

Solutions

DATE : 23rd Dec – 29th Dec

1) Answer: b) Only two

• **Explanation:**

- **Statement 1:** Correct. It is Bangladesh's first nuclear power plant.
- **Statement 2:** Correct. It is being constructed by **Rosatom**, Russia's state nuclear corporation.
- **Statement 3:** Incorrect. The plant is located along the **Padma River**, not the Jamuna River.

Key Facts:

- Location: Rooppur, Ishwardi Upazila, Pabna District.
- Features: Total capacity of 2.4 GWe, consisting of two VVER-1200 reactors, operational by 2025.

2) Answer: c) Overvaluation of the currency, making exports costlier

• **Explanation:**

- REER measures a country's currency value against a basket of currencies, adjusted for inflation.
- **Increase in REER** indicates the domestic currency has appreciated in real terms. This overvaluation makes exports more expensive, reducing trade competitiveness.
- Imports become cheaper, which can increase foreign goods' preference and worsen the trade balance.

Impact:

- Reduced export revenues.
- Increased import expenditure.

3) Answer: c) Facilitating movement for familial, cultural, and economic purposes

• **Explanation:**

- FMR allows residents within a specified radius on either side of the border to move freely without visas for familial, cultural, and economic purposes.
- Initially set at 40 km, the territorial limit was later reduced to 16 km and is now proposed at 10 km.

States Involved:

- Arunachal Pradesh, Nagaland, Manipur, and Mizoram.

4) Answer: d) None of the above

• **Explanation:**

- **Statement 1:** Incorrect. Malaviya presided over four INC sessions but not the Lahore Session in 1931.
- **Statement 2:** Incorrect. The slogan "Inquilab Zindabad" was coined by Bhagat Singh and not by Malaviya.
- **Statement 3:** Incorrect. Malaviya supported the **Non-Cooperation Movement**.

Key Contributions:

- Founder of Banaras Hindu University (BHU).
- Advocated for **Satyamev Jayate** as a national slogan.

5) Answer: a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

• **Explanation:**

- **Statement I:** A decrease in REER improves export competitiveness by undervaluing the currency.
- **Statement II:** A decrease in REER reflects currency undervaluation, making exports cheaper and imports costlier.
- Both statements are correct, and Statement-II explains Statement-I.

6) Answer: a) Only one

• **Explanation:**

- **Statement 1:** Incorrect. The scheme offers monthly pensions, not lump sum benefits.
- **Statement 2:** Correct. Survivors, retirees, and disabled employees are provided monthly pensions.
- **Statement 3:** Incorrect. The scheme is managed by **EPFO under the Ministry of Labour and Employment**, not the Ministry of Finance.

7) Answer: a) Only one

• **Explanation:**

- **Statement 1:** Correct. Malaviya advocated abolishing indentured labour.
- **Statement 2:** Incorrect. He supported free and compulsory education.
- **Statement 3:** Incorrect. He opposed taxing religious pilgrimages, promoting religious tolerance.

8) Answer: b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

• **Explanation:**

- **Statement I:** Correct. The Act covers both national-level (NEET, JEE) and state-level exams.
- **Statement II:** Correct. Authorities can penalize service providers for paper leaks and technical failures.
- However, Statement-II is not the explanation for Statement-I.

9) Answer: b) 1 and 3 only

• **Explanation:**

- **Statement 1:** Correct. UCC replaces religion-specific laws with a uniform civil framework.
- **Statement 2:** Incorrect. Article 44 is a **Directive Principle**, not a Fundamental Right.
- **Statement 3:** Correct. UCC fosters national integration and reduces religious disparities.

10) Answer: d) 1, 2, and 3 only

• **Explanation:**

- REER calculations involve **trade weights of trading partners, nominal bilateral exchange rates, and inflation differentials**.
- Capital flows impact currency value but do not directly influence REER.

11) Answer: d) High error rates due to decoherence

- **Explanation:**
 - Quantum computers are sensitive to **decoherence**, where qubits lose their quantum state due to environmental interference.
 - **Limitations:**
 - High costs of maintenance.
 - Scaling challenges due to instability of qubits.
 - Limited commercial applications, as quantum advantages are specific to areas like cryptography.

12) Answer: a) Only one

- **Explanation:**
 - **Statement 1:** Incorrect. It is listed under Appendix I of CITES, indicating higher protection due to its endangered status.
 - **Statement 2:** Correct. It is an arboreal species inhabiting the Western Ghats' rainforests.
 - **Statement 3:** Incorrect. Its population is threatened by **habitat loss and fragmentation**.

13) Answer: b) Panna Tiger Reserve

- **Explanation:**
 - **Ken-Betwa Link Project** will submerge a part of **Panna Tiger Reserve**, impacting tiger habitats.
 - It is India's first river interlinking project under the **National Perspective Plan**.

14) Answer: b) 2 and 3

- **Explanation:**
 - **Statement 1:** Incorrect. Mammoths had smaller ears to conserve heat, not large ones.
 - **Statement 2:** Correct. Woolly mammoths are genetically closer to Asian elephants.
 - **Statement 3:** Correct. Mammoths are classified as **Extinct** on the IUCN Red List.

15) Answer: c) 1 and 2

- **Explanation:**
 - **Statement 1:** Correct. It is part of the **Sagarmala Programme**, promoting port-led industrialization.
 - **Statement 2:** Correct. It contributes to industrial growth along the **Coromandel Coast**.
 - **Statement 3:** Incorrect. The port focuses on cargo handling, not passenger ferries.

16) Answer: c) Hawaiian-Emperor seamount chain

- **Explanation:**
 - Kilauea is an **active shield volcano** in Hawaii, formed by the Hawaiian hotspot.
 - It is part of the **Hawaiian-Emperor seamount chain**, characterized by its broad profile and fluid lava flows.

17) Answer: d) To ensure military and administrative accountability among nobles

- **Explanation:**
 - The **Mansabdari system** assigned ranks (mansabs) to officials, ensuring military efficiency and administrative accountability.
 - Land revenue systems like **Zabt** were separate mechanisms for agricultural revenue collection.

18) Answer: a) 1 and 2

- **Explanation:**
 - **Statement 1:** Correct. The **NAPCC** includes missions on renewable energy, water conservation, and energy efficiency.
 - **Statement 2:** Correct. The **FAME scheme** promotes the adoption of electric vehicles.
 - **Statement 3:** Incorrect. The **PAT scheme** focuses on energy efficiency, not hydrogen-based clean energy.

19) Answer: a) 1 and 2

- **Explanation:**
 - **Statement 1:** Correct. Qubits exploit **superposition**, allowing them to hold values of 0, 1, or both simultaneously.
 - **Statement 2:** Correct. Quantum gates perform logical operations similar to classical gates.
 - **Statement 3:** Incorrect. Quantum computers are currently **complementary**, not replacements for classical computers.

20) Answer: b) Only two

- **Explanation:**
 - **Statement 1:** Correct. Akbar's administration was structured into **Subhas, Sarkars, Paraganas**, and villages.
 - **Statement 2:** Correct. The **Diwan-i-Arz** was responsible for military affairs.
 - **Statement 3:** Incorrect. **Fatehpur Sikri** reflects a blend of Persian, Islamic, and Indian architectural styles, not Indo-Gothic.

21) Answer: d) All four

- **Explanation:**
 - **Statement 1:** Correct. Critical minerals like cobalt, lithium, and rare earth elements are vital for semiconductors, EVs, and renewable energy technologies.
 - **Statement 2:** Correct. The concentration of critical minerals' extraction in regions like China and the DRC leads to supply chain risks.
 - **Statement 3:** Correct. Transition to renewable energy and achieving Net Zero targets depend on critical minerals.
 - **Statement 4:** Correct. A lack of critical minerals disrupts the low-carbon economy by limiting technological advancements.

22) Answer: c) 3 only

- **Explanation:**
 - **Statement 1:** Incorrect. The NHRC is a **statutory body**, established under the Protection of Human Rights Act, 1993, not a constitutional body.
 - **Statement 2:** Incorrect. The NHRC reviews both **domestic laws** and **international treaties** for human rights compliance.
 - **Statement 3:** Correct. The Chairperson must be a **former Chief Justice of India** or a **Supreme Court judge** as per the PHRA.

23) Answer: a) Cold-blooded with W-shaped pupils for enhanced vision

- **Explanation:**
 - Cephalopods are **marine invertebrates** known for their intelligence and distinct features.
 - They are **cold-blooded** and have **W-shaped pupils**, providing excellent vision for camouflage and hunting.
 - Other features include chromatophores for color change and distributed neurons in their arms.

24) **Answer: c) Probabilistic forecasting with better prediction of extreme weather events**

- **Explanation:**
 - **GenCast** uses AI-driven probabilistic forecasting, offering better predictions for extreme weather like cyclones.
 - Unlike deterministic NWP models, GenCast uses ensemble forecasting and is resource-efficient with higher accuracy in long-term predictions.

25) **Answer: c) States have the discretion to hold back students in Classes 5 and 8 based on academic performance**

- **Explanation:**
 - The 2019 amendment reversed the **no-detention policy**, allowing states to detain students in **Classes 5 and 8** if they fail remedial assessments.
 - However, the policy remains in place for Classes 1-4 and 6-7.

26) **Answer: d) Demonstrate in-space docking of two spacecraft**

- **Explanation:**
 - **SpaDeX (Space Docking Experiment)** is an ISRO mission demonstrating docking and undocking of spacecraft in low Earth orbit.
 - It is crucial for developing space stations, robotic applications, and future exploration missions.

27) **Answer: c) Torrijos-Carter Treaty**

- **Explanation:**
 - The **Torrijos-Carter Treaty** (1977) between the U.S. and Panama enabled the transfer of the **Panama Canal** to Panama on December 31, 1999.
 - It established Panamanian sovereignty over the canal while ensuring its neutrality.

28) **Answer: b) China**

- **Explanation:**
 - **China** dominates the global supply of critical minerals like cobalt, germanium, and strontium, leveraging its strategic control over mining and processing industries.

29) **Answer: b) Production of isotopes for medicine, agriculture, and industry**

- **Explanation:**
 - The **Cirus reactor** contributed significantly to **isotope production** for use in medicine, agriculture, and industry.
 - It also supported R&D for India's nuclear and heavy water reactor technologies.

30) **Answer: b) 2 and 3**

- **Explanation:**
 - **Statement 1:** Incorrect. **KABIL** (Khanij Bidesh India Ltd.) secures overseas assets, not domestic reserves.
 - **Statement 2:** Correct. The **Geological Survey of India (GSI)** promotes domestic exploration of critical minerals.
 - **Statement 3:** Correct. India is part of the **Critical Raw Materials Club**, fostering global partnerships for mineral security.

31) **Answer: c) The quantum state alters, alerting the sender and receiver**

- **Explanation:**

Quantum Key Distribution (QKD) is based on the principles of quantum mechanics. Photons used to transmit the key exist in a superposition state. If an eavesdropper tries to measure these photons, the superposition collapses, altering the quantum state.

This change is detected by inconsistencies during the verification process, ensuring the security of the communication.

32) **Answer: b) Only two**

- **Explanation:**
 - **Statement 1:** Incorrect. The IJC operates under the UN Secretary-General and General Assembly, not the International Court of Justice (ICJ).
 - **Statement 2:** Correct. The IJC recommends candidates for UN Dispute Tribunal (UNDT) and UN Appeals Tribunal (UNAT).
 - **Statement 3:** Correct. The IJC monitors the independence and accountability of internal justice mechanisms.

33) **Answer: c) To provide high-speed internet access globally, especially in remote areas**

- **Explanation:**

Starlink, designed by SpaceX, uses a constellation of satellites in low Earth orbit to provide high-speed, low-latency internet access, particularly in underserved or remote areas. It ensures resilient connectivity even during disasters.

34) **Answer: a) Beam divergence leads to measuring multiple objects simultaneously**

- **Explanation:**

Speed guns using radio waves emit beams that diverge, which can reflect off multiple objects simultaneously. This leads to inaccurate speed measurements as the device cannot distinguish which reflection corresponds to the intended target.

35) **Answer: d) Relative motion between the source and the observer**

- **Explanation:**

The Doppler Effect occurs due to the relative motion between a wave source and the observer. This changes the perceived frequency: higher when the source approaches and lower when it moves away. It applies to sound, light, and electromagnetic waves.

36) **Answer: a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I**

- **Explanation:**
 - **Statement-I:** Correct. Bio-bitumen is derived from renewable sources like lignin and crop stubble.
 - **Statement-II:** Correct. Bio-bitumen reduces dependency on fossil fuels, lowering carbon emissions, aligning with sustainability goals.

37) **Answer: b) 2 only**

- **Explanation:**
 - **Statement 1:** Incorrect. The 1961 rules no longer mandate public access to all election records due to amendments limiting the scope.
 - **Statement 2:** Correct. Voter identity confidentiality is a key feature of these rules.

38) **Consider the following statements regarding quantum satellites:**

- **Answer: d) 1 and 3 only**
- **Explanation:**
 - **Statement 1:** Correct. Photons are used to encode and transmit information.
 - **Statement 2:** Incorrect. Quantum satellites operate beyond Earth's atmosphere for global communication.
 - **Statement 3:** Correct. Quantum entanglement ensures that tampering is instantly detected.

39) Answer: b) 1 and 3 only

- **Explanation:**
 - **Statement 1:** Correct. Quantum satellites are virtually immune to hacking.
 - **Statement 2:** Incorrect. Quantum satellites complement, rather than fully replace, classical cryptographic systems.
 - **Statement 3:** Correct. Their secure communication benefits defence, banking, and government sectors.

40) Answer: d) None

- **Explanation:**
 - **Statement 1:** Incorrect. Bio-bitumen can replace petroleum-based bitumen in road construction.
 - **Statement 2:** Incorrect. Bio-bitumen is suitable for industrial uses like waterproofing.
 - **Statement 3:** Incorrect. Bio-bitumen supports sustainability by reducing reliance on synthetic materials and utilizing agricultural residues.

41) Solution: a) 2 and 3 only

Explanation:

- **Statement 1:** Incorrect. The SMILE Program is funded by the Asian Development Bank (ADB), not the World Bank.
- **Statement 2:** Correct. The program promotes smart, efficient, and low-emission logistics systems.
- **Statement 3:** Correct. Implemented by the Department for Promotion of Industry and Internal Trade (DPIIT), under the Ministry of Commerce and Industry.

About SMILE Program:

- **Full Form:** Strengthening Multimodal and Integrated Logistics Ecosystem.
- **Aim:** To enhance logistics efficiency, expand manufacturing, and improve supply chain resilience.
- **Funding:** Policy-based loan program funded by the ADB.

42) Solution: c) Enhancing global data transmission at high speeds

Explanation:

- **Purpose:** Undersea fiber-optic cables are essential for transmitting high-speed data globally and form the backbone of the internet.
- **IAX:** Connects Chennai and Mumbai with Singapore, Thailand, and Malaysia.
- **IEX:** Links Chennai and Mumbai with Europe via France, Greece, and Saudi Arabia.

43) Solution: c) 2 only

Explanation:

- **Statement 1:** Incorrect. The report focuses on interdependencies among biodiversity, food, water, and health, not solely on economic implications.
- **Statement 2:** Correct. It emphasizes the interconnectedness of these systems and their role in tackling global challenges.
- **Statement 3:** Incorrect. The report provides actionable recommendations but does not propose a new international agreement.

About Nexus Report:

- Published by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES).

- Focus: Biodiversity, water, food, health, and climate change interdependencies.

44) Solution: a) Spot-billed Pelican

Explanation:

- **Key Species:** Spot-billed Pelican and Lesser Adjutant.
- **Location:** Assam (Dhemaji and Lakhimpur districts).
- **Significance:** Sanctuary recorded a 72% decline in bird species over 27 years due to anthropogenic pressures.

45) Solution: a) 1, 3, and 4 only

Explanation:

- **Statement 1:** Correct. The mountains are a biodiversity hotspot with endemic plant and animal species.
- **Statement 2:** Incorrect. Despite harsh winters, the region is popular for tourism.
- **Statement 3:** Correct. Known globally for winter sports.
- **Statement 4:** Correct. The mountains form a natural geopolitical boundary between Europe and Asia.

46) Solution: b) 2 only

Explanation:

- **Statement 1:** Incorrect. IPBES does not draft legally binding agreements.
- **Statement 2:** Correct. It bridges the gap between science and policy for biodiversity management.
- **Statement 3:** Incorrect. IPBES focuses on scientific assessments and recommendations, not direct funding.

47) Solution: d) None of the above

Explanation:

- **Key Points:** PAP is required only for foreign nationals, not Indian citizens. It is governed by the Ministry of Home Affairs (MHA), not state governments.

48) Solution: c) Ukraine

Explanation:

- **Georgia's Borders:** Russia (north), Turkey (southwest), Armenia (south), Azerbaijan (southeast), and the Black Sea (west). Ukraine does not share a border.

49) Solution: d) It decapitates honeybees to feed its larvae and destroys entire hives.

Explanation:

- **Threat:** Can decimate entire honeybee hives in under 90 minutes, posing severe risks to pollinator populations and ecosystems.

50) Solution: b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

Explanation:

- **Statement-I:** Correct. Kuwait is at the northern tip of the Arabian Peninsula.
- **Statement-II:** Correct. Kuwait Bay is a significant natural harbour but does not explain the country's geographical position.