

# General Studies

## Current Affair Test (March-2025)

### 1. Solution: a)

The Prime Minister Dhan-Dhaanya Krishi Yojana aims to boost agricultural productivity in 100 identified low-productivity districts by improving crop diversification, post-harvest storage, irrigation, and credit access. Unlike direct cash transfers or MSP expansion, the scheme converges existing initiatives and provides targeted interventions for small farmers and landless laborers.

#### About PM's Dhan-Dhaanya Krishi Yojana:

- Ministry: Ministry of Agriculture and Farmers' Welfare.
- Outlay: No separate allocation, but Rs 1,000 crore allocated for pulses, Rs 500 crore for fruits and vegetables, and Rs 100 crore for hybrid seeds.
- Aim: To boost agricultural productivity, crop diversification, post-harvest storage, irrigation facilities, and credit access in 100 low-productivity districts.
- Features:
  - ♦ Convergence of existing schemes and specialized measures.
  - ♦ Focus on sustainable agriculture and crop diversification.
  - ♦ Improved post-harvest storage at panchayat and block levels.
  - ♦ Enhanced irrigation and credit facilities.
  - ♦ Targets small and marginal farmers, rural women, and landless families.

### 2. Solution: a)

The VSHORADS (Very Short-Range Air Defence System), developed by DRDO's Research Centre Imarat (RCI), Hyderabad, is a shoulder-fired missile system designed to intercept low-altitude aerial threats such as drones, helicopters, and low-flying aircraft. However, option a is incorrect because VSHORADS has an effective range of only 250 meters to 6 kilometers, not 12 km. Most MANPADS have a range between 3 and 8 km, making VSHORADS comparable but not superior in range. The missile also includes an adaptive proximity fuze, ensuring high precision in target engagement.

#### About Man Portable Air Defence System (MANPAD):

- What is MANPAD?
  - ♦ A lightweight, shoulder-fired missile system designed to target low-altitude aerial threats like drones, helicopters, and aircraft.
  - ♦ Provides mobility and flexibility to ground

forces for air defence in combat zones.

- **Developed By:**

- ♦ Designed and developed by DRDO's Research Centre Imarat (RCI), Hyderabad.

- **Aim:**

- ♦ To provide the Indian armed forces with an indigenous, advanced air defence system capable of neutralizing modern aerial threats.
- ♦ To replace ageing systems like the Russian Igla MANPADS.

- **Features:**

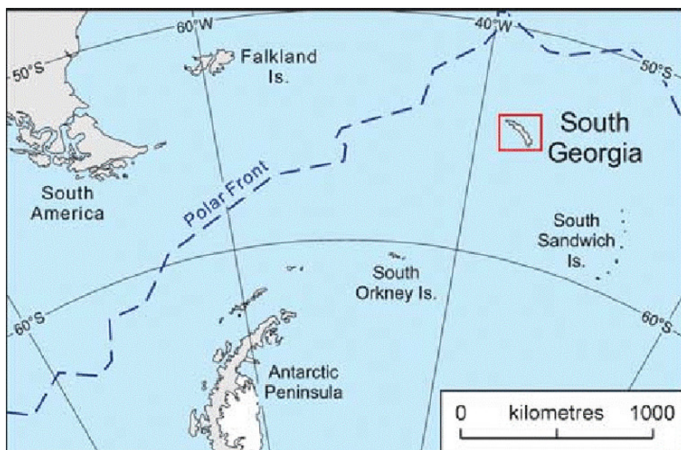
- ♦ Portability: Weighs 5 kg and can be shoulder-fired or mounted on a tripod.
- ♦ Range: Effective range of 250 meters to 6 kilometres.
- ♦ Speed: Maximum speed of Mach 1.5 (1,850 km/h).
- ♦ Warhead: Equipped with a 2 kg adaptive proximity fuze for precise target destruction.
- ♦ Target Engagement: Capable of intercepting low-flying drones and aircraft with reduced thermal signatures.
- ♦ Operational Flexibility: Can be deployed in various combat scenarios, including mountainous and urban terrains

### 3. Solution: d)

The increase in FDI to 100% applies to the entire insurance sector, including life insurance, general insurance, and health insurance. The IRDAI regulates FDI policy in insurance, ensuring financial stability and consumer protection. The reform mandates that all foreign-owned insurers reinvest their collected premiums within India, preventing excessive capital outflows. The increase in FDI is expected to enhance insurance penetration, which declined from 4% in 2022-23 to 3.7% in 2023-24.

### 4. Solution: b)

South Georgia Island is an uninhabited British Overseas Territory, meaning it has no permanent human population. However, there is a seasonal presence of researchers, scientists, and administrative staff at King Edward Point, which serves as the administrative center. The island is located in the South Atlantic Ocean, and its climate is classified as subantarctic, characterized by cold, wet, and windy conditions year-round. It is a crucial breeding ground for various seabirds, penguins (including king and macaroni penguins), and seals, making it an important site for biodiversity and conservation.



### 5. Solution: c)

The Gyan Bharatam Mission is a nationwide initiative launched in Budget 2025-26 to identify, document, and conserve India's manuscript heritage. It does not replace the NMM but rather expands its role with increased funding (60 crore, up from 3.5 crore). The initiative covers manuscripts from various languages and scripts, not just Sanskrit and Pali, making option b incorrect. Additionally, it does not create a single centralized digital library, but it aims for wider accessibility through digitization.

#### What is Gyan Bharatam Mission?

- A national initiative launched to survey, document, and conserve India's rich manuscript heritage.
- Focuses on manuscripts held by academic institutions, museums, libraries, and private collectors.
- **Ministry: Ministry of Culture.**
- **Budget Allocation:**
  - ♦ National Mission for Manuscripts (NMM): Allocation increased from ₹3.5 crore to ₹60 crore.
- **Aim:**
  - ♦ To identify, document, and conserve India's manuscript heritage.
  - ♦ To make manuscripts accessible to researchers, scholars, and the public.
  - ♦ To preserve the wisdom and knowledge contained in ancient texts for future generations.
- **Features:**
  - ♦ Survey and Documentation: Comprehensive survey of over one crore manuscripts across India.
  - ♦ Conservation: Advanced techniques to preserve fragile and ancient manuscripts.
  - ♦ Digitization: Digitizing manuscripts to ensure wider accessibility and prevent physical degradation.
  - ♦ Autonomous Body: Plans to establish an autonomous body for better implementation and management of the mission.
  - ♦ Collaboration: Partnerships with academic institutions, museums, and private collectors

for effective execution.

### 6. Solution: b)

- Statement 1 is incorrect because India is the second-largest producer of cardamom, after Guatemala, which dominates the global export market.
  - Statement 2 is correct as Idukki district in Kerala contributes over 50% of India's small cardamom production.
  - Statement 3 is correct as two new cardamom species, *Elettaria tulipifera* and *Elettaria facifera*, were discovered in the Agasthyamalai hills (Thiruvananthapuram), Munnar (Idukki), and Periyar Tiger Reserve.
- What is Cardamom?

- Known as the "Queen of Spices," cardamom (*Elettaria cardamomum*) is a highly aromatic spice belonging to the Zingiberaceae (ginger) family.
- Native to the evergreen rainforests of the Western Ghats in South India, it is primarily cultivated in Kerala, Karnataka, and Tamil Nadu.

#### Climatic Conditions for Growth:

- Rainfall: 1500–4000 mm annually.
- Temperature: 10°C to 35°C.
- Altitude: 600–1500 meters above sea level.
- Soil: Acidic, loamy, and humus-rich forest soils with a pH of 5.0–6.5.

#### State-wise Production:

- Kerala: Contributes 58% of India's cardamom production, primarily in Idukki district.
- Karnataka: Major production in Kodagu and Chikmagalur districts.
- Tamil Nadu: Cultivated in the Nilgiri hills.

#### Newly Identified Cardamom Species:

- *Elettaria facifera*: Found in Periyar Tiger Reserve, Idukki.
- *Elettaria tulipifera*: Discovered in Agasthyamalai hills (Thiruvananthapuram) and Munnar (Idukki).
- These species were previously misclassified under the genus *Alpinia* and have now been reclassified under *Elettaria*.

### 7. Solution: c)

The scheme does not focus solely on cash crops, nor does it replace existing agricultural programs. Instead, it converges multiple schemes for better implementation. Moreover, it does not prioritize large agribusinesses, as its primary beneficiaries are small and marginal farmers, rural women, and landless workers.

### 8. Solution: d)

- Statement 1 is incorrect: Cardamom requires a tropical rainforest climate, making it unsuitable for Rajasthan and Punjab.
- Statement 2 is incorrect: The Spices Board of India regulates cardamom exports and sets quality standards.
- Statement 3 is incorrect: Guatemala is the world's

largest cardamom producer and exporter; it does not import Indian cardamom.

#### 9. Solution: c)

- Statement 1 is incorrect: The mission does not focus exclusively on Sanskrit manuscripts; it aims to document manuscripts in multiple languages, including Tamil, Telugu, Persian, Arabic, and Pali.
- Statement 2 is correct: The mission incorporates advanced conservation techniques to preserve fragile manuscripts, ensuring long-term protection.
- Statement 3 is correct: The initiative includes AI-based text recognition and translation technologies to make manuscripts more accessible.
- Statement 4 is correct: The government is actively partnering with private collectors, academic institutions, and museums to expand the reach of the mission.

#### 10. Solution: a)

- Statement 1 is incorrect: Insurance penetration is not based on the number of people with insurance coverage, but rather the ratio of total insurance premiums to a country's GDP.
- Statement 2 is correct: Increasing FDI to 100% is expected to attract foreign insurance giants, bringing advanced technology, better underwriting practices, and diverse product offerings.
- Statement 3 is incorrect: The FDI increase is conditional, meaning that foreign companies must reinvest their collected premiums within India and adhere to IRDAI regulations.

#### 11. Solution: b)

Statement 1 is correct as the MPC was introduced through amendments to the RBI Act, 1934, under the Finance Act, 2016.

Statement 2 is correct since the MPC comprises six members—three from the RBI (including the Governor) and three external members nominated by the Government of India.

Statement 3 is incorrect as the MPC's decisions are binding on the RBI, not just recommendatory.

##### What is MPC?

- The MPC is a statutory body established under the Reserve Bank of India Act, 1934, as amended by the Finance Act, 2016. It is responsible for setting the benchmark policy rate (repo rate) to control inflation within a specified target range.
- **Members:**
  - ♦ RBI Governor (Chairperson)
  - ♦ RBI Deputy Governor in charge of monetary policy
  - ♦ One official nominated by the RBI Board
  - ♦ Three external members representing the Government of India
- **Tenure:**
  - ♦ External members serve a four-year term.
  - ♦ RBI Governor and Deputy Governor serve ex-

officio.

##### • Meetings:

- ♦ The MPC meets at least four times a year.
- ♦ Additional meetings can be convened if necessary.

##### • Quorum for Decision:

- ♦ A minimum of four members is required for a quorum.
- ♦ The Governor (or Deputy Governor in their absence) must be present.
- ♦ Decisions are made by majority vote; in case of a tie, the Governor has the casting vote.

##### • Function and Role:

- ♦ Primary role: To determine the repo rate to maintain inflation within the target range (currently 4% +/- 2%).
- ♦ Replaced the earlier Technical Advisory Committee.
- ♦ Decisions are binding on the RBI.
- ♦ The RBI's Monetary Policy Department (MPD) assists the MPC in policy formulation.

#### 12. Solution: b)

Statement-I is correct because Sacred Groves help in conserving biodiversity and regulating water cycles.

Statement-II is correct since the SC has mandated the classification of all Sacred Groves as community reserves.

However, Statement-II does not directly explain Statement-I, as Sacred Groves have traditionally been preserved by communities without government control.

#### 13. Solution: d)

Option (a) is incorrect because this describes the Trickle-Up approach, which focuses on empowering lower-income groups.

Option (b) is incorrect as government subsidies to lower-income groups align more with the Trickle-Up model.

Option (c) is incorrect because redistributive policies are associated more with Trickle-Up economics.

Option (d) is correct as the Trickle-Down theory suggests that benefits given to businesses and wealthy individuals eventually "trickle down" to the poor.

##### Trickle-Down Economics:

- Focuses on wealth accumulation at the top, assuming benefits will gradually reach lower income groups.
- Prioritizes corporate tax cuts, subsidies for big businesses, and deregulation.
  - ♦ E.g. India's corporate tax cuts (2019) reduced revenue for social programs.

#### 14. Solution: b)

Option (a) is incorrect as the Zemu Glacier is a major glacier in Sikkim but not the source of the Teesta River.



Option (b) is correct as Tso Lhamo Lake, located in North Sikkim, is the primary source of the Teesta River.

Option (c) is incorrect because the Kangchenjunga Massif does not directly feed the Teesta River.

Option (d) is incorrect since Brahmagiri Hills is the origin of the Kaveri River, not the Teesta.

#### About Teesta River:

- **Origin:**
  - ♦ The Teesta River originates from Tso Lhamo Lake in the Himalayas, near the Pahunri and Khangse glaciers in Sikkim.
  - ♦ States it pass through: Sikkim and West Bengal.
- **Tributaries:**
  - ♦ Left-bank Tributaries: Lachung Chhu, Chakung Chhu, Dik Chhu, Rani Khola, Rangpo Chhu.
  - ♦ Right-bank Tributaries: Zemu Chhu, Rangyong Chhu, Rangit River.
- **End Point:**
  - ♦ The river merges with the Brahmaputra (Jamuna) in Bangladesh.

#### 15. Solution: d)

Option (a) is incorrect because it does not regulate moneylenders but helps formal financial institutions assess rural creditworthiness.

Option (b) is incorrect because the initiative does not focus on small-scale industries but on financial inclusion.

Option (c) is incorrect as the system is meant to complement traditional banking, not replace it.

Option (d) is correct as the Grameen Credit Score is designed to evaluate the financial health of rural women and SHGs to improve their access to credit.

#### About Grameen Credit Score:

- **What it is:**
  - ♦ The Grameen Credit Score is a digital framework designed to assess the creditworthiness of rural women entrepreneurs and Self-Help Groups (SHGs). It aims to bridge the gap between informal rural economies and formal financial systems.
- **Aim:**
  - ♦ To promote financial inclusion for rural women and SHGs.
  - ♦ To formalize SHG transactions and integrate them into India's central credit system.
  - ♦ To empower rural women entrepreneurs by providing them access to credit, loans, and financial products.
- **How it works:**
- **Credit Assessment:**
  - ♦ The score evaluates the creditworthiness of SHGs and rural women based on their financial transactions, repayment history, and business activities.
  - ♦ It uses a digital framework to analyze data,

ensuring transparency and accuracy.

- **Integration with Financial Institutions:**

- ♦ Public sector banks are primarily responsible for developing and implementing the scheme.
- ♦ Financial institutions use the score to offer tailored financial products, such as loans and credit cards, to SHGs and rural women.
- ♦ Institutions Covered: Public sector banks, Regional Rural Banks (RRBs), Microfinance institutions (MFIs), Other financial institutions involved in rural credit.

- **Features:**

- **Enhanced Financial Access:**

- ♦ Enables rural women to access credit cards, loans, and other financial products.
- ♦ Introduces concepts like EMIs, creditworthiness, and loan repayment to SHGs.

- **Customized Financial Products:**

- ♦ Offers tailored credit cards for micro-enterprises with limits up to ₹5 lakh.
- ♦ Provides flexible loan options to support business expansion.

- **Improved Credit Assessment:**

- ♦ Addresses gaps in the current credit bureau system, which often overlooks SHG members.
- ♦ Ensures a fair and transparent evaluation of creditworthiness.

- **Economic Stability:**

- ♦ Empowers rural women to contribute more effectively to their households and communities.
- ♦ Promotes sustainable development and poverty alleviation.

- **Digital Framework:**

- ♦ Leverages technology to create a seamless and efficient credit assessment system.
- ♦ Ensures easy access to credit scores and financial products for rural women.

#### 16. Solution: c)

Option (a) is incorrect as Fort William was never a residence for the British Governor.

Option (b) is incorrect since British trading activities were centered in the factories and settlements, not Fort William.

Option (c) is correct as Fort William was built primarily to defend against other European powers (like the French and Dutch) and Indian rulers (such as Siraj-ud-Daulah).

Option (d) is incorrect because it was never a penal colony but a military base.

#### About Fort William:

- Located in: Fort William is situated in Kolkata, West Bengal, on the eastern banks of the Hooghly River, a major tributary of the Ganga.
- Built in:
  - ♦ The original Fort William was constructed in

1696 and completed in 1706.

- ♦ The current fort was rebuilt between 1758 and 1781 after the Battle of Plassey.
- **Built by:**
  - ♦ The original fort was built by the British East India Company under Sir John Goldsborough.
  - ♦ The current fort was reconstructed under the supervision of Robert Clive after the British regained control of Kolkata following the Battle of Plassey (1757).
- **History:**
- **Original Fort (1696-1706):**
  - ♦ Constructed during the early years of British rule in Bengal.
- Named after King William III of England.
- Captured and destroyed by Siraj-ud-Daulah, the Nawab of Bengal, in 1756 during the Siege of Calcutta.
- **Rebuilt Fort (1758-1781):**
  - ♦ Reconstructed by the British after their victory in the Battle of Plassey (1757).
  - ♦ Designed as a massive military fortification to prevent future attacks.
- **Features:**
- **Architecture:**
  - ♦ Spread over 70 hectares, the fort is one of the largest British-era military structures in India.
  - ♦ Designed in a star-shaped layout for enhanced defense capabilities.
- **Current Use:**
  - ♦ Headquarters of the Indian Army's Eastern Command.
- **Historical Significance:**
  - ♦ The site of the infamous "Black Hole of Calcutta" incident in 1756.
  - ♦ Home to the first Indian Masonic lodge, established in 1730.
- **Cultural and Military Heritage:**
  - ♦ Houses a war memorial and museum showcasing artifacts from the 1971 Indo-Pakistani War and the Bangladesh Liberation War.
- **Recent Changes:**
  - ♦ Along with it, Kitchener House renamed Manekshaw House, and St. George's Gate renamed Shivaji Gate as part of the "Indianisation" of military traditions.

## 17. Solution: a)

Statement 1 is incorrect as NavIC is a regional navigation system, not a global one like GPS.

Statement 2 is incorrect because NavIC, while independent, can still face potential interference or jamming threats.

Statement 3 is correct as NavIC satellites are placed in geostationary and geosynchronous orbits to maximize coverage over India.

## • What is NavIC?

- ♦ NavIC, formerly known as the Indian Regional Navigation Satellite System (IRNSS), is India's indigenous satellite navigation system designed to provide accurate positioning, navigation, and timing services over India and its surrounding regions.
- ♦ **Organization: Indian Space Research Organisation (ISRO).**
- ♦ **Aim:** NavIC aims to reduce India's dependence on foreign navigation systems like GPS (USA), GLONASS (Russia), and Galileo (Europe) by providing a reliable and autonomous positioning system for both civilian and strategic applications.

## • How it Works:

- ♦ NavIC operates through a constellation of seven satellites: three in geostationary orbit (GEO) and four in geosynchronous orbit (GSO).
- ♦ The system uses dual-frequency signals (L5 and S bands) to provide accurate positioning data.
- ♦ Ground stations, including control centers and monitoring stations, ensure seamless operation and signal integrity.

## • Features:

- ♦ **Coverage:** Provides services over India and a region extending up to 1,500 km beyond its borders.
- ♦ **Accuracy:** Offers position accuracy better than 20 meters and timing accuracy better than 50 nanoseconds.

## • Dual Services:

- ♦ **Standard Positioning Service (SPS):** For civilian use, including transportation, disaster management, and personal navigation.
- ♦ **Restricted Service (RS):** Encrypted service for strategic and military applications.
- ♦ **Interoperability:** NavIC signals are compatible with other global navigation systems like GPS, GLONASS, and Galileo.
- ♦ **New Developments:** Introduction of L1 band signals (1575.42 MHz) for enhanced civilian use, starting from 2023.

## • Applications:

- ♦ Transportation (land, air, and marine navigation).
- ♦ Disaster management and resource monitoring.
- ♦ Scientific research and surveying.
- ♦ Time synchronization for critical infrastructure.
- ♦ Strategic and defense applications.

## 18. Solution: a)

Statement 1 is incorrect because the MPC's primary role is to set interest rates for inflation control, not directly regulate money supply.

Statement 2 is incorrect as the current inflation target is  $4\% \pm 2\%$ , not  $3\% \pm 1\%$ .

Statement 3 is correct since the MPC was introduced to make monetary policy decisions more structured and transparent.

### 19. Solution: c)

Statement 1 is correct: The PEMS Act, 2013, completely bans manual scavenging across India.

Statement 2 is correct: Employers who hire manual scavengers in insanitary latrines are liable for punishment, including imprisonment and fines.

Statement 3 is correct: The Act provides for rehabilitation measures, such as financial assistance, skill training, and alternate livelihood opportunities.

Statement 4 is incorrect: While the Act promotes mechanized cleaning, it does not explicitly mandate its use for all cleaning activities. Some manual interventions are still reported, though discouraged.

### 20. Solution: c)

Provision 1 is correct: Waqf properties cannot be sold, gifted, or mortgaged without prior approval from the State Waqf Board. Unauthorized transactions are legally null and void.

Provision 2 is correct: The Waqf Tribunal has exclusive jurisdiction over Waqf-related disputes, preventing interference from civil courts.

Provision 3 is correct: The Waqf Act, 1995, provides for the digitization of Waqf records, helping in land management and preventing illegal encroachments.

### 21. Solution: c)

Option a is incorrect: Delhi's Assembly can legislate only on State List and Concurrent List subjects, except Public Order, Police, and Land (Entries 1, 2, and 18 of the State List), which remain under Central control.

Option b is incorrect: The LG is not fully bound by the Council of Ministers' advice. Under Article 239AA(4), the LG can refer matters to the President if a disagreement arises, leading to delays.

Option c is correct: The 69th Constitutional Amendment (1991) inserted Article 239AA, giving Delhi a unique governance structure—not a full state, but more than a Union Territory.

Option d is incorrect: The Supreme Court (2018 & 2023 rulings) clarified that Delhi is NOT a full-fledged state but has limited legislative autonomy.

#### About Delhi Assembly:

- **Historical Background:**

- ♦ Delhi's first legislative Assembly was constituted in 1952, with limited powers under the Part-C state
- ♦ The Assembly was abolished in 1956, and Delhi became a Union Territory, remaining without an Assembly for 37 years until 1993.

- **Governance Structure:**

- ♦ From 1956 to 1993, Delhi was governed by

a Metropolitan Council with recommendatory powers, while the central government retained control over key areas like law and order and land.

- ♦ In 1993, Delhi regained its legislative Assembly with 70 seats, but critical functions like police and land remained under central jurisdiction.

- **Article 239AA of the Indian Constitution:**

- ♦ Insertion and Special Status: Introduced by the 69th Constitutional Amendment Act, 1991, granting special status to Delhi based on the S Balakrishnan Committee (1987)

- **Composition and Representation:**

- ♦ The Delhi Assembly has 70 elected members, a party must win 36 seats to form government.
- ♦ The Council of Ministers is limited to 10% of the Assembly's strength, meaning Delhi can have a maximum of 7 Ministers.
- ♦ Legislative Powers: The Assembly can make laws on State List and Concurrent List subjects, except for Public Order, Police, Land, and related entries (64, 65, 66) in the State List, which remain under Central control.
- ♦ Governance Structure: The Chief Minister is appointed by the President and advises on ministerial appointments. The Governor (LG) acts as the administrator, with the power to summon, prorogue, and dissolve the Assembly.
- ♦ Judicial Interpretations: Two Constitution Benches of the Supreme Court (2018 & 2023) clarified Delhi's governance framework and the extent of its legislative and executive powers.

Supporting Legislation: The Government of National Capital Territory of Delhi Act, 1991, was enacted to define Delhi's administrative structure and governance framework post-Article 239AA.

### 22. Solution: a)

Option a is correct: Quantum teleportation relies on quantum entanglement, where the quantum state of one particle is instantaneously transferred to another distant particle without any physical movement.

Option b is incorrect: Quantum teleportation does not transfer physical matter but only quantum states (information about a quantum system).

Option c is incorrect: There is no need to convert classical data into quantum data, as teleportation involves direct state transfer rather than conversion.

Option d is incorrect: Quantum teleportation can be performed at non-zero temperatures but requires isolation from environmental decoherence.

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.

### 23. Solution: b)

Option a is incorrect: While submarine warfare is a key part of TROPEX-25, it is not the primary focus. The exercise tests overall naval combat readiness.

Option b is correct: TROPEX is a joint military exercise involving the Indian Navy, Air Force, Army, and Coast Guard, aiming to test interoperability and combat preparedness.

Option c is incorrect: Although India has sea-based nuclear deterrence (SSBNs), TROPEX is not focused on live nuclear missile tests.

Option d is incorrect: TROPEX does not focus solely on anti-piracy operations, though maritime security is one of its components.

### About Theatre Level Operational Exercise (TROPEX-25):

- **What is TROPEX?**
  - ♦ Theatre Level Operational Readiness Exercise (TROPEX) is the Indian Navy's largest biennial maritime exercise, testing combat readiness and joint warfighting capabilities.
  - ♦ Location: Hosted by India, the exercise is conducted across the Indian Ocean Region (IOR), including strategic maritime zones.
- **Participation:**
  - ♦ Led by the Indian Navy, with substantial participation from the Indian Army, Air Force, and Coast Guard.
- **Key Features & Objectives:**
  - ♦ Focuses on maritime security, anti-submarine

warfare, cyber and electronic warfare, and live weapon firings.

- ♦ Tests integrated response strategies against conventional, asymmetric, and hybrid threats.
- ♦ Includes joint work-up phases, amphibious exercises, and combat scenario simulations.

### 24. Solution: c)

Option a is incorrect: Olive Ridley turtles exhibit both solitary nesting and mass nesting (Arribada), depending on the region.

Option b is incorrect: Arribada occurs not only in the Indian Ocean but also in the Pacific (Costa Rica, Mexico) and Atlantic Oceans.

Option c is correct: Female Olive Ridley turtles show natal homing, meaning they return to the same beach where they hatched to lay eggs.

Option d is incorrect: While most females nest annually, some skip a year due to environmental factors.

### About Olive Ridley Sea Turtle:

- **Scientific Classification:**
  - ♦ Scientific Name: *Lepidochelys olivacea*
- **IUCN Status:**
- **Physical & Biological Features:**
  - ♦ Smallest sea turtle species, weighing up to 45 kg, with a heart-shaped olive-green carapace.
  - ♦ Omnivorous diet, feeding on crustaceans, algae, mollusks, and jellyfish.
  - ♦ Unique arribada (mass nesting) behavior, with thousands nesting simultaneously on select beaches.
  - ♦ The mating season of Olive Ridley turtles occurs between November and April, leading to mass nesting (arribada) on select beaches.
- **Habitat & Distribution:**
  - ♦ Found in tropical waters of the Pacific, Indian, and Atlantic Oceans.
  - ♦ Nesting sites in India include Odisha (Gahirmatha, Devi, Rushikulya), Tamil Nadu, Andhra Pradesh, and Andaman & Nicobar Islands.

### 25. Solution: b)

Option a is incorrect: The 'bank.in' domain does not replace individual bank websites but ensures that legitimate banks operate under a verified and secure domain.

Option b is correct: The RBI's 'bank.in' initiative is designed to combat financial fraud, phishing attacks, and cyber threats by ensuring that all registered banks operate under a standardized, RBI-approved domain.

Option c is incorrect: The initiative does not mandate blockchain adoption; it focuses on securing domain authenticity.

Option d is incorrect: NBFCs and fintech firms are not covered under 'bank.in'. Instead, RBI plans to introduce 'fin.in' for broader financial services.

About 'bank.in':

- **Definition & Purpose:**
  - ♦ 'bank.in' is an exclusive internet domain for all registered Indian banks.
  - ♦ It aims to differentiate legitimate banking websites from fraudulent ones, reducing cyber threats.
- **How It Works?**
  - ♦ Starting April 2025, all Indian banks must operate under 'bank.in', ensuring a secure and verified online presence.
  - ♦ Customers can easily identify genuine banking platforms, preventing phishing and financial fraud.
- **Key Features & Functions:**
  - ♦ **Fraud Prevention:** Eliminates fake banking sites that deceive customers.
  - ♦ **Regulatory Compliance:** Mandatory for all Indian banks, ensuring a standardized domain structure.
  - ♦ **Customer Protection:** Enhances public trust by providing a verified and secure banking domain.
  - ♦ **Cybersecurity Enhancement:** Reduces risks from phishing attacks, cyber frauds, and identity theft.
  - ♦ **Financial Sector Expansion:** RBI plans to introduce 'fin.in' for broader financial services beyond banking.
- **Additional Cybersecurity Measures:**
  - ♦ **Additional Factor of Authentication (AFA)** extended to international digital transactions.
  - ♦ **NBFCs and banks** required to enhance cyber risk detection and incident response strategies.

## 26. Solution: d)

Statement 1 is incorrect: India has set a target of 500 GW renewable energy capacity by 2030, but not 200 GW of solar energy by 2025.

Statement 2 is incorrect: The PM Surya Ghar Muft Bijli Yojana (2024) is India's major rooftop solar adoption scheme, not Surya Jyoti Yojana (which does not exist).

Statement 3 is incorrect: Rajasthan has the highest installed solar power capacity, followed by Gujarat and Karnataka.

About Recent Achievements of India in Solar Energy:

- **Solar Energy Target and Capacity Expansion:**
  - ♦ India achieved 100 GW of solar capacity as of January 2025, aiming for 500 GW of renewable energy by 2030.
  - ♦ Solar energy now contributes 47% of total installed renewable capacity, showing its dominance in clean energy.
- **Rapid Growth Trends in Solar Installations:**
  - ♦ A 3,450% increase in solar capacity from 82 GW in 2014 to 100 GW in 2025.
  - ♦ 2024 saw record-breaking 24.5 GW solar

additions, doubling from 2023, with 5 GW utility-scale installations.

- ♦ Rajasthan, Gujarat, Tamil Nadu, Maharashtra, and Madhya Pradesh lead in large-scale solar deployment.
- **Key Government Schemes Driving Solar Growth:**
  - ♦ **PM Surya Ghar Muft Bijli Yojana (2024):** Boosting rooftop solar adoption, nearing 9 lakh installations.
  - ♦ **Solar Parks Scheme:** Developing large-scale solar clusters across states.
  - ♦ **PLI Scheme for Solar Manufacturing:** India's solar module production surged from 2 GW (2014) to 60 GW (2024), targeting 100 GW by 2030.

## 27. Solution: d)

Statement-I is incorrect: A repo rate reduction usually increases inflation by boosting borrowing and spending.

Statement-II is correct: Lower repo rates reduce borrowing costs, leading to higher demand, which can increase inflation.

What is Repo Rate?

- The repo rate is the interest rate at which the RBI lends money to commercial banks for short-term needs. It is a key monetary policy tool used to control inflation, manage liquidity, and influence economic growth.
- **How Does It Work?**
  - ♦ When the RBI lowers the repo rate, borrowing costs for banks decrease, enabling them to offer loans at lower interest rates to consumers and businesses.
  - ♦ Conversely, an increase in the repo rate makes borrowing expensive, curbing excessive spending and controlling inflation.
- **Impact of Repo Rate Reduction on the Economy:**
  - ♦ **Cheaper Loans:** A lower repo rate reduces interest rates on loans, making home, vehicle, and personal loans more affordable.
  - ♦ **Boost to Spending and Investment:** Lower borrowing costs encourage individuals and businesses to spend and invest, stimulating economic activity.
  - ♦ **Job Creation:** Increased investment and spending can lead to higher employment opportunities.
  - ♦ **Inflation Management:** While a rate cut can spur growth, it may also risk higher inflation if not managed carefully.
  - ♦ **Global Alignment:** The rate cut aligns India with global trends, where many central banks have adopted accommodative monetary policies to support growth.

## 28. Solution: d)

Option a is incorrect: Under Article 239AA(3)(c), the LG can reserve bills for Presidential consideration.



Option b is incorrect: The LG has discretionary powers to override the Chief Minister's decisions, particularly in cases where there is a conflict between the Delhi Government and the Centre.

Option c is incorrect: The LG appoints the Chief Minister and other ministers on the President's behalf.

Option d is correct: The LG cannot dissolve the Delhi Assembly on the CM's advice. Unlike full-fledged states where Governors dissolve the Assembly on the Chief Minister's recommendation, in Delhi, such a decision rests with the President.

## 29. Solution: a)

China leads the world in installed solar power capacity, with over 500 GW of operational solar projects.

India ranks third, after China and the U.S., but is the fastest-growing solar market in the Global South.

Germany has the highest solar capacity in Europe but lags behind China, the U.S., and India.

## 30. Solution: b)

Statement 1 is correct: Starting April 2025, all scheduled banks in India must operate under 'bank.in', ensuring a secure and verified digital presence.

Statement 2 is correct: As part of cybersecurity measures, banks transitioning to 'bank.in' must enhance multi-factor authentication (MFA), strengthening online banking security.

Statement 3 is incorrect: The 'bank.in' initiative is focused on cybersecurity, not directly linked to India's transition to a cashless economy.

## 31. Solution: b)

LF is transmitted by various mosquito species (Culex, Anopheles, and Aedes), making vector control challenging. The parasites (Wuchereria bancrofti, Brugia malayi, and Brugia timori) can survive in the human body for years, but treatment with anti-filarial drugs (DEC, Albendazole, Ivermectin) is effective when administered properly. The disease does not spread directly between humans and MDA drugs have manageable side effects, making options (c) and (d) incorrect.

What is Lymphatic Filariasis?

- Lymphatic Filariasis (LF), also called Elephantiasis, is a parasitic disease caused by filarial worms that infect the human lymphatic system, leading to severe swelling and disability.

India's Status:

- India is among the highest-burden countries for LF, contributing significantly to the global caseload.
- Bihar, Uttar Pradesh, and Odisha are among the states with the highest number of LF cases
- The government aims to eliminate LF by 2027 through mass drug administration, morbidity management, and vector control

Causes and Transmission:

- Caused by Wuchereria bancrofti (most common),

Brugia malayi, and Brugia timori

- Transmitted through mosquito bites (Anopheles, Culex, Aedes species).
- Requires repeated mosquito bites over months or years for infection to establish.

Symptoms:

- Asymptomatic in early stages but leads to chronic lymphatic damage over time.

Common symptoms:

- Lymphedema: Swelling of arms, legs, breasts, or genitals.
- Elephantiasis: Thickening of the skin and severe swelling.
- Hydrocele: Swelling of the scrotum (in males).
- Recurrent infections due to weakened immunity.

Prevention and Treatment

- Mass Drug Administration (MDA): Annual distribution of anti-filarial drugs (Diethylcarbamazine + Albendazole).
- Triple Drug Therapy in select districts to accelerate LF elimination efforts.
- Triple Drug Therapy includes diethylcarbamazine (DEC) + Albendazole + Ivermectin.
- Morbidity Management & Disability Prevention (MMDP): Ensuring access to care for affected individuals.
- Surgical intervention: Hydrocelectomy under Ayushman Bharat PM-JAY
- Vector Control: Use of mosquito nets, insecticides, and community awareness.

## 32. Solution: d)

The Defence Partnership–India (DP-I) focuses on joint development of advanced defence technologies, including high-velocity missiles, laser beam riding systems, and lightweight multirole missiles. It does not aim to merge air forces or create a UK-India supply chain exclusively. Although AI-based cyber defence is an area of concern, it is not the primary goal of the agreement.

Key India-UK Defence Agreements:

- Defence Partnership–India (DP-I):
  - ♦ Laser Beam Riding MANPADS (LBRM): Thales UK & Bharat Dynamics Ltd. (BDL) signed a contract for STARStreak high-velocity missiles.
  - ♦ Lightweight Multirole Missiles (LMM): Future production collaboration between Thales & BDL.
  - ♦ ASRAAM Missile Facility: MBDA UK & BDL to set up India's first Advanced Short-Range Air-to-Air Missile (ASRAAM) assembly & test centre in Hyderabad.
- Maritime Defence Cooperation:
  - ♦ Integrated Full Electric Propulsion (IFEP) System: UK & India signed a Statement of Intent to design and develop electric propulsion systems for Indian Navy ships.

- ♦ Land-Based Testing Facility (LBTF): GE Vernova & BHEL to develop India's first maritime testing facility for future Landing Platform Dock (LPD) fleets by 2030.
- Strategic & Economic Impact:
  - ♦ Boosts Atmanirbhar Bharat: Supports India's self-reliance in defence manufacturing.
  - ♦ Creates Jobs: Strengthens bilateral industrial collaboration and adds Indian industries to Thales' global supply chain.
  - ♦ Interoperability: Enhances defence coordination between the two-armed forces.

### 33. Solution: b)

MIS covers perishable crops that do not fall under MSP, making Statement 1 correct.

The 2025 revision expanded procurement agencies, including Farmer Producer Organizations (FPOs) and Farmer Producer Companies (FPCs), making Statement 2 correct.

However, States still need approval from the central government to implement MIS, making Statement 3 incorrect.

What is the Market Intervention Scheme (MIS)?

- A price support scheme under the Department of Agriculture & Farmers' Welfare.
- Part of the PM-AASHA scheme, ensuring remunerative prices for farmers.
- Covers perishable crops (horticultural & agricultural commodities) that do not have Minimum Support Price (MSP).
- Implemented on request of State/UT Governments when market prices drop by at least 10% compared to the previous season.

Key Features of MIS:

- Ad-hoc Scheme: Applied during market price crashes.
- State-Central Cost Sharing: 50:50 (75:25 for North-Eastern States).
- Operational by NAFED, NCCF & State Agencies.

Revised Market Intervention Scheme (MIS):

- Increased Procurement Limit: Procurement coverage raised from 20% to 25% of total production.
- Direct Benefit Transfer (DBT) Option: States can now pay farmers directly for the price difference between the Market Intervention Price (MIP) and market price.

Expanded Procurement Agencies:

- Farmer Producer Organizations (FPOs), Farmer Producer Companies (FPCs), State-nominated agencies, and Central Nodal Agencies (NAFED, NCCF) will procure TOP (Tomato, Onion, Potato) crops.

Reimbursement of Storage & Transport Costs:

- Central Nodal Agencies (CNA) will reimburse costs for transporting crops from producing to

consuming States.

### 34. Solution: c)

The Bombay Blood Group (hh phenotype) lacks the H antigen, which is the precursor for the A and B antigens in the ABO system. This means individuals with Bombay Blood Group cannot receive blood from ABO or O-negative donors because those blood types still contain the H antigen, triggering a severe immune reaction. The blood group was first discovered in India, not South Africa, and its global prevalence is extremely rare (~1 in 1 million), making options (b) and (d) incorrect.

What is the Bombay Blood Group?

- A rare blood type (hh phenotype) first discovered in Mumbai (Bombay) in 1952 by Y.M. Bhende.
- Lacks the H antigen, which is the base structure for A and B antigens in the ABO blood group system.

Unique Characteristics

- Individuals with this blood type cannot receive blood from any ABO group, including O-negative, as it contains the H antigen.
- Can only receive blood from another Bombay blood group donor, making transfusions highly difficult.
- Prevalence: 1 in 10,000 in India, 1 in 1 million globally.

Challenges in Blood Transfusion:

- Routine blood tests often misidentify Bombay blood group as O-type, leading to misdiagnosis and transfusion complications.
- Receiving blood with the H antigen can trigger an acute hemolytic transfusion reaction, causing severe immune responses.

### 35. Solution: c)

The Morand-Ganjal Irrigation Project is entirely within Madhya Pradesh and does not involve inter-state water sharing with Maharashtra, making Statement 1 incorrect.

The Morand River originates within Madhya Pradesh, not Chhattisgarh, making Statement 2 incorrect.

The project is expected to impact wildlife corridors, particularly affecting Satpura and Melghat Tiger Reserves, making Statement 3 correct.

About Morand-Ganjal Irrigation Project:

- What it is: A dam-based irrigation project aimed at improving agricultural productivity in Madhya Pradesh.
- Rivers Involved: Morand and Ganjal Rivers.
- Both the Morand and Ganjal rivers are considered major tributaries of the Narmada River.
- The Ganjal being a left bank tributary and the Morand being a significant tributary of the Ganjal.
- Location: Covers Hoshangabad, Betul, Harda, and Khandwa districts in Madhya Pradesh.

### 36. Solution: d)

The Paris AI Summit is not initiated by the United

Nations; it is organized by France (Statement 1 incorrect).

The summit does not enforce a single regulatory framework but instead sets AI governance norms (Statement 2 incorrect).

Private AI firms like OpenAI, Google, and other tech CEOs actively participate in discussions, making Statement 3 incorrect.

### 37. Solution: b)

Oxidation and hydrolysis reactions are common microbial strategies to break down polymer chains, making Statement 1 correct.

Plastic degradation does not always result in complete mineralization; sometimes, it leads to microplastic formation, making Statement 2 incorrect.

Environmental factors like UV exposure, temperature, and microbial activity significantly impact plastic degradation rates, making Statement 3 correct.

**Bacteria and Plastic Degradation:**

**Bacteria That Break Down Plastic:**

**Ideonella sakaiensis:** Discovered in Kyoto Institute of Technology, breaks down PET plastics using two enzymes.

**X-32 Bacteria:** Degrades PET, polyolefins, and polyamides, effective against tough carbon-carbon bonds.

**Vibrio natriegens:** Genetically engineered to attach PET-degrading enzymes for rapid plastic breakdown.

**Bacillus subtilis:** Incorporated into biodegradable plastics, activated in compost for gradual degradation.

**Enzymatic Plastic Degradation:**

- Scientists have engineered enzymes like PETase and MHETase, enhancing their efficiency for large-scale use.
- French company Carbios developed heat-stable PET-degrading enzymes that break down 90% of PET in 10 hours.
- Enzyme-derived breakdown products can be used for recycling and circular economy models.

**Challenges & Limitations:**

- **Time Factor:** Bacterial degradation can take months to years, slowing industrial applications.
- **Scalability:** Producing and deploying bacteria or enzymes at an industrial scale is costly.
- **Selective Efficiency:** Many strains work only on specific plastics, limiting universal application.
- **Regulatory Issues:** Concerns exist over introducing engineered bacteria into ecosystems.
- **Crystalline PET Resistance:** Most bacteria struggle to degrade highly crystalline PET, like plastic bottles.

### 38. Solution: a)

Article 324 provides for the superintendence, direction, and control of elections by the Election Commission

of India.

Article 326 establishes universal adult suffrage as the basis for elections.

Article 330 deals with the reservation of seats for Scheduled Castes and Scheduled Tribes in Lok Sabha.

Article 356 relates to the imposition of President's Rule in a state in case of constitutional breakdown.

### 39. Solution: a)

LF is classified as a Neglected Tropical Disease (NTD) by WHO, making Statement 1 correct. India has introduced Triple Drug Therapy (DEC + Albendazole + Ivermectin) in certain endemic regions to accelerate elimination (Statement 2 correct). However, LF is caused by parasitic worms (filarial nematodes), not protozoa, making Statement 3 incorrect.

### 40. Solution: a)

The Bombay Blood Group is extremely rare, occurring in 1 in 10,000 people in India and 1 in a million globally (Statement-I correct).

The low prevalence is due to its recessive inheritance pattern (hh), requiring both parents to be carriers (Statement-II correct and explains Statement-I).

Thus, option (a) is the correct answer.

### 41. Solution: a)

The 'Tax Year' concept synchronizes taxation with the financial year, replacing the old assessment year system.

It reduces compliance burden, making tax filing more efficient.

The system is designed to simplify taxation rather than increase the compliance burden.

What is the 'Tax Year' Concept?

- The Tax Year refers to a 12-month period starting from April 1, during which income will be assessed and taxed in the same financial year.
- It replaces the Assessment Year system, where income was taxed in the year following the financial year in which it was earned.

#### Key Differences from the Old Regime:

Feature	Old Regime (Assessment Year)	New Regime (Tax Year)
Definition	Income taxed in the following year	Income taxed in the same year
Reporting System	Delayed assessment process	Real-time tax reporting
Flexibility	Rigid compliance structure	More adaptable tax reporting
Clarity	Complex cross-referencing	Simplified, structured taxation

#### Features of the 'Tax Year' Concept:

- **Synchronizes Income & Taxation:** Ensures taxes are paid in the same year income is earned.



- **Simplifies Compliance:** Reduces confusion regarding financial year and assessment year.
- **Modernized Tax Framework:** Makes tax filing more transparent and efficient.
- **Enhances Revenue Collection:** Reduces tax evasion by enabling real-time assessment.
- **Improves Clarity:** Tax deductions, rates, and exemptions presented in a tabular format for better understanding.

#### 42. Solution: d)

Dokra Metal Craft uses the lost-wax casting method, where each mold is destroyed after use, ensuring unique designs.

It is handmade, not mass-produced.

It is a traditional Indian craft, with roots in the Indus Valley Civilization.

What is Dokra Metal Craft?

- Dokra (Dhokra) is a non-ferrous metal casting technique, using the lost-wax casting method, which has been in practice for over 4,000 years.
- It is known for its primitive simplicity, unique folk motifs, and handcrafted designs without any joints.

Region Found In:

- Jharkhand, Chhattisgarh, Odisha, West Bengal, Telangana, Madhya Pradesh, Rajasthan, Tamil Nadu.
- Adilabad Dokra (Telangana) received the Geographical Indicator (GI) tag in 2018.

Features of Dokra Art:

- **Handcrafted Metalwork:** Made mainly from brass and copper-based alloys.
- **Intricate Designs:** Figures of elephants, horses, religious deities, lamps, jewellery, and tribal motifs.

Two Casting Methods:

- **Solid casting (South India)** – Uses a single wax piece to create the mould.
- **Hollow casting (Central and Eastern India)** – Uses a clay core and wax overlay.
- **No Reproduction:** Each piece is unique, as the mould is destroyed in the process.

History & Cultural Significance:

- **Origins:** Dates back to the Indus Valley Civilization (Mohenjo-daro's "Dancing Girl" figurine is an early example).
- **Traditional Practitioners:** Dhokra Damar tribes, originally from Odisha and West Bengal, later migrated across India.

#### 43. Solution: d)

Section 67 prohibits obscene material online.

The Community Standards Test replaced the Hicklin Test.

Obscenity laws apply to digital content.

About Obscenity Laws in India:

Issue of Obscenity:

- Obscenity laws in India aim to balance free speech with moral standards and prevent explicit content that corrupts public morality.
- With the rise of digital platforms, defining what constitutes obscenity online has become more complex.

Laws Governing Obscenity in India:

- Section 294 of the Bharatiya Nyaya Sanhita (BNS), 2023:
- Criminalizes the sale, import, export, or display of obscene material in any form, including electronic content.
- Defines obscenity as material appealing to prurient interests or that depraves and corrupts viewers.
- Punishment: Up to two years imprisonment and ₹5,000 fine for first-time offenders.
- Section 67 of the Information Technology Act, 2000:
- Punishes publishing/transmitting obscene material online.
- First-time offence: Up to 3 years imprisonment and ₹5 lakh fine.
- Indecent Representation of Women (Prohibition) Act, 1986:
- Bans indecent portrayal of women in any media.

Key Supreme Court Judgments on Obscenity:

- **Ranjit Udeshi v. State of Maharashtra (1964):**
- Applied the Hicklin Test, ruling Lady Chatterley's Lover obscene.
- Obscenity was judged by its potential to corrupt impressionable minds.

Aveek Sarkar v. State of West Bengal (2014):

- Shifted from the Hicklin Test to the Community Standards Test.
- Held that nudity alone does not make content obscene if it does not promote sexual depravity.

Supreme Court on College Romance Web Series (2024):

- Quashed obscenity charges against YouTube creators.
- Stated that vulgar language does not necessarily amount to obscenity unless it arouses sexual and lustful thoughts.

#### 44. Solution: a)

Statement 1 is correct: Einstein rings occur due to gravitational lensing, predicted by Einstein's General Theory of Relativity.

Statement 2 is correct: A nearly perfect alignment of the observer, lensing mass, and background source is necessary.

Statement 3 is incorrect: Dark matter plays a significant role in gravitational lensing, influencing the formation and intensity of Einstein Rings.

What is an Einstein Ring?

- An Einstein ring is a gravitational lensing

phenomenon where light from a distant galaxy bends around a massive celestial object, forming a ring-like structure.

- It was theoretically predicted by Albert Einstein's General Theory of Relativity (1915).

Features of Einstein Rings:

- Caused by Gravitational Lensing: A massive foreground galaxy distorts light from a background galaxy, creating a circular image.
- Highly Rare Phenomenon: Less than 1% of galaxies exhibit Einstein rings.
- Requires Precise Alignment: The observer, the lensing object, and the background source must be perfectly aligned.
- Not Visible to Naked Eye: Detected using high-powered telescopes like ESA's Euclid or NASA's Hubble Space Telescope.

Significance of Einstein Rings:

- Studies Dark Matter: Since dark matter does not emit light, gravitational lensing offers an indirect way to detect and map it.
- Enhances Understanding of Distant Galaxies: Einstein rings magnify and brighten faraway galaxies, revealing details that would otherwise be undetectable.
- Helps Measure Cosmic Expansion: Provides insights into how fast the universe is expanding and the distribution of matter across the cosmos.

#### 45. Solution: b)

Statement 1 is incorrect: The Tobin Tax applies only to foreign exchange transactions, not stock trading.

Statement 2 is correct: It was proposed by James Tobin in response to the Bretton Woods collapse.

Statement 3 is incorrect: India does not impose a Tobin Tax but has a Securities Transaction Tax (STT).

What is Tobin Tax?

- The Tobin Tax is a tax on foreign exchange transactions aimed at discouraging short-term speculative trading.
- It is a small levy (0.1%-0.5%) on currency conversions to reduce volatility in financial markets.

Origin and Economic Theory:

- Proposed in 1972 by James Tobin, a Nobel Prize-winning economist, in response to currency market fluctuations after the collapse of the Bretton Woods system.
- Aimed at "throwing sand in the wheels" of currency speculation to stabilize exchange rates.

Features of Tobin Tax:

- Applied on currency transactions to deter short-term speculation.
- Low tax rate to prevent market disruption.
- Revenue generated can be used for public welfare or development projects.

#### Positives and Negatives of Tobin Tax:

Aspect	Advantages	Disadvantages
Market Stability	Reduces speculative trading and volatility.	May lower market liquidity.
Revenue Generation	Can generate significant revenue for governments.	Difficult to implement uniformly across nations.
Currency Protection	Helps protect weaker currencies from speculative attacks.	May increase transaction costs for businesses and investors.
Fairer Global Economy	Limits financial power of hedge funds and big investors.	May push financial transactions to tax-free zones (offshore havens).

#### Does India Have a Tobin Tax?

- India does not directly impose a Tobin Tax on currency transactions.
- However, Securities Transaction Tax (STT), introduced in 2004, acts as a Tobin-like tax on stock market transactions.
- Foreign Portfolio Investments (FPIs) are also subject to taxation, indirectly influencing capital flows.

#### 46. Solution: c)

Ongole cattle are native to Andhra Pradesh, not Tamil Nadu.

They are highly heat-resistant and disease-tolerant.

The breed is valued internationally, especially in Brazil and the USA.

What is the Ongole Breed?

- Ongole cattle is a native Indian Bos Indicus breed known for its high strength, disease resistance, and heat tolerance.
- It has been historically used for agriculture, dairy, and breeding purposes, contributing to livestock economies.

Native Region & Distribution:

- Native to: Prakasam district, Andhra Pradesh, India.
- Found in: Villages around Guntur, Vinukonda, Narasaraopet, Ongole, Kandukur and along the Gundlakamma and Alluru rivers.
- Also known as the Nellore breed due to its historical association with Nellore district.

Key Features of Ongole Cattle:

Physical Traits:

- Large, muscular build with long limbs and short necks.
- Distinct hump in males, well-developed and erect.
- Coat Color: Mostly white or gray, with dark gray patches on head, hump, and knees.

- Horns: Short, stumpy, thick at the base and growing outward.
- Dewlaps: Fleshy, extending to the navel flap.

Temperament & Utility:

- Docile nature makes them easy to manage.
- Strong and powerful bulls, used for heavy plowing and transportation.
- Cows are moderate milk producers.

Speciality of Ongole Breed:

- High Heat Resistance: Can withstand harsh tropical climates, making it ideal for drought-prone areas.
- Genetic Purity: Recognized for strong immune system and low disease susceptibility.

Global Recognition:

- Highly valued in Brazil, USA, and Australia for crossbreeding and dairy farming.
- Brazilian-developed Ongole cow, Viatina-19, became the world's most expensive cow in 2025.

Historical Significance:

- Traces of Zebu (*Bos Indicus*) cattle, including Ongole breed, date back to Indus Valley Civilization (3000 BC).
- Rigvedic texts mention cattle as an essential part of socio-economic life.

#### 47. Solution: a)

Statement 1 is incorrect: Dokra uses brass and copper, not iron.

Statement 2 is incorrect: The lost-wax technique dates back to the Indus Valley Civilization.

Statement 3 is correct: It is practiced in West Bengal, Odisha, and Chhattisgarh.

What is Dokra Metal Craft?

- Dokra (Dhokra) is a non-ferrous metal casting technique, using the lost-wax casting method, which has been in practice for over 4,000 years.
- It is known for its primitive simplicity, unique folk motifs, and handcrafted designs without any joints.

Region Found In:

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- Adilabad Dokra (Telangana) received the Geographical Indicator (GI) tag in 2018.

Features of Dokra Art:

- Handcrafted Metalwork: Made mainly from brass and copper-based alloys.
- Intricate Designs: Figures of elephants, horses, religious deities, lamps, jewellery, and tribal motifs.

Two Casting Methods:

- Solid casting (South India) – Uses a single wax piece to create the mould.
- Hollow casting (Central and Eastern India) – Uses a clay core and wax overlay.

- No Reproduction: Each piece is unique, as the mould is destroyed in the process.

History & Cultural Significance:

- Origins: Dates back to the Indus Valley Civilization (Mohenjo-daro's "Dancing Girl" figurine is an early example).
- Traditional Practitioners: Dhokra Damar tribes, originally from Odisha and West Bengal, later migrated across India.

#### 48. Solution: c)

Statement 1 is correct: Olive Ridley turtles are listed under Schedule I of the Wildlife Protection Act, 1972, granting them the highest level of protection in India.

Statement 2 is correct: They are included in Appendix I of CITES, meaning international trade in Olive Ridley turtles and their products is prohibited.

Statement 3 is correct: UNCLOS obligates countries to conserve and manage marine species, indirectly protecting sea turtles.

Statement 4 is incorrect: Ramsar Convention deals with wetlands, not marine turtle conservation.

#### 49. Solution: b)

Statement 1 is correct because quantum teleportation enables the transfer of quantum states over long distances, forming the basis of a future global quantum internet. This allows for ultra-secure communication by leveraging quantum entanglement to prevent eavesdropping.

Statement 2 is incorrect as quantum teleportation does not violate Einstein's theory of relativity. While quantum entanglement appears to link particles instantaneously, classical communication is still required to complete the teleportation process, ensuring no faster-than-light transfer of usable information.

Statement 3 is correct because quantum teleportation facilitates transmitting quantum information between quantum computers. This enables distributed quantum computing, where multiple quantum processors share data efficiently without data loss. It is fundamental for developing scalable quantum networks and advancing quantum cryptography, computing, and secure communications. These breakthroughs could revolutionize secure data exchange and cloud-based quantum computing in the near future.

#### 50. Solution: b)

Option (b) is correct because India's repo rate applies to short-term loans from the RBI to commercial banks, where banks pledge government securities as collateral. In contrast, the U.S. Fed Funds Rate applies to overnight interbank lending, meaning it governs how banks lend to each other, not borrowing from the Federal Reserve directly.

Option (a) is incorrect because both rates are controlled by their respective central banks—the RBI in India and the Federal Reserve in the U.S.



Option (c) is incorrect because, while both influence liquidity and interest rates, the mechanics of their implementation differ.

Option (d) is incorrect as the repo rate applies to all scheduled banks in India, not just government-owned banks.

### 51. Solution: D

Reciprocal tariffs often lead to protectionism, as countries retaliate by imposing counter-tariffs, escalating trade tensions.

Example: The U.S.-China trade war (2018-2020), where both nations imposed reciprocal tariffs on each other's exports, significantly disrupting global trade.

This weakens WTO-led negotiations, rather than enhancing them, and often results in market uncertainty rather than reducing price volatility.

What is a Reciprocal Tariff?

- A tax on imports that mirrors the tariff charged by a country on US exports.
- Objective: To create a "fair" trading system by equalizing tariffs globally.

How Do Reciprocal Tariffs Work?

- Tariff Matching: US will impose the same tariff rates that other countries apply to US goods.
- Subsidy Consideration: The US will factor in export subsidies and incentives given by countries like India before deciding the final tariff.
- Elimination of Differential Treatment: Developing nations, including India, will no longer get tariff relaxations, unlike in the past under WTO rules.

How Will Reciprocal Tariffs Be Calculated?

- Comprehensive Assessment: The US Trade Department will evaluate all direct and indirect support (e.g., tax breaks, subsidies) that other countries offer to their exporters.
- Expected Tariff Rise: India, being a subsidy-driven economy, could face higher tariff barriers for exports like textiles, pharmaceuticals, and automobiles.
- Deadline: Final tariff rates will be determined by April 2025.

Impact on India

- Exports Will Become Costlier: US may increase tariffs on Indian goods, making textiles, pharmaceuticals, and auto parts less competitive.
- Trade Deficit Will Shrink: India may import more from the US (like defense equipment, oil, and gas) to balance trade, reducing its \$38 billion trade surplus with the US.
- Rupee May Weaken: More imports mean higher demand for US dollars, leading to a weaker rupee, increasing India's import bill.
- Atmanirbhar Bharat May Suffer: India's self-reliance push may slow down if the US pressures India to buy American goods.

- Impact on Foreign Investments: US firms may push for local production in India to avoid high tariffs, boosting FDI (Foreign Direct Investment).

### 52. Solution: A

Statement 1 is incorrect: The Hangul is a subspecies of the Central Asian Red Deer (*Cervus hanglu hanglu*) and is endemic to Kashmir, not the Western Ghats.

Statement 2 is correct: The Hangul is listed as Critically Endangered (CR) on the IUCN Red List due to habitat loss, poaching, and declining population.

Statement 3 is correct: While some stray populations have been reported, the Dachigam National Park (Jammu & Kashmir) remains the major habitat of Hangul Deer in India.

What is Hangul Deer?

- A subspecies of the Central Asian red deer (*Cervus hanglu hanglu*), endemic to Kashmir and northern Himachal Pradesh.
- The state animal of Jammu and Kashmir and the only surviving Asiatic subspecies of the Red Deer family.

Habitat & Protected Areas:

- Found in dense riverine forests, valleys, and mountainous regions of Jammu & Kashmir and northern Himachal Pradesh.

Key Protected Areas:

- Dachigam National Park (J&K) – The primary habitat of Hangul deer.
- Tral Wildlife Sanctuary (J&K) – Offers additional protection.

IUCN Status:

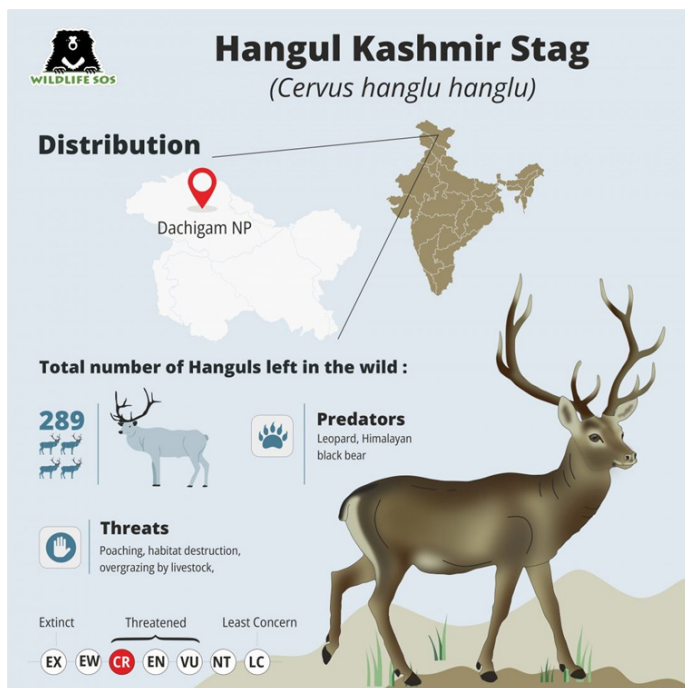
- Listed as Critically Endangered (CR) on the IUCN Red List due to rapid population decline.
- Population has fallen from 3,000-5,000 in the 1940s to just 289 in 2023.

Key Features of Hangul Deer

- Large Antlers: Males possess impressive multi-tined antlers with 11-16 points.
- Seasonal Mating & Birth Patterns: Mating from October to December, birthing in April-May.
- Herbivorous Diet: Feeds on grasses, leaves, and forest vegetation.

Reasons Behind Population Decline:

- Habitat Destruction: Deforestation and land encroachment have reduced their natural habitat.
- Overgrazing: Competition with livestock reduces available food resources.
- Poaching & Illegal Hunting: Hangul is targeted for its antlers and meat.
- Human Disturbance: Grazing, herder movements, and tourism disrupt mating and birthing cycles, increasing stress levels.
- Climate Change: Affects food availability and habitat conditions, worsening survival rates.



### 53. Solution: D

The Centers for Disease Control and Prevention (CDC) classifies Sudan Virus as a Category A Bioterrorism Agent due to its high fatality rate (40-60%), lack of a licensed vaccine or antiviral treatment, and potential for epidemic spread.

Option (a) is incorrect because Sudan Virus has low mutation rates compared to RNA viruses like influenza.

Option (b) is incorrect because Sudan Virus primarily spreads through direct contact with bodily fluids, not via aerosols.

Option (c) is incorrect because Sudan Virus has spread beyond Sudan, including outbreaks in Uganda and other African nations.

About Sudan Virus:

Origin:

- First identified in 1976 during an outbreak in southern Sudan (now South Sudan).
- Belongs to the Orthoebolavirus genus, the same family as the Ebola virus.

Where is it Found?

- Predominantly found in sub-Saharan Africa, with previous outbreaks in Sudan and Uganda.
- Spread through direct contact with infected bodily fluids, contaminated objects, or infected animals.

Features of Sudan Virus

- **Highly Fatal:** Fatality rate ranges from 40% to 60%, with the 2022 Uganda outbreak recording a 47% death rate.
- **No Approved Vaccine or Treatment:** Unlike Ebola, Sudan virus lacks an effective vaccine or antiviral treatment.
- **Transmission through Body Fluids:** Spread through human-to-human contact, contaminated surfaces, or zoonotic spillovers.

- **Severe Symptoms:** Initial fever, body aches, fatigue, progressing to diarrhea, vomiting, and internal bleeding.
- **Requires Isolation & Contact Tracing:** Laboratory testing is crucial for diagnosis, and strict containment is essential to prevent outbreaks.

How is it Similar to Ebola?

- Both Sudan virus and Ebola belong to the Orthoebolavirus family, causing severe hemorrhagic fever.
- Symptoms overlap, including fever, body aches, organ failure, and internal bleeding.
- Laboratory testing is required to differentiate between Sudan virus and Ebola infections.
- Both diseases spread through direct contact and require urgent containment measures.
- Currently, there are no approved vaccines or antiviral treatments for Sudan Virus Disease (SVD).

### 54. Solution: A

JBG is primarily a senior scientist grant, providing funding for established researchers to conduct advanced research in multiple disciplines.

It does not fund PhD students directly (eliminating option b).

While collaborations with foreign institutions are allowed, they are not the primary objective (eliminating option c).

The grant focuses on research, not startup incubation (eliminating option d).

What is the J. C. Bose Grant?

- A prestigious research funding initiative by ANRF to recognize and support senior Indian scientists in diverse scientific and technological domains.

Established by:

- Launched by the Anusandhan National Research Foundation (ANRF), the apex body directing scientific research and innovation in India.

Aim:

- To promote high-quality research and advance technological innovations by providing extramural funding to leading scientists and engineers.

Eligibility:

- Open to active senior Indian scientists holding a Professor-level position or equivalent at recognized Indian institutions/universities.
- Candidates must have proven excellence in research, evidenced by publications, patents, technology transfers, and awards.
- The grant can be availed until the age of 68.

Key Features:

- **Funding Amount:** Provides 25 lakh per year for five years to support research activities.
- **Institutional Support:** Additional 1 lakh per year granted to the implementing institution.

- **Multi-Disciplinary Scope:** Covers science, technology, agriculture, medicine, humanities, and social sciences at S&T interfaces.
- **Superannuation Clause:** If the Principal Investigator (PI) retires, the grant can continue if the host institution agrees to retain them.
- **Enhancing R&D Ecosystem:** Strengthens India's research infrastructure and innovation landscape.

### 55. Solution: A

Statement 1 is correct: The NSDC is a not-for-profit public limited company set up under the Ministry of Skill Development & Entrepreneurship (MSDE) to enhance skill development in India.

Statement 2 is incorrect: NSDC operates on a Public-Private Partnership (PPP) model, where 49% of its stake is held by the government and 51% by private sector players. It is not entirely funded by the government.

Statement 3 is correct: NSDC acts as a market-maker by financing skill training centers, supporting private institutions, and facilitating training in emerging industries.

What is NSDC?

- A not-for-profit public limited company established to enhance skill development in India.
- Operates under the Ministry of Skill Development & Entrepreneurship (MSDE).

Established In:

- Founded on July 31, 2008, as a Public-Private Partnership (PPP) model under Section 25 of the Companies Act, 1956 (now Section 8 under the 2013 Act).

Shareholding Structure

- 49% government stake and 51% private sector participation, ensuring a collaborative skill development framework.

Aim of NSDC:

- To bridge the skill gap by providing industry-relevant training and enhancing workforce readiness.
- To support enterprises, start-ups, and training organizations through funding and concessional loans.

Key Functions of NSDC:

- **Skill Development & Training:** Provides vocational training and certification in emerging technologies to align with industry needs.
- **Apprenticeship & Job Training:** Implements NAPS with 5 million apprentices, disbursing ₹100,250 million for skill-based learning.
- **Digital & Remote Skilling:** Runs Skill India Digital Hub (SIDH) with 7,100 courses in 23 languages, reaching 30 crore candidates.
- **Job & Career Support:** NSDC JobX connects job seekers with employers, aiding resume building, career coaching, and placements for 4 million

candidates.

### 56. Solution: B

Statement 1 is correct: The India-USTRUST Initiative focuses on strengthening supply chains in critical minerals, pharmaceuticals, and advanced materials, aligning with India's self-reliance goals.

Statement 2 is incorrect: TRUST is not linked to the Sagarmala Programme, which is an Indian maritime infrastructure initiative. TRUST is a strategic technology partnership between India and the US.

Statement 3 is correct: One of the major objectives of TRUST is to reduce India's reliance on China for rare earth elements (REEs) and semiconductors by diversifying global supply chains.

About India-US TRUST Initiative:

What is the TRUST Initiative?

- **Transforming Relationship Utilizing Strategic Technology (TRUST)** is a bilateral agreement to enhance cooperation in critical minerals, pharmaceuticals, and advanced materials.
- Builds on India's participation in the Minerals Security Partnership (MSP) and the Minerals Security Finance Network (MSFN).
- Aims to diversify supply chains, reduce dependence on China, and facilitate technology transfer.

How Will the TRUST Initiative Work?

**Strengthening Critical Minerals Supply Chains:**

- Focus on lithium, rare earth elements (REEs), and advanced materials for sectors like defense, semiconductors, and energy storage.
- India to increase mineral exploration and processing capacity.
- US to facilitate investments and technology transfers.

**Boosting Pharma Sector & API Production:**

- Collaboration to reduce India's dependence on China for Active Pharmaceutical Ingredients (APIs).
- Development of alternative supply chains for critical minerals used in pharmaceuticals.
- **Technology Transfer & Export Control Reduction:**
- Removing barriers in technology transfer between India and the US.
- Addressing export restrictions on high-tech materials and components.

**Innovation Across Strategic Sectors:**

- Catalyzing R&D in defense, AI, quantum computing, semiconductors, space, and energy.
- Engaging governments, academia, and private industries to drive innovation.

### 57. Solution: D

PARAS-2 uses the radial velocity (RV) method to detect exoplanets by measuring Doppler shifts in a star's light due to gravitational tugs from an orbiting planet.



Option (a) is incorrect: The transit method (analyzing brightness dips when a planet crosses a star) is used by space telescopes like Kepler and TESS, not by PARAS-2.

Option (b) is incorrect: X-ray spectroscopy is used for studying high-energy cosmic events, not exoplanets.

Option (c) is incorrect: Infrared spectroscopy is used for exoplanet atmosphere studies, which is not PARAS-2's focus.

About PARAS-2 Spectrograph:

What is PARAS-2?

- High-resolution Radial Velocity (RV) Spectrograph, used for exoplanet detection and mass measurement.

Built by:

- Developed by Physical Research Laboratory (PRL), Ahmedabad, and installed at the 2.5-meter telescope at Mt. Abu Observatory.

Functions & Features:

- Exoplanet Detection: Measures minute stellar wobbles to confirm planetary presence.
- Precision Mass Measurement: Determines exoplanet mass using radial velocity technique.
- Asia's Highest-Resolution RV Spectrograph: Provides stabilized and accurate measurements for astronomical studies.
- Speckle Imaging Capability: Aids in high-resolution planetary system validation.

## 58. Solution: C

Statement 1 is correct: Higher tariffs will increase costs for Indian exporters, making goods like textiles, pharmaceuticals, and automobiles less competitive in the U.S. market.

Statement 2 is correct: To avoid high tariffs, U.S. companies may set up local manufacturing units in India, boosting FDI in sectors like defense, energy, and technology.

Statement 3 is incorrect: Reciprocal Tariffs often bypass WTO mechanisms and lead to unilateral trade actions, weakening WTO dispute resolution processes.

Statement 4 is correct: India's trade surplus with the U.S. (currently around \$38 billion) is likely to decline as the U.S. increases tariffs on Indian goods, reducing exports.

## 59. Solution: B

Statement 1 is correct: NSDC provides concessional loans and funding support to skill training organizations, especially under initiatives like PMKVY and NAPS (National Apprenticeship Promotion Scheme).

Statement 2 is incorrect: While NSDC facilitates skill training, the assessment and certification process is handled by independent third-party organizations, often overseen by Sector Skill Councils (SSCs).

Statement 3 is correct: NSDC has established Sector

Skill Councils (SSCs), which work with industries to define skill standards, develop curricula, and certify trainers.

## 60. Solution: B

Statement 1 is correct: Sudan Virus spreads through direct contact with infected bodily fluids, contaminated objects, and animals (like bats or primates).

Statement 2 is incorrect: Sudan Virus has an incubation period of 2-21 days, similar to Ebola. It cannot be detected within 24 hours of exposure, as symptoms develop gradually.

Statement 3 is correct: Fruit bats (Pteropodidae family) are suspected to be the natural reservoir host, though direct evidence remains inconclusive.

## 61. Solution: D

The PM-AASHA scheme includes three major components:

- Price Support Scheme (PSS) – Direct procurement of pulses, oilseeds, and copra at Minimum Support Price (MSP).
- Price Deficiency Payment Scheme (PDPS) – Farmers receive direct payments for the difference between market price and MSP.
- Market Intervention Scheme (MIS) – Government intervention for perishable horticultural crops to prevent distress selling.

Option (d) is incorrect: e-NAM is a separate initiative aimed at creating a unified online trading platform for agricultural commodities, not part of PM-AASHA.

About Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) Scheme:

- What it is: An umbrella scheme aimed at ensuring remunerative prices to farmers through effective procurement operations and price support mechanisms.
- Ministry: Administered by the Ministry of Agriculture & Farmers' Welfare.
- Implementing Agency: Implemented through Central Nodal Agencies (NAFED, NCCF) along with State Governments.

Components:

- Price Support Scheme (PSS): procures pulses, oilseeds, and copra at MSP through NAFED & NCCF, covering 25% of national production (except 100% for Tur, Urad, Masur in 2024-25).
- Price Stabilization Fund (PSF): Maintains buffer stock of pulses and onions to stabilize prices, prevent hoarding, and ensure affordable supply to consumers.
- Price Deficit Payment Scheme (PDPS): Farmers receive direct compensation for the difference between MSP & market price, with coverage extended to 40% of oilseed production for four months.
- Market Intervention Scheme (MIS): Provides

remunerative prices for perishable horticulture crops, covering 25% of production, with direct payment to farmers instead of physical procurement.

Key Features:

- Procurement at MSP: Ensures farmers receive fair prices for their produce.
- Self-Sufficiency in Pulses: Govt. commits 100% procurement of Tur, Urad, and Masur for the next four years.
- Reduction in Import Dependence: Enhances domestic production and minimizes reliance on pulses imports.
- Direct Farmer Registration: Pre-registered farmers sell directly at mandated procurement centers.
- Market Price Stabilization: Prevents price volatility and ensures affordable prices for consumers.

## 62. Solution: C

Option (c) is correct: A DDoS attack overwhelms a target server, website, or network with high traffic from multiple compromised devices (botnets), causing service disruptions.

Option (a) is incorrect: Exploiting zero-day vulnerabilities is more associated with Advanced Persistent Threats (APT) than DDoS.

Option (b) is incorrect: Remote access hacking is a different type of cyber attack (e.g., Remote Access Trojans).

Option (d) is incorrect: Encrypting files for ransom is associated with ransomware attacks, not DDoS.

What is a DDoS Attack?

- A Distributed Denial of Service (DDoS) attack floods a server or network with excessive traffic, causing service disruptions.
- It leverages a botnet network of compromised devices—to send overwhelming requests to the target system.

How Does a DDoS Attack Work?

- Botnet Formation: Hackers infect multiple devices with malware, converting them into bots.
- Traffic Overload: The botnet directs massive fake requests to the target, exhausting bandwidth or processing power.
- Service Disruption: Legitimate users experience slowdowns or complete service failure.
- Diversion Tactic: Attackers may use DDoS as a smokescreen for data breaches or malware deployment.

How to Counter a DDoS Attack?

- Traffic Filtering: Identify and block malicious requests using AI-based monitoring.
- Rate Limiting: Restrict the number of requests per user to prevent overload.
- Bot Detection Tools: Use CAPTCHA and behavioral analysis to block automated attacks.
- Robust Authentication: Strengthen login security

to prevent unauthorized access.

- Incident Response Teams: Establish cybersecurity teams to monitor, detect, and mitigate threats.

## 63. Solution: A

Statement 1 is correct: High fecal coliform levels indicate organic waste pollution, which increases BOD, leading to oxygen depletion in water bodies.

Statement 2 is correct: Fecal coliform bacteria suggest the presence of harmful enteric pathogens such as *E. coli*, *Salmonella*, or *Vibrio cholerae*.

Statement 3 is incorrect: UV radiation and chlorination are effective in killing fecal coliform bacteria, making water safe for drinking.

About Fecal Coliform:

What it is?

- A subgroup of coliform bacteria that primarily originate from the intestinal tracts of warm-blooded animals, including humans.
- Limit: The Central Pollution Control Board (CPCB) standards have set a permissible limit of 2,500 units of faecal coliform per 100 ml of water, while for drinking water, *E. coli* must be absent.
- Types of Bacteria: Includes *Escherichia coli* (*E. coli*), with certain strains like *E. coli* O157:H7 being harmful and capable of causing intestinal infections.

What its Presence Indicates?

- Sewage contamination of water sources.
- Potential presence of disease-causing pathogens such as those responsible for typhoid, hepatitis A, and gastroenteritis.
- Poor waste management, leakage from septic systems, or agricultural runoff polluting water bodies.

Impacts of Fecal coliform on BOD and COD:

- BOD Increase: Fecal coliform bacteria decompose organic waste, consuming dissolved oxygen and raising Biochemical Oxygen Demand (BOD), leading to oxygen depletion and aquatic life suffocation.
- COD Increase: Contaminants from sewage and industrial discharge raise Chemical Oxygen Demand (COD), indicating non-biodegradable pollutants, lowering water quality and harming ecosystems.

## 64. Solution: C

Statement 1 is incorrect: DICGC provides insurance coverage of only 5 lakh per depositor per bank, not 10 lakh.

Statement 2 is incorrect: Foreign banks operating in India are covered under DICGC if they are licensed under the RBI.

Statement 3 is correct: DICGC covers all deposit types, including savings, FDs, current, and recurring deposits.

About Deposit Insurance and Credit Guarantee Corporation (DICGC):

What it is?

- DICGC is a subsidiary of the Reserve Bank of India (RBI) that provides deposit insurance to bank depositors, ensuring the safety of their money in case of bank failures.

History:

- First considered in 1948 after banking crises in Bengal and revisited in 1960 after the collapse of Palai Central Bank & Laxmi Bank.
- The Deposit Insurance Corporation Act, 1961, came into force on January 1, 1962.
- Merged with the Credit Guarantee Corporation in 1978 to form DICGC under the Ministry of Finance.
- Ministry: Operates under the Department of Financial Services, Ministry of Finance.
- Aim: To protect depositors' funds and maintain public confidence in the banking system.

Functions:

- Insures deposits of banks against failure.
- Provides credit guarantees to priority sector lending institutions.
- Monitors bank financial health and steps in when required.

Features of Deposit Insurance:

- Existing Limit: Each depositor insured up to ₹5 lakh (including principal and interest) per bank, per depositor.
- Coverage: Includes commercial banks, regional rural banks, foreign banks operating in India, and cooperative banks.

What is Covered?

- Savings accounts, fixed deposits, current accounts, and recurring deposits.

What is NOT Covered?

- Deposits of foreign governments, central/state governments, and inter-bank deposits.
- Deposits with State Land Development Banks.
- Deposits outside India and exempted by RBI approval.

Multiple Branches in Same Bank?

- Deposits across different branches of the same bank are clubbed under one insurance cover.

## 65. Solution: D

The 2023 Act replaced the earlier system where the President appointed the CEC based on the recommendation of the government.

The new Selection Committee includes:

- Prime Minister
- A Union Cabinet Minister
- Leader of Opposition in Lok Sabha

Option (c) is incorrect as there is no provision for

direct election of the CEC by Parliament.

About Chief Election Commissioner (CEC) of India:

What it is?

- The Chief Election Commissioner (CEC) heads the Election Commission of India (ECI), ensuring free and fair elections.
- Article: Governed by Article 324 of the Indian Constitution, which vests the superintendence, direction, and control of elections in the Election Commission.

Appointment Process:

- Previously: CEC was appointed by the President on the recommendation of the Prime Minister.
- Under the 2023 Act: A Selection Committee comprising the Prime Minister, a Union Cabinet Minister, and the Leader of the Opposition in the Lok Sabha recommends candidates.
- A Search Committee, chaired by the Law Minister, shortlists names for consideration.

Eligibility: The new Act now specifies that candidates must:

- Be persons of integrity
- Have knowledge and experience in the management and conduct of elections
- Be or have been a secretary (or equivalent) to the government
- Term: Six-year tenure or until the age of 65 years, whichever is earlier.
- Service Conditions: The salary and conditions of service of the CEC and ECs will be equivalent to that of Cabinet Secretary.
- Removal: The CEC may be removed in the same manner as applicable for a Supreme Court judge. ECs may only be removed upon the recommendation of the CEC.

Powers and Functions:

- Conducts free and fair elections for Lok Sabha, Rajya Sabha, State Assemblies, and the President & Vice President of India.
- Regulates political parties, monitors election funding, and enforces the Model Code of Conduct (MCC).
- Supervises voter registration, prepares electoral rolls, and ensures smooth voting processes.
- Has the authority to disqualify candidates for electoral malpractices and cancel elections if irregularities occur.
- Advises the President and Governors on election-related matters.

## 66. Solution: B

Statement 1 is correct: Parambikulam is home to Kannimara Teak, one of the largest and oldest teak trees in the world.

Statement 2 is correct: The reserve is part of the Anamalai Hills Conservation Landscape, ensuring



biodiversity connectivity.

Statement 3 is incorrect: The Toto Tribe is found in West Bengal, not Kerala. The Kadar, Malasar, Muduvar, and Mala Malasar tribes inhabit Parambikulam.

About Parambikulam Tiger Reserve:

- Location: Situated in Palakkad and Thrissur districts of Kerala, between the Anamalai Hills and Nelliampathy Hills in the Western Ghats.
- Area: Covers 643.66 sq. km, including the Parambikulam Wildlife Sanctuary (declared in 1973, expanded in 1984) and later notified as a Tiger Reserve in 2010.

Flora:

- Comprises evergreen, moist and dry deciduous forests, and grasslands.
- Home to endangered medicinal plants like *Coscinium fenestratum* and *Utleria salicifolia* (IUCN Red-listed).

Fauna:

- Mammals: Lion-tailed macaques, Malabar giant squirrel, flying squirrel, leopards, elephants, Nilgiri langurs, smooth-coated otters.
- Amphibians & Fish: Endemic species like *Tomopterna parambikulamana* (frog) and *Garra surendranathanii* (sucker fish).
- Tribes Found: Indigenous tribes like Kadar, Malasar, Muduvar, and Mala Malasar inhabit the reserve in six colonies.

Conservation Significance:

- A UNESCO World Heritage Site under the Western Ghats, Anamalai Sub-Cluster.
- Implements Project Tiger under the National Tiger Conservation Authority (NTCA).

### 67. Solution: C

APEDA is responsible for export promotion and market development but does not formulate domestic agricultural pricing policies (which falls under the Ministry of Agriculture and Farmers' Welfare and the Commission for Agricultural Costs and Prices (CACP)).

Options (a), (b), and (d) are correct: APEDA monitors exports, provides financial aid, and implements traceability systems like ANARNET for pomegranates and Hortinet for fruits and vegetables.

About Agricultural and Processed Food Products Export Development Authority (APEDA):

- Origin: Established in 1986 under the APEDA Act to promote agricultural exports.
- Ministry: Functions under the Ministry of Commerce and Industry, Government of India.
- Aim: Enhance India's agricultural exports, improve market access, and ensure quality standards in global trade.

Functions and Powers:

- Market Development: Expands market access for

Indian agri-products globally.

- Export Promotion: Facilitates agricultural trade through initiatives like ANARNET (traceability system).
- Infrastructure Expansion: Supports post-harvest infrastructure, cold chain logistics, and quality control.
- Policy Implementation: Implements government schemes to boost farmer income and reduce post-harvest losses.

### 68. Solution: B

Statement 1 is incorrect: The scheme only covers pulses, oilseeds, and copra, not all crops under MSP (e.g., cereals like wheat and rice are excluded).

Statement 2 is correct: PM-AASHA reduces over-reliance on physical procurement by providing price deficiency payments.

Statement 3 is correct: NAFED (National Agricultural Cooperative Marketing Federation of India) and NCCF (National Cooperative Consumers' Federation of India) play a key role in procurement and price stabilization under the scheme.

### 69. Solution: B

Statement 1 is incorrect: APEDA is a statutory body under the Ministry of Commerce and Industry, not the Ministry of Agriculture.

Statement 2 is correct: APEDA regulates organic exports under the National Programme for Organic Production (NPOP).

Statement 3 is correct: APEDA monitors dairy product exports, but not under the Essential Commodities Act—instead, it works under the APEDA Act, 1986.

### 70. Solution: A

Statement 1 is correct: The CEC's tenure is six years or until the age of 65, whichever is earlier, as per the 2023 Act.

Statement 2 is correct: The CEC can be removed only through a process similar to the impeachment of Supreme Court judges, requiring a two-thirds majority in both Houses of Parliament.

Statement 3 is incorrect: Under the 2023 Act, the CEC and Election Commissioners (ECs) have the same salary as the Cabinet Secretary, not a Union Cabinet Minister.

### 71. Solution: B

The first statement is correct, as the NHA framework adheres to the System of Health Accounts (SHA) 2011 guidelines, facilitating a standardized methodology for tracking health expenditure.

The second statement is also correct, as this alignment with international standards helps in comparing healthcare spending across countries, improving transparency and accountability.

The third statement is incorrect because the NHA

framework is not limited to pandemic-related costs but covers the overall financial structure of healthcare, making it a comprehensive tool for evaluating all health expenditures.

## 72. Solution: A

Mount Erebus is located on Ross Island, Antarctica. It is the southernmost active volcano on Earth, known for its persistent activity despite the extreme cold conditions.

## 73. Solution: B

The first statement is correct. The Greyhounds force, established by Andhra Pradesh, is a highly trained special forces unit specializing in guerrilla warfare tactics to counter the Naxalite threat.

The second statement is also correct. The Aspirational Districts Programme focuses on developing underdeveloped regions, including areas affected by Naxalism, by improving key sectors such as healthcare, education, and infrastructure.

The third statement is incorrect because the Unlawful Activities (Prevention) Act (UAPA) does classify Naxalite groups as terrorist organizations, allowing for swift legal action against them.

## 74. Solution: A

The first and second statements are correct. Elephants are classified as Endangered on the IUCN Red List, and under the Wildlife (Protection) Act, 1972, they are listed in Schedule I, providing them the highest level of protection.

The third statement is incorrect because elephants are included in Appendix I of CITES, not Appendix II, which prohibits international trade except in rare circumstances.

## 75. Solution: A

Statement 1 is correct because Article 14 ensures equality before the law and equal protection of the law. Statement 2 is also correct, as Article 15 prohibits discrimination on specific grounds, ensuring fairness and equal opportunity for all citizens.

However, Statement 3 is incorrect. Article 23 prohibits both bonded and forced labor, as well as human trafficking, ensuring protection from exploitation. This provision is especially relevant for vulnerable communities, including prisoners, who may be subject to exploitation or coercive labor practices in certain instances.

## 76. Solution: C

- The Gulf of Mannar is located between Tamil Nadu, India, and the northern part of Sri Lanka, making Statement 1 correct.
- It is renowned for its rich marine biodiversity, including coral reefs, making it an important ecological zone, which validates Statement 2.
- Moreover, its proximity to international shipping routes in the Indian Ocean gives it strategic

military importance, making Statement 3 correct.

- This region has been a focal point of conservation efforts, including the establishment of the Gulf of Mannar Biosphere Reserve, aimed at protecting its unique marine ecosystem.

## 77. Solution: A

The Sammakka-Saralamma Temple inside the sanctuary is of great religious significance, and it hosts annual religious gatherings. However, the temple is dedicated to the deities Sammakka and Saralamma, not Shiva, making statement 3 incorrect.

## 78. Solution: c)

- The Laccadive Sea is located between the southwestern coast of India and the Maldives, which makes Statement 1 correct.
- It is a crucial sea route for maritime trade between Europe, Asia, and the Middle East, particularly through the Suez Canal, validating Statement 2.
- However, Statement 3 is incorrect because the Laccadive Sea is known for its rich biodiversity, including coral reefs, making it ecologically significant. Thus, the region is a focus for marine conservation efforts, particularly in and around the Lakshadweep Islands.

## 79. Solution: d)

Statement 1 is correct. The new technique employs high-energy ultrasound to break off small portions of tissue and turn them into droplets that contain molecular markers like RNA, DNA, and proteins. These droplets are released into the bloodstream, where they can be analyzed to identify cancer types.

Statement 2 is incorrect because the technique is non-invasive, reducing the need for procedures like biopsies. It detects cancer through the biomarkers found in the blood, rather than requiring direct tissue samples.

Statement 3 is correct. The method increases the concentration of detectable biomarkers by over 100 times, improving the sensitivity and accuracy of early cancer detection.

## 80. Solution: C

Minicoy Island is indeed the southernmost island in the Lakshadweep group, making Statement 1 correct.

The Eight Degree Channel separates Minicoy from the Maldives, and the Nine Degree Channel separates Minicoy from the rest of the Lakshadweep Islands, making Statements 2 and 3 correct.

These channels play an important role in maritime trade and the strategic positioning of India in the Indian Ocean. Additionally, Minicoy is culturally unique within the Lakshadweep group, with its distinct language and traditions, highlighting the diverse nature of India's island territories.

## 81. Solution: b)

Statements 1 and 2 are correct. The Strait of Hormuz connects the Persian Gulf to the Gulf of Oman, and it is one of the most critical chokepoints for global oil

shipments, with a large volume of oil passing through it daily.

Statement 3 is incorrect because the strait is located between the Arabian Peninsula (Oman, UAE) and Iran, not the Horn of Africa.

## 82. Solution: a)

Statement 2 is incorrect.

Statement 1 is correct: over 75% of rare disease cases in India affect children.

Statement 2 is incorrect because most patients with rare diseases do not survive into adulthood due to a lack of treatment.

Statement 3 is correct: the National Policy for Rare Diseases 2021 provides financial assistance for treating rare diseases.



## 83. Solution: b)

Statement 1 is correct as FNDs are used in high-resolution imaging due to their ability to maintain

stability under light and in harsh conditions.

Statement 2 is also correct, as FNDs are sensitive to electric fields, making them useful in sensor applications.

Statement 3 is incorrect because FNDs are not being explored as a replacement for traditional energy sources in renewable energy technologies.

## 84. Solution: b)

Superconductors are used in MRI machines due to their ability to carry large amounts of current without energy loss (statement 1).

High-temperature superconductors do require temperatures below  $-100^{\circ}\text{C}$  to function (statement 3).

Magnetic levitation trains (maglev) use superconductors to achieve frictionless, high-speed transportation (statement 4).

However, superconductors are not yet widely used in electrical grids due to the difficulty of maintaining the required temperatures and costs (statement 2 is incorrect).

## 85. Solution: d)

In forensic science, age estimation is crucial in identifying individuals and is typically done using methods such as ossification tests, which analyze bone development, and radiographic techniques like X-rays to assess bone maturity. The epigenetic clock technique is a newer method that estimates biological age by analyzing DNA methylation patterns. However, blood type analysis is not used to estimate age, as it provides information only about a person's blood group, not their age.

## 86. Solution: a)

Statement 1 is incorrect because the Prime Minister does not play a role in the appointment of the CJI. The appointment is made based on the recommendation of the outgoing CJI, as specified in the Memorandum of Procedure.

Statement 2 is incorrect because the President typically follows the recommendation of the outgoing CJI, and rejecting it would be against established conventions unless there are compelling reasons, which have rarely occurred.

Statement 3 is correct because the Memorandum of Procedure (MoP) serves as the guideline document for the appointment of the CJI, ensuring a systematic and transparent process. The MoP outlines the steps, including the recommendation by the outgoing CJI, which the President adheres to when making the appointment.

## 87. Solution: c)

Statement 1 is incorrect because the Mekong is Asia's third-longest river, not the longest (the Yangtze River is the longest in Asia).

Statement 2 is incorrect because the Mekong River flows into the South China Sea, not the Bay of Bengal.



Statement 3 is incorrect because the Mekong River is not navigable year-round for large vessels due to its natural barriers and seasonal changes.

**88. Solution: d)**

Statement 1 is correct because the Citizenship Act, 1955 explicitly bars illegal immigrants—those entering without valid documents or overstaying beyond the permitted period—from obtaining citizenship.

Statement 2 is correct, as Section 6A was introduced after the Assam Accord in 1985 to manage the issue of large-scale illegal migration into Assam post the Bangladesh Liberation War.

Statement 3 is correct because citizenship is dealt with under Part II of the Constitution, and related matters fall under the Union List, which is managed by the central government.

**89. Solution: b)**

Statement 1 is correct because the Paris Convention for the Protection of Industrial Property (1883) was among the first international agreements to recognize the importance of Geographical Indications (GIs).

Statement 2 is also correct, as GIs are protected under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), a part of the World Trade Organization (WTO) framework.

Statement 3 is incorrect because the Madrid Agreement is focused on international trademark registration, not solely on GIs. The Lisbon Agreement, on the other hand, deals with the protection of appellations of origin, a type of GI.

**90. Solution: c)**

ADR is a non-partisan organization, meaning it does not align with or support any political party. Its mission is to bring transparency and accountability to political processes, irrespective of party affiliations. The organization is dedicated to empowering voters by providing detailed information about candidates' backgrounds and advocating for reforms in the political and electoral systems.

**91. Solution: a)**

Statement 1 is incorrect: While Shivaji established a highly disciplined and well-trained army, he was not the first ruler to create a standing army. Earlier rulers like Alauddin Khilji had standing armies.

Statement 2 is correct: Shivaji's military strategies were based on Guerrilla Warfare (Ganimi Kawa), using swift movements, surprise attacks, and mountainous terrain to weaken stronger enemies like the Mughals.

Statement 3 is incorrect: Unlike the centralized Mughal administration, Shivaji's governance was decentralized, with a strong emphasis on local governance and efficient revenue collection.

**92. Solution: b)**

The North Equatorial Current influences the Andaman Sea, bringing warm waters from the Pacific Ocean,

which affects monsoons and marine biodiversity.

Agulhas Current (Southwest Indian Ocean), Benguela Current (South Atlantic), and Humboldt Current (South America) do not affect the Andaman Sea.

**93. Solution: c)**

The Naxalite movement, which began in 1967 in Naxalbari village, was primarily driven by the objective of redistributing land and resources to marginalized and oppressed communities, particularly the peasantry. The movement, inspired by Maoist ideology, sought to challenge the existing social and economic hierarchy, which favored landlords and powerful elites, by advocating for armed rebellion.

**94. Solution: a)**

Eturnagaram Wildlife Sanctuary, located in the state of Telangana, is predominantly a dry deciduous forest, which supports species like teak and bamboo. This makes Statement 2 correct.

However, Statement 1 is incorrect because tropical rainforests with evergreen species do not dominate the sanctuary; instead, it is characterized by dry deciduous forests with a mix of teak, bamboo, and other drought-resistant species.

Statement 3 is also incorrect because the sanctuary is an inland forest and is not influenced by mangrove ecosystems, which are generally found in coastal or tidal areas. Therefore, the sanctuary's flora reflects the dry deciduous nature rather than a rainforest or mangrove ecosystem, providing habitat for various wildlife, including tigers, leopards, and deer.

**95. Solution: b)**

Statement 1 is correct. The NAC will provide crop-specific standards for major crops like paddy, wheat, oilseeds, and pulses, ensuring standardized practices for different crops.

Statement 2 is incorrect. While the NAC includes standards for organic farming, it does not exclusively focus on it. It also covers other practices like natural farming and the use of chemical inputs where necessary.

Statement 3 is correct. The NAC emphasizes sustainability and modern techniques such as SMART farming, which includes the use of technology and traceability in agriculture. This highlights the forward-thinking nature of the NAC in promoting agricultural innovation.

**96. Solution: c)**

The GDC was introduced during the UN's 'Summit of the Future,' which focuses on harnessing digital technologies for the common good while promoting sustainable development. The compact is a non-binding diplomatic instrument, guiding digital technology use and governance globally. It aims to address significant challenges such as the digital divide, data privacy, and ethical AI use. This summit highlights the global commitment toward advancing responsible digital infrastructure while aligning with the broader UN objectives for sustainability and human rights.

**97. Solution: a)**

Statement 1 is correct as PM-MITRA (Mega Integrated Textile Region and Apparel Parks) focuses on creating world-class infrastructure for the textile and apparel sectors.

Statement 2 is also correct because the scheme aims to attract both domestic and foreign investments by establishing large integrated textile parks, boosting exports and fostering economic growth.

Statement 3 is incorrect because the scheme does not focus solely on traditional textile manufacturing. Instead, it aims at modernizing the industry, promoting cutting-edge technologies, and enhancing the global competitiveness of India's textile sector.

**98. Solution: d)**

Statement 1 is correct because slag, a byproduct of steel production, can undergo lithification, mimicking natural geological processes that turn it into sedimentary rock over time.

Statement 2 is also correct, as the lithification process can sequester carbon dioxide through mineral carbonation,

contributing to the reduction of greenhouse gases in the atmosphere.

Statement 3 is incorrect because the use of slag in artificial ground does not contribute to increased soil acidity or hinder plant growth. Instead, slag is often repurposed for environmental benefits, including carbon sequestration and reducing the carbon footprint of the steel industry.

**99. Solution: d)**

The Black Sea lies between Turkey and Russia, and is connected to the Mediterranean Sea through the Bosphorus Strait.

**100. Solution: b)**

Statement 1 is correct because LGDs are created in laboratories but through processes that replicate natural diamond formation.

Statement 2 is also correct, as the CVD method uses temperatures around 800°C to grow diamonds.

Statement 3 is incorrect because LGDs have the same chemical composition as natural diamonds (both are made of pure carbon).

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