both Houses of Parliament**, where the motion must be passed by a **special majority**.

Q68. A

Context: ***Recently, the Manipur government launched a review of the ILP system following violations, highlighting the importance of stringent implementation.***

About Inner Line Permit (ILP):

- **What it Is**: ILP is a travel document required by Indian citizens from outside certain states to enter and stay for a limited period in protected regions.
- **Origin**: Originated during the colonial era under the Bengal Eastern Frontier Regulation Act, 1873, to protect Crown interests.
- **Law governing:** Currently regulated under the Foreigners (Protected Areas) Order, 1958 for foreign tourists and state-specific ILP guidelines for Indian citizens.
- **States under ILP**: **Arunachal Pradesh, Nagaland, Mizoram, and Manipur.**
- **Departments involved**: The Home Department and the concerned state government oversee implementation.
- **Issuing authority**: ILP is issued by the respective state authorities.

Features:

- Mandatory for non-residents to enter designated states.
- Specifies a limited stay period. o Includes different categories, such as labour permits, regular permits, and tourist permits.
- Aims to preserve local cultural, demographic, and economic interests.

Q69. A

Context: ***The Union Minister of Education addressed the 20th Foundation Day of the National Commission for Minority Educational Institutions (NCMEI). He emphasized the rights of minorities under the Constitution.***

About National Commission for Minority Educational Institutions

- It was established by the National Commission for Minority Educational Institutions Act (NCMEI Act), 2004.
- **Mandate**– To safeguard and promote educational rights of religious and linguistic minorities as per *Article 30(1)* of the Constitution.
- **Nodal Ministry**– Ministry of Education **hence statement 2 is not correct.**
- **Powers and Functions:**
    - It is a *quasi-judicial body* endowed with the *powers of a Civil Court*. **Hence statement 1 is correct.**
    - It decides on questions regarding the status of an institution as a Minority Educational Institution (MEI).
    - It acts as an *appellate authority for disputes related to Minority Status* or No Objection Certificate (NOC).

- The Commission *can cancel the minority status of an institution* granted by an authority or commission based on the Act's provisions.
- It has powers to call for information while enquiring into the complaints of violation or deprivation of the educational rights of the minorities.
- As per Supreme court ruling the Commission has *both original as well as appellate jurisdiction*.
- No court (*except the Supreme Court and* ***a High Court*** exercising jurisdiction under articles 226 and 227 of the Constitution) shall entertain any suit, application or other proceedings in respect of any order made by the Commission. **Hence statement 3 is not correct.**

Q70. B

Context: ***Manipur is facing a potential imposition of President's Rule following the resignation of Chief Minister N. Biren Singh, as BJP struggles to find a consensus candidate.***

- **Statement 1 is correct**: The **first ever imposition of President's Rule** was in **1951** in the **Patiala and East Punjab States Union (PEPSU)** — a former princely union that later merged into **Punjab**.
- **Statement 2 is not correct**: **Manipur & Uttar Pradesh have seen the maximum number of impositions of president's rule in India (11 times each).**
- **Statement 3 is correct:** The **longest duration** of President's Rule was in **Jammu & Kashmir** — between **1990 to 1996**, lasting for **~6 years**. The **shortest** instance was in **Bihar in 1995**, lasting only **a few days** (7 days in 1995) before the assembly was dissolved and elections were called.

Q71. A

Context: ***The 55th GST Council Meeting, chaired by Finance Minister, introduced several revisions to the GST slabs for various items and services, impacting everyday commodities and specialized goods.***

Revised GST rates on certain items:

Sr no	Item Name	New GST Slab
1	Resale of Cars (Old & Used)	18%
2	Popcorn (Caramelized)	18%
3	Popcorn (Salted & Pre-Packed)	12%
4	Electric Vehicles	18% on Used EV Cars & 5% on new EV cars
5	Ethanol (Supplied to Refineries)	5%
6	Ready-to-Eat Pre-Packed Snacks	12%
7	Fortified Rice Kernels (FRK)	5%
8	Gene Therapy	Exempt
9	Bank Penalties	Exempt

Q72. B

Context: ***Ashtalakshmi 2024 showcased the North East region's rich heritage, highlighting its GI-tagged products, which reflect its unique cultural and agricultural traditions.***

	GI-tagged products	*Locations*	*Remarks*
1	Wakro Orange	Arunachal Pradesh	High nutritional value; cultivated using traditional farming methods.
2	Dalle Khursani	Sikkim	Fiery red chili; used in pickles,

			pastes; known for pungency and medicinal benefits.
3	Chak Hao Rice	Nagaland	Aromatic black rice; highlights agricultural diversity.
4	Joha Rice	Assam	Aromatic rice variety; reflects rich Assamese agricultural traditions.

Q73. C

Context: ***At a time when most other consumer segments are grappling with subdued growth, the beauty and cosmetics market remains on an upswing.***

The Lipstick effect:

- ***The lipstick effect in economics refers to a phenomenon where consumers tend to buy small, affordable luxury items, such as lipstick, during periods of economic downturn or financial uncertainty.*** This counterintuitive behaviour stems from the idea that while people may cut back on larger, more expensive purchases, they still seek small indulgences as a way to feel good or maintain a sense of normalcy during tough times.

Key Aspects of the Lipstick Effect:

1. **Psychological Comfort:**
    - ***Purchasing affordable luxuries provides emotional comfort without causing significant financial strain. It serves as a small morale booster during difficult economic periods.***
2. **Shifting Priorities:**
    - Consumers tend to reprioritize their spending, focusing on smaller treats rather than big-ticket items like vacations or cars.
3. **Economic Indicators:**
    - The effect is often seen as an indicator of economic uncertainty. An increase in the sales of items like lipsticks, perfumes, or gourmet coffee can hint at broader financial struggles.
4. **Historical Context:**
    - ***The term gained prominence during the Great Depression of the 1930s when despite widespread financial hardship, sales of inexpensive beauty products like lipstick remained stable or even grew.***
    - ***Leonard Lauder, the chairman of Estée Lauder,*** highlighted this effect after observing a spike in lipstick sales following the 2001 recession.
5. **Modern Examples:**
    - The 2008 financial crisis saw increased sales of small indulgences like lipsticks, chocolates, and specialty coffees, while spending on luxury cars and high-end electronics declined.

Why Lipstick?

- ***Lipstick, as a metaphor, represents affordable luxury—an item that allows consumers to feel pampered and maintain a sense of glamour or normalcy without significant expense. While it is called the lipstick effect, the principle applies broadly to various small luxury items.***
- This effect underscores the importance of consumer psychology in economics and demonstrates how emotional needs can influence purchasing behaviour, even in challenging financial environments.

Q74. A

Context: ***The Jevons Paradox has resurfaced in economic discussions after the DeepSeek AI launch led to a selloff in global tech stocks, raising concerns over AI chip demand.***

Jevons Paradox:

- The **Jevons Paradox** occurs when **technological advancements** that **increase the efficiency** of resource use **lead to an overall increase in consumption** of that resource, rather than a decrease.
- It was first proposed by **William Stanley Jevons**, a British economist, in **1865** in his work *"The Coal Question."*

Core Idea:

- "An increase in the efficiency with which a resource is used tends to increase (rather than decrease) the rate of consumption of that resource."

Historical Origin:

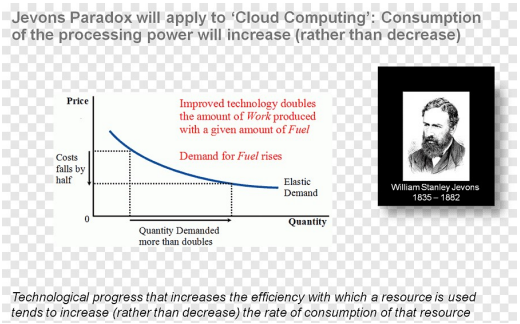
- Jevons observed that improvements in the **efficiency of steam engines** led to **more, not less, coal consumption**.
- This is because cheaper and more efficient energy **encouraged broader industrial usage**, expanding demand overall.

How It Works:

Efficiency Improves	→	**Lower Cost per Use**
Lower Cost per Use	→	More Usage
More Usage	→	Total Demand Increases

Examples in Modern Context:

1. **Fuel-Efficient Cars:**
   As cars become more fuel-efficient, people may drive more, offsetting the fuel savings.
2. **LED Lighting:**
   LEDs use less electricity, but households may keep lights on longer or install more lights, increasing overall power use.
3. **Water-Efficient Appliances:**
   Reduced water usage per wash may lead people to use them more often, increasing total water consumption.



Q75. C

Context: ***The Reserve Bank of India (RBI) has announced an exclusive internet domain 'bank.in' for Indian banks. Sanjay Malhotra, RBI's newly appointed Governor, made this announcement at the Monetary Policy Committee meeting on February 7. The central bank would also roll out 'fin.in' for the financial sector later.***

Reasons for the latest move:

- ***The said move aims to strengthen the digital security framework and tackle growing financial fraud.***
- The central bank in its latest notification mentioned, "The Reserve Bank shall implement the 'bank.in' exclusive Internet Domain for Indian banks. Registration of this domain name will commence from April this year. This will help avoid banking frauds. This will be followed by the 'fin.in' domain for the financial sector."

More on the news:

- Starting April 2025, all the Indian banks will be mandated to operate under 'bank.in' domain.
- This will help customers to differentiate legitimate banking websites from lookalike and fraudulent websites, thereby reducing digital fraud.
- The RBI has also introduced Additional Factor of Authentication (AFA) for domestic digital payments, thus enhancing stricter measures for online banking.
- The said move would help combat cybercrime, prevent malicious activities, and strengthen the country's financial ecosystem.

Q76. A

Context: ***Burkina Faso, a landlocked nation in West Africa, holds historical significance as a former French colony and has faced challenges of political instability, poverty, and rising insecurity in recent years.***

The **Prime Meridian (0° longitude)**, established by the **International Meridian Conference (1884)**, passes through **eight countries** from north to south. Here's the list:

Countries the Prime Meridian Passes Through:

1. **United Kingdom** (Greenwich, London – home of the **Royal Observatory**, the official Prime Meridian marker).
2. **France** (Near *Villers-sur-Mer* in Normandy).
3. **Spain** (Eastern *Valencia* region).
4. **Algeria** (Sahara Desert region).
5. **Mali** (Near *Timbuktu*).
6. **Burkina Faso** (Close to its capital, *Ouagadougou*).
7. **Togo** (Runs through *Togoville*).
8. **Ghana** (Near *Tema* and the *Atlantic coast*).

Q77. B

Context: ***Recently, USA renamed the Gulf of Mexico to the Gulf of America, sparking debates over the geopolitical and historical significance of such a name change.***

Rivers that empty into the Gulf of Mexico:

1. **Mississippi River**: Gulf of Mexico (via the Mississippi Delta in Louisiana).
2. **Rio Grande River**: Gulf of Mexico (near Brownsville, TX/Matamoros, Mexico).
3. **Pearl River**: Gulf of Mexico (along the Mississippi-Louisiana border).

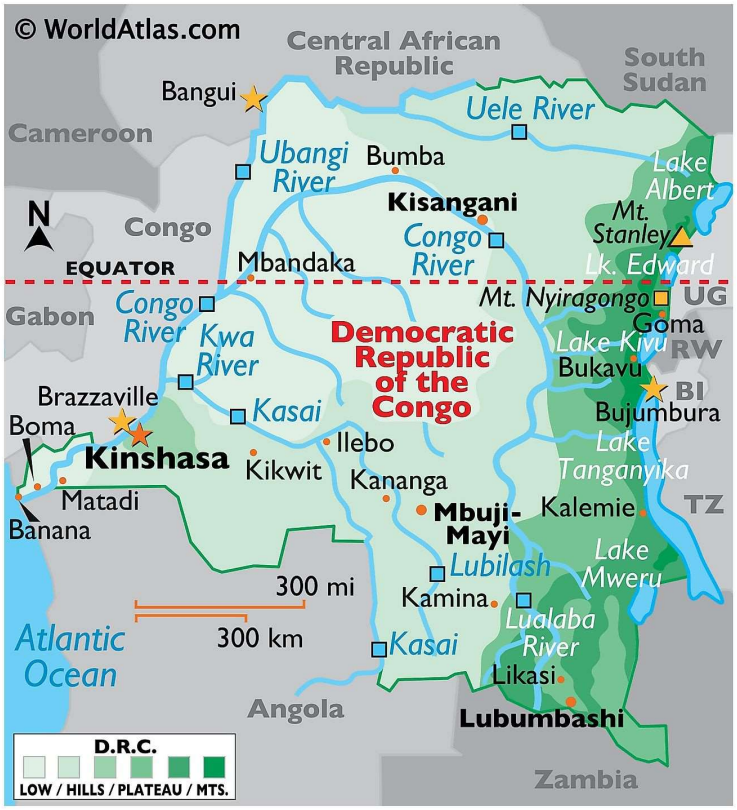
Rivers that do NOT empty into the Gulf of Mexico:

4. **Snake River**: Columbia River → **Pacific Ocean** (Pacific Northwest).
5. **Potomac River**: Chesapeake Bay → **Atlantic Ocean** (Mid-Atlantic).

Q78. D

Context: ***In November 2024, an unidentified disease with flu-like symptoms claimed 143 lives in the Kwango province of the Democratic Republic of Congo (DRC).***

Neighbouring Countries: Borders Republic of Congo, Central African Republic, South Sudan, Uganda, Rwanda, Burundi, Tanzania, Zambia, Angola.



Q79. A

	Places in the news	*Locations*	*Reasons*
1	Phlegraean Fields	Italy	Increase Volcanic activities on a super volcano site
2	Saydnaya Military Prison	Syria	Infamous site for severe human rights violations.
3	Salar de Uyuni	Bolivia	Crucial lithium reserves are found
4	Teknaf	Bangladesh	Encroached on parts of territory by an insurgent force (Arakan Army)

Q80. D

Context: ***A Russian nuclear-powered icebreaker, 50 Let Pobedy, collided with a cargo vessel in the Kara Sea, raising concerns about Arctic navigation safety.***

Correct Order (West to East):

- Barents Sea
- Kara Sea
- Laptev Sea
- East Siberian Sea
- Chukchi Sea
- Bering Sea

Q81. A

Context: ***Indore and Udaipur have become the first Indian cities to receive the prestigious Wetland City Accreditation (WCA) under the Ramsar Convention on Wetlands. Hence statement 3 is not correct.***

What is Wetland City Accreditation (WCA)?

- **Definition:** A voluntary recognition under the Ramsar Convention that honours cities for their efforts in wetland conservation. **Hence statement 1 is correct.**
- **Established in COP12 (2015):** Introduced at the 12th Conference of the Parties (COP12) in Uruguay.
- **Validity:** Accreditation lasts for six years and can be renewed upon continued compliance with international standards. **Hence statement 2 is not correct.**

Objectives:

- Promote the conservation and sustainable use of wetlands in urban and peri-urban areas.
- Balance ecological preservation with socio-economic benefits for local communities.
- Encourage cities near Ramsar sites to maintain positive engagement with these ecosystems.

Criteria for Accreditation:

Cities must meet six key international standards, including:

- Implementing wetland conservation and wise-use measures.
- Enhancing the ecosystem services of wetlands.
- Integrating wetland sustainability into socio-economic planning.
- Involving local communities in conservation efforts.
- Addressing wetland degradation challenges.
- Protecting both natural and artificial wetlands.

Key Features:

- Provides global recognition and positive visibility for cities.
- Encourages wetland-friendly policies in urban planning.

- Supports India's **Amrit Dharohar Initiative** by the **Ministry of Environment, Forest, and Climate Change (MoEF&CC).**
- Aims to integrate ecological preservation with sustainable urban development.

Indian Cities Awarded WCA:

1. **Indore, Madhya Pradesh:** Recognized for **Sirpur Lake**, a Ramsar site known for its bird sanctuary and water bird congregation zone.
2. **Udaipur, Rajasthan:** Accredited for its network of wetlands, including **Pichola, Fateh Sagar, Rang Sagar, Swaroop Sagar, and Doodh Talai**, which support biodiversity and eco-tourism.

Q82. C

Context: ***Recently, Madhya Pradesh government has officially notified the Ratapani Wildlife Sanctuary as the state's 8th Tiger Reserve.***

About Ratapani Wildlife Sanctuary:

- **Location**: Situated in Raisen and Sehore districts of **Madhya Pradesh**, it spreads over 825.90 sq km.
- This rocky forest with aquatic environment is spread on the **Vindhya Hills.**
- It runs parallel on the northern side of the **Narmada River.** The **Kolar River** forms the western boundary of the Sanctuary.
- The Sanctuary has **Bhimbetka,** a **group of rock shelters and rock paintings**, which is one of the " **World Heritage Site** " declared by UNESCO.
- It also encompasses many other historical and religious destinations like **Ginnourgarh Fort**, POW camp, **Keri Mahadeo, Ratapani dam, Jholiyapur dam**, etc.
- **Landscape**: It is rugged with hills, valleys, plateaus, and plains.
- **Flora**:
    - The forest of this Sanctuary is of **dry deciduous and moist deciduous** types.
    - About **55%** of the area is **covered by teak.** The remaining mixed forests consist of various dry deciduous species.
- **Fauna:**
    - The regal striped cat is the apex predator, and estimates suggest that 40 tigers roam these forests.
    - **Chinkara**, an endangered species, is also found in the Sanctuary.
    - It is also home to animals like **the Panther, Hyena, Jackal, Indian Fox, Wild Dog,** Jungle Cat, Small Indian Civet, Blue Bull, Chinkara, Black Buck, Chausingha, Spotted Deer, Barking Deer, etc.

Q83. C

Context: ***The Similipal Tiger Reserve in Odisha has successfully implemented AI-enabled TrailGuard cameras, significantly reducing poaching incidents by 80%.***

What is TrailGuard AI?

- TrailGuard AI is an AI-powered surveillance system designed to combat poaching and illegal wildlife trade by providing real-time monitoring in protected forests.
- It is created by Nightjar Technologies, a Gurgaon-based social impact enterprise specializing in remote conservation surveillance.

How It Works?

- **Movement Detection**: AI-powered cameras remain in low-power mode and activate when they detect movement.
- **Object Classification**: A built-in AI chip analyzes the image and categorizes it as 'animal,' 'human,' or 'vehicle.'
- **Instant Alert System**: If a threat is detected, the camera transmits the image within 40 seconds to a control room.
- **Rapid Response**: Officials share information via WhatsApp and Very High Frequency (VHF) radio to mobilize forest rangers quickly.
- **Identification & Arrest**: Intelligence teams analyze the images, identify poachers, conduct house raids, and forward cases for prosecution.

Key Features & Functions:

- **Compact Design:** Small camera unit (pen-sized) and battery unit (notepad-sized) connected via a 2-meter cable, making it easy to conceal.
- **Long Battery Life**: Operates for 6 months to 1 year without requiring frequent maintenance.
- **High-Speed Transmission**: Images sent to authorities in 30-40 seconds using a cellular network.
- **Cost-Effective:** Priced at ₹50,000–53,000 per unit, making it affordable for large-scale deployment.
- **Wide Adoption**: Currently deployed in 5 states across 14 locations, including Kanha Tiger Reserve (Madhya Pradesh) and Dudhwa National Park (Uttar Pradesh).

Q84. D

Context: ***A recent study on black plastic found that it contains toxic flame retardants, raising concerns over food contamination and health risks.***

What is Black Plastic?

- A type of plastic material often produced from recycled electronic waste like TVs, computers, and appliances.
- Commonly used in kitchen utensils, takeout containers, packaging, and toys.

Composition of Black Plastic:

- Made from polypropylene (PP), polystyrene (PS), and polyethylene (PE).
- Contains flame retardants such as bromine, decabromodiphenyl ether (BDE-209), and heavy metals like lead, mercury, and cadmium.

Production Process:

- Derived from recycled electronic waste, often including banned toxic materials.
- Difficult to sort and recycle, as black pigments absorb infrared sorting rays, making recycling inefficient.

Applications of Black Plastic:

- Kitchen utensils: Spatulas, peelers, and food containers.
- Electronics: Housings for TVs, cables, and chargers. o Automobile industry: Dashboards and interiors.
- Consumer goods: Toys, cosmetics packaging, and furniture.

Note: **Neon (Ne)**, a **noble gas**, is **not found in black plastics** (included here as a misleading but incorrect distractor.)

Q85. B

Context: ***Unverified images of what is being termed as a Chinese sixth-generation fighter aircraft have gone viral on social media.***

Fifth generation fighter jets:

- **F-22 Raptor:** Developed by the USA, it is one of the first operational fifth-generation fighter jets with stealth, super cruise, and advanced avionics.
- **F-35 Lightning II:** A 5th generation multirole stealth fighter by the USA. Used by several NATO and allied nations.
- **Su-57:** Russia's 5th generation stealth fighter jet, though still undergoing full-scale deployment.
- **Chengdu J-20**: China's 5th generation stealth fighter, officially inducted into the PLA Air Force.

While,

- **F-47:** The U.S. Air Force's sixth-generation fighter jet is named the **F-47**, as announced by President Trump in March 2025.
- **Su-30:** A 4th generation Russian multirole fighter. While highly capable, it lacks stealth and other 5th-gen features.

Q86. C

Context: ***A recent study sheds light on antimatter, the elusive partner of matter, and its role in solving the cosmic mystery of why matter dominates the universe.***

- **Statement 1 is correct**: Antimatter propulsion is a theoretical concept (e.g., for deep space travel), but production & storage limitations make it impractical currently.
- **Statement 2 is correct**: PET scans use positrons, which annihilate with electrons, emitting gamma rays for imaging.
- **Statement 3 is not correct**: The matter-antimatter asymmetry is not fully explained by the Standard Model, this is a major open problem in physics (linked to CP violation).
- **Statement 4 is correct:** Antiprotons have been produced and used in experiments like at CERN's Antiproton Decelerator, helping test fundamental symmetries.

Q87. B

Context: ***Researchers has achieved a milestone by conducting a successful gene therapy trial for severe haemophilia A using a lentivirus vector.***

Roctavian:

- **Roctavian** is a **gene therapy** developed by **BioMarin Pharmaceutical**, recently approved by regulatory bodies (including the **EU and FDA**).
- It is used to **treat adults with severe Hemophilia A**, a **genetic disorder** in which the blood doesn't clot properly due to lack of **Factor VIII**.
- It uses an **adeno-associated virus (AAV)** vector to deliver a functional gene that produces Factor VIII, potentially offering a **long-term treatment**.

Q88. A

Context: ***India plans to launch its first quantum satellite within the next 2-3 years under the National Quantum Mission (NQM).***

- **Statement 1 is correct**: Quantum satellites support **Quantum Key Distribution (QKD)**, enabling **extremely secure communication**, immune to hacking under quantum physics principles.
- **Statement 2 is correct**: China's **Micius satellite** (launched in 2016) was the **first quantum communication satellite** in the world.
- **Statement 3 is not correct**: While **entangled photons** are used, they **do not enable faster-than-light or instant communication**. They support **secure encryption**, not instantaneous messaging.
- **Statement 4 is not correct**: **India is developing quantum communication systems**, but **no dedicated quantum satellite has been launched yet**.

Q89. B

Context*: ISRO successfully completed the docking of two satellites as part of the SpaDeX Mission, thus making India the fourth country to dock satellites, after the USA, Russia & China.*

About Space Docking Experiment (SpaDeX) Mission

- **SpaDeX Mission** is a cost-effective **technology demonstrator mission** that will demonstrate in-space docking using two small spacecraft (**'Chaser'** and **'Target'**) designed to be launched from a **single PSLV** class vehicle and to dock at an altitude of about **700 kilometres**.
- **Objective:** SpaDeX mission aims to demonstrate **rendezvous, docking,** and **undocking technologies**, focusing on key technologies like **electrical power transfer** between the docked spacecraft, **in-space robotics**, and conducting payload operations after undocking.
- **First Experiment:** SpaDeX is ISRO's first satellite docking experiment.
- **Launch Details:** Launched on December 30, 2024, from **Sriharikota** by ISRO's **PSLV-C60**, placing two 220-kg satellites in a 475-km circular orbit.
- **Duration:** The mission will run for **2 years**.
- **Docking Process:** The spacecraft will **reduce the distance from 20 km to 3 m**.
- **Biological Research:** SPADEx will support biological studies on plant growth and bacteria, green propulsion systems and artificial intelligence labs in microgravity.

Q90. C

Context: ***India has achieved a groundbreaking milestone in the fight against antimicrobial resistance (AMR) with the development of Nafithromycin, the country's first indigenous macrolide antibiotic.***

About Nafithromycin:

- **Developed by:** Wockhardt Ltd., with support from the Biotechnology Industry Research Assistance Council (BIRAC) under the Biotech Industry Program.

Aim:

- To combat Community-Acquired Bacterial Pneumonia (CABP) and address infections caused by drugresistant bacteria.
- Reduce the global and national burden of antimicrobial resistance.

Effectiveness:

- 10 times more effective than existing treatments like azithromycin.
- Offers a three-day treatment regimen, significantly reducing recovery time.
- Effective against typical and atypical drug-resistant bacteria, with superior safety and minimal side effects.

Q91. C

Context: ***"Never events" are serious and largely preventable healthcare incidents that should not occur if proper safety protocols are followed.***

About Never Events:

- **"Never Events"** are **serious, preventable medical errors** that are **clearly identifiable and measurable**, and should **never occur** in a healthcare setting if proper systems are in place.

Examples include:

- Surgery on the **wrong body part**
- **Wrong-patient** surgery
- Leaving a **foreign object** inside a patient post-surgery
- **Medication errors** leading to serious harm or death
- Hospital-acquired conditions like **air embolism** or **stage 3/4 pressure ulcers**

List of never events as per NHS

Never events are difficult to eradicate, but efforts and a method to prevent them are critical.

CATEGORY	NEVER EVENT
Surgical	Wrong site surgery
Surgical	Wrong implant/prosthesis
Surgical	Retained foreign object post-procedure
Medication	Mis-selection of a strong potassium solution
Medication	Administration of medication by the wrong route
Medication	Overdose of insulin due to abbreviations or incorrect device
Medication	Overdose of methotrexate for non-cancer treatment
Medication	Mis-selection of high-strength midazolam during conscious sedation
Mental health	Failure to install functional collapsible shower or curtain rails
General	Falls from poorly restricted windows
General	Chest or neck entrapment in bed rails
General	Transfusion or transplantation of ABO-incompatible blood components or organs
General	Misplaced naso- or oro-gastric tubes
General	Scalding of patients
General	Unintentional connection of a patient requiring oxygen to an air flowmeter
General	Undetected oesophageal intubation

Q92. A

Context: ***Scientists at the University of Oxford have achieved a breakthrough in distributed quantum computing, successfully linking quantum computers via quantum teleportation for the first time, paving the way for large-scale networked quantum computing.***

What is Quantum Teleportation?

- A quantum phenomenon where the state of a particle is transmitted instantly to another distant particle using quantum entanglement, without physical transfer.
- Used in quantum computing and secure quantum communication.

How It Works?

- **Quantum Entanglement**: Two particles become interlinked, so changes in one instantly reflect in the other, even at large distances.
- **Quantum State Transfer**: Instead of moving physical qubits, their state is transferred across a network link, enabling distributed computing.
- **Logical Gate Teleportation**: Researchers teleported quantum gates (fundamental computational components) instead of individual qubits, enhancing scalability.

Key Features of Quantum Teleportation:

- **Instantaneous State Transfer**: Allows faster, more secure quantum communication.
- **No Physical Movement Required**: Eliminates information loss or decoherence during transfer.
- **Enhances Distributed Computing**: Enables linking small quantum processors into large-scale quantum networks.
- **High Computational Speed**: Reduces bottlenecks, making quantum computing scalable and efficient.
- **Potential for Quantum Internet**: Opens pathways for global quantum networks with ultra-secure data transmission.
- **Option a is correct**: teleportation reconstructs the quantum state on a new particle, effectively transferring it.
- **Option b is not correct**: due to the **no-cloning theorem**, **quantum states cannot be copied** onto multiple particles.
- **Option c is not correct**: teleportation requires both a quantum channel (entangled particles) and classical communication.
- **Option d is not correct**: **information isn't transferred faster than light**, keeping the process consistent with **special relativity**.

Q93. C

Context: ***Recent studies from Italy and the USA report rare cases where biological females carried the SRY gene, challenging conventional understanding of sex determination.***

What is Sex Determination?

- Sex determination is the **biological process** that decides whether a baby develops as a **male or female**, influenced by **genetic and hormonal factors**.

Role of Chromosomes in Sex Determination:

- **Humans have 23 pairs of chromosomes**, including one pair of sex chromosomes: **XX (female) or XY (male)**.
- **Egg cells always carry an X chromosome**, while **sperm cells carry either X or Y**.

- **If a sperm with an X chromosome fertilizes an egg, the baby is female (XX)**; if a **Y-carrying sperm fertilizes the egg, the baby is male (XY)**.

What is the SRY Gene?

- The **SRY (Sex-determining Region Y) gene** is found on the **Y chromosome** and acts as the **master switch** for male development.
- **Function:** It activates a cascade of genes that trigger the formation of **testes** in the embryo, which then produce **testosterone**, promoting male characteristics.
- **SRY Absence:** If the **SRY gene is missing or non-functional**, the embryo develops **female reproductive structures** by default.

How SRY Gene Influences Sex Determination?

- **Normal Process:** If the **SRY gene is present and functional**, the embryo develops into a **male**; if absent, it follows the **female pathway**.
- **Rare Exceptions:** Sometimes, the SRY gene **translocates** (moves) from the **Y chromosome to the X chromosome** due to mutation. This can lead to:
    - **SRY-Positive Males (XX):** Individuals with an **SRY-bearing X chromosome develop as males but remain sterile**.
    - **SRY-Positive Females (XX):** In exceptional cases, females carrying the **SRY gene** develop normally due to **biased X chromosome inactivation**, preventing the gene's function.

Q94. C

Context: ***Microsoft has unveiled Majorana 1, its first quantum computing chip, designed to make quantum computing more stable, faster, and practical. Amazon Web Services (AWS) unveiled 'Ocelot', a new quantum computing chip, which aims to significantly accelerate the development of commercially viable quantum computers.***

What is Majorana 1?

- A quantum computing chip developed by Microsoft to enhance the stability and reliability of quantum processors.
- Uses Majorana particles, a type of exotic quantum state, to minimize computational errors.

Developed By:

- Microsoft, with validation from DARPA (U.S. Defense Advanced Research Projects Agency).
- A finalist in DARPA's US2QC program, which aims to build the first large-scale quantum computer.

How It Works?

- **Topoconductors**: Uses a new material called topological superconductors (topoconductors) to control Majorana particles.
- **Error-Resistant Qubits**: Majorana-based qubits are more stable and less prone to information loss than traditional qubits.
- **Scalability**: Designed to enable quantum computers to scale up to one million qubits, making real-world applications possible.

What is Ocelot?

- A prototype quantum computing chip designed to improve error correction and accelerate the scalability of quantum computers.

- **Developed by**: Amazon Web Services (AWS), the cloud computing division of Amazon.com.

Key Features:

- Uses "cat" qubits inspired by Schrödinger's cat experiment to improve error correction.
- Requires only nine physical qubits to form one logical qubit, reducing hardware requirements.
- Developed using standard chip industry techniques and a tantalum-based material.
- Aims to build a practical quantum computer with 100,000 qubits, rather than the industry estimate of 1 million qubits.

Q95. A

Context: ***Bangalore Water Supply and Sewerage Board (BWSSB) is considering implementing Zero Bacteria technology in apartment Sewage Treatment Plants (STPs) to improve water quality.***

What is Zero Bacteria Technology?

- A water purification technology that eliminates bacterial contamination from water sources.
- Uses nanoparticle coatings, ultraviolet (UV) irradiation, electrostatic filtration, and specialized filtration systems.
- **Developed** by: Indian Institute of Science (IISc), Bengaluru.

How It Works?

- **Nanoparticle Coatings**: Silver nanoparticles disrupt bacterial cell membranes, causing cell death.
- **UV Light Irradiation**: Destroys bacterial DNA, preventing replication.
- **Electrostatic Filtration**: High-voltage filters attract and trap bacteria.
- **Specialized Filtration Systems**: Removes bacteria using fine-pore filters, sometimes infused with antimicrobial agents.

Key Features:

- Advanced bacterial elimination for high-quality treated water.
- Energy-efficient and sustainable solution for wastewater treatment.
- Reduces environmental contamination and enhances water reuse.
- Non-toxic and safe when used in controlled applications.

Q96. D

Context: ***The European Space Agency's (ESA) Euclid space telescope has discovered a rare Einstein ring around galaxy NGC 6505, located 590 million light-years away from Earth.***

About Einstein Ring

- It is a **ring of light around** a form of **dark matter, galaxy or cluster of galaxies**.
- It is essentially an **example of gravitational lensing**.
- Einstein rings **are not visible to the naked eye**, and can be observed only through space telescopes such as Euclid.
- In the case of the recently discovered Einstein ring, NGC 6505 was the gravitational lens.
- The nearer galaxy distorted and amplified the light coming from a distant unnamed galaxy, located 4.42 billion light-years away.
- These are named after mathematician and **physicist Albert Einstein**, whose general theory of relativity predicted that light could bend and brighten around objects across the cosmos.

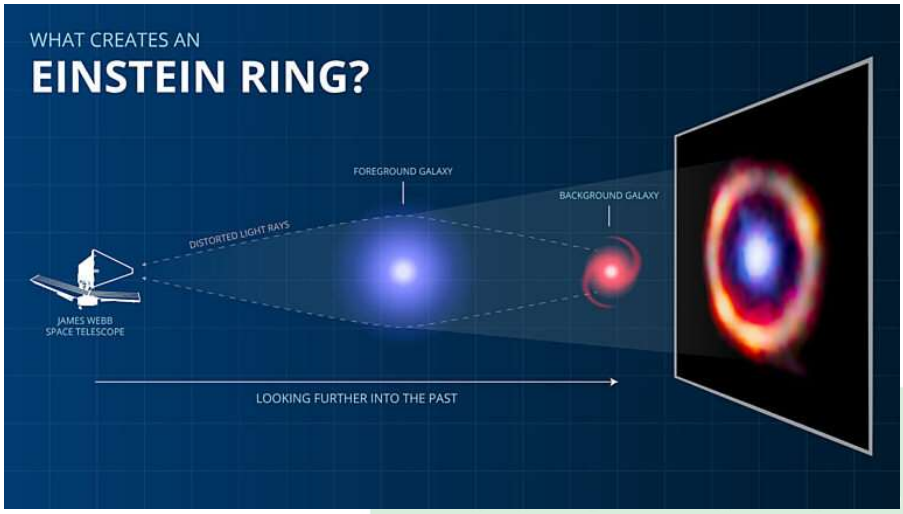
- The first Einstein ring was discovered in 1987, and since then, several more have been discovered.

Significance of Einstein Ring

- These rings **help scientists investigate dark matter**, which has never been detected but is believed to make up 85% of the total matter in the universe.
- They enable scientists to **learn about distant galaxies,** which otherwise might not be visible.
- They can also **provide information** about the **expansion of the universe** as the space between the Earth and other galaxies — both in the foreground and the background

What is Gravitational Lensing?

- It is a phenomenon which occurs when a **massive celestial body** — such as a galaxy or cluster of galaxies — creates a gravitational field which **distorts and amplifies the light** from distant galaxies that are behind it but in the same line of sight.
- The body causing the light to curve is called a gravitational lens.



Q97. B

Context: ***US President has imposed 25% tariffs on China, Mexico, and Canada over fentanyl trafficking, linking the opioid crisis to trade policies.***

What is Fentanyl?

- Fentanyl is a potent synthetic opioid approved for pain relief and anesthesia, nearly 100 times stronger than morphine.
- It is commonly used in medical settings for treating severe pain, but illicitly produced versions contribute to the opioid epidemic
- It can be **illicitly synthesized in underground labs** and **slightly modified chemically** to produce analogs that escape standard legal definitions—making regulation and interdiction extremely difficult.
- It is a **central figure in the global opioid crisis**, particularly in North America, due to its **high fatality rate from overdose**.

Q98. B

Context: ***In January 2025, Venus, Saturn, Jupiter, and Mars have aligned spectacularly in the night sky, creating a rare celestial phenomenon known as a "planet parade."***

About Planet Parade:

- It refers to a situation when **several planets** in our solar system are **visible in the night sky**, at the same time.
- This planetary meet-up, also **known as a conjunction**, makes the two planets appear close together or even touch in the Earth's night sky.
- This phenomenon is more an illusion of perspective rather than the planets being in a perfect line in space.
- Planets have different motions in the sky. They move at different rates compared to the other stars.
- Not all of them are visible in the sky everyday, but sometimes a position comes about so that many or all the planets are visible at the same time, or within a few hours of each other.
- According to NASA, such events, especially those involving four or more planets, are noteworthy and **do not occur annually.**
- This apparent alignment is not a literal straight-line alignment in 3D space, but a line-of-sight effect from our viewpoint.
- The event is purely visual and does not cause gravitational shifts or orbital resonance (eliminating options a and c).
- Option d incorrectly connects it with retrograde motion and the Moon—factors unrelated to the general definition of a Planet Parade.

Q99. A

Context: ***For years, many Indian startups chose to register their companies abroad — often in the US, Singapore, or even the Cayman Islands — to access global investors and funding. But now, a wave of reverse migration is sweeping through India's startup ecosystem.***

About reverse flipping:

- **Reverse Flipping** refers to the process where **Indian startups that were previously registered abroad (such as in the U.S. or Singapore) shift their legal domicile back to India**.
- Many startups originally **"flipped"** to foreign locations for **tax advantages, better investment opportunities, and regulatory ease**.
- However, due to **improving business regulations, government incentives, and investor confidence in India**, some startups are now **returning to India**—hence the term "Reverse Flipping."
- The Indian government is actively encouraging this trend through **policy reforms, startup-friendly regulations, and tax benefits**.

Companies that have flipped back	FROM
PhonePe	Singapore
Zepto	US
Groww	
Companies in process of flipping back	
Razorpay	US
Meesho	
Pine Labs	Singapore
Udaan	
KreditBee	
Companies planning to flip back	
Eruditus	Singapore

Q100. B

Context: ***Italian scientists have demonstrated that light can exist as a supersolid, combining solid-like structure with frictionless flow.***

What Is Super solid Light?

- A super solid is a unique phase of matter that combines the structural rigidity of a solid with the frictionless flow of a superfluid.
- Previously, super solidity had only been observed in Bose-Einstein condensates (BECs)—a state of matter that forms when a collection of bosons is cooled to nearly absolute zero, causing them to share the same quantum state.
- However, researchers led by Antonio Gianfate of CNR Nanotec and Davide Nigro from the University of Pavia have now shown that light can also display this unusual behaviour.
- Rather than traditional freezing, where a liquid solidifies by lowering its temperature, the researchers employed quantum techniques to induce a super solid state in light.
- They utilised a semiconductor platform specifically designed to control photons in a way that mirrors electron behaviour in conductors.
- The team used a gallium arsenide structure embedded with microscopic ridges and fired a laser to generate hybrid light-matter particles called polaritons.
- As the photon count increased, they observed the emergence of satellite condensates—a signature of super solidity.
- These condensates exhibited identical energy but opposite wavenumbers, creating a distinctive spatial arrangement that confirmed the existence of a super solid state.

Significance of the Discovery

- This breakthrough holds profound implications for quantum technology.
- Super solid light could be instrumental in enhancing the stability of quantum bits (qubits), a key component in advancing quantum computing.
- Beyond computing, the ability to control light in this manner could transform optical devices, photonic circuits, and fundamental quantum mechanics research.
- Scientists expect that further studies will refine these techniques, leading to more stable and precisely controlled formations of super solid light.