

# Solutions

DATE : 30<sup>th</sup> Dec- 5<sup>th</sup> Jan

**1. Answer: a) Signal latency due to geostationary satellite positioning**

- **Key Challenge:** Geostationary satellites at 36,000 km cause **signal latency**, making real-time communication slower.
- **Secondary Issues:** Compatibility and data compression have less impact compared to latency.

**2. Answer: b) Only two**

- **Correct Statements:**
  1. Sree Narayana Guru promoted **inter-caste marriages** to reduce caste-based discrimination.
  2. Supported the **Vaikom Satyagraha** for temple entry rights.
- **Incorrect Statement:** Did not call for the **abolition of religious practices**, but reformation within them.

**3. Answer: b) Gaps in the dissemination of accurate and timely agricultural information**

- **Main Focus:** Project VISTAAR addresses **information dissemination gaps**.
- **Key Features:** Uses **digital platforms** for advisory services and connects farmers with innovations and schemes.

**4. Answer: c) Offline data collection capabilities in remote areas**

- **Key Feature:** ODK enables **data collection offline**, vital for remote locations without internet.
- **Secondary Features:** Real-time GPS and encryption are supportive but not defining.

**5. Answer: a) Only one**

- **Correct Statements:**
  1. Provides **seamless coverage** over oceans and remote areas.
  2. Suitable for **long-haul flights** compared to ATG systems.
- **Incorrect Statement:** Signals are routed via **onboard servers**, not directly to devices.

**6. Answer: b) Only two**

- **Correct Statements:**
  1. Injectable hydrogels release drugs in response to **specific environmental triggers** like pH.
  2. Improve **bioavailability** at tumor sites.
- **Incorrect Statement:** Drug release is **autonomous**, not requiring continuous external stimuli.

**7. Answer: a) Only one**

- **Correct Statements:**
  1. Provides access to **government schemes**.
  2. Promotes **sustainable farming practices**.
- **Incorrect Statement:** Not exclusively implemented by the Ministry of Agriculture; involves **IIT Madras**.

**8. Answer: c) Transition from the Wholesale Price Index (WPI) to the Producer Price Index (PPI)**

- **Primary Objective:** Ramesh Chand Committee evaluates **WPI revision** and explores transition to **PPI**.
- **Significance:** Aligns with **international standards** and improves inflation tracking.

**9. Answer: d) Measures changes in consumer purchasing power**

- **Key Point:** PPI tracks **producer-level price changes**, not **consumer purchasing power** (covered by CPI).
- **Scope:** Includes **services sector** and aligns with **System of National Accounts (SNA)**.

**10. Answer: d) Transfer full control of the Panama Canal to Panama by a specified date**

- **Objective:** Torrijos-Carter Treaties transferred canal control to **Panama** by December 31, 1999.
- **Neutrality:** Declared canal a **neutral waterway** while ensuring U.S. defense rights.

**11. Answer: c) 1 and 3 only**

- **Explanation:**
  - **Correct Statements:**
    1. PMFBY provides coverage for yield losses caused by natural calamities like floods, droughts, and cyclones.
    2. Satellite technology is used for yield estimation, along with drones, remote sensing, and AI.
  - **Incorrect Statement:** Farmers pay only **5%** of the premium for horticultural crops, not 10%. The rest is subsidized by the government.

**12. Answer: a) 1 and 2 only**

- **Explanation:**
  - **Correct Statements:**
    1. Incineration involves controlled combustion of waste at high temperatures (over 850°C).
    2. Energy is recovered in the form of heat or electricity through steam-powered turbines.
  - **Incorrect Statement:** Incineration is less effective for **wet waste** as its low calorific value hampers efficient energy recovery.

**13. Answer: d) Development of hypersonic capabilities and AI integration**

- **Explanation:**
  - **Key Features of 6th Generation Jets:**
    - Hypersonic speeds and **AI integration** for advanced decision-making.
    - Directed-energy weapons and optionally manned systems.
  - **Incorrect Options:**
    - Stealth design was introduced in 5th generation jets.
    - Multi-role capabilities and afterburners were features of earlier generations (3rd and 2nd, respectively).

**14. Answer: d) Streamlining defense procurement processes**

- **Explanation:**
  - The "Year of Reforms" focuses on transforming India's **defense sector**, emphasizing:
    - Streamlined procurement for faster acquisitions.
    - Modernization of armed forces and integration of emerging technologies like AI and hypersonic systems.
  - **Incorrect Options:** Agriculture and judiciary are unrelated to this initiative.

15. Answer: c) 1 and 3 only

- **Explanation:**
  - **Correct Statements:**
    1. IMD provides short-term and long-term **weather forecasts** for agriculture, aviation, and disaster management.
    2. IMD conducts research on **monsoon dynamics** and **climate change** impacts.
  - **Incorrect Statement:** IMD operates under the **Ministry of Earth Sciences**, not the Ministry of Environment.

16. Answer: b) 1 and 3 only

- **Explanation:**
  - **Correct Statements:**
    1. Regional centers of IMD provide **localized weather forecasts**.
    2. They offer sector-specific services for **agriculture and aviation**.
  - **Incorrect Statement:** Regional centers are not independent but work in **coordination** with central IMD headquarters.

17. Answer: b) Wet organic waste

- **Explanation:**
  - **Reason:** Wet organic waste has low calorific value, making it inefficient for energy recovery during incineration.
  - **Better Suited Waste:** High-calorific plastics, hazardous biomedical waste, and dry materials like paper and cardboard.

18. Answer: b) 1 and 3 only

- **Explanation:**
  - **Correct Statements:**
    1. Incineration reduces waste volume by approximately **90%**, significantly saving landfill space.
    2. Recovers energy in the form of heat or electricity.
  - **Incorrect Statement:** It does not completely eliminate the need for landfills, as residual ash and waste require proper disposal.

19. Answer: a) 1 and 2 only

- **Explanation:**
  - **Correct Statements:**
    1. Crop rotation and cover cropping improve soil health, reducing **nitrate leaching** into groundwater.
    2. Reverse osmosis effectively removes **nitrates** from drinking water.
  - **Incorrect Statement:** Constructed wetlands reduce nitrate levels through **natural filtration**, not increase them.

20. Answer: d) 1, 2, and 3

- **Explanation:**
  - **All Correct Statements:**
    1. The Saraswati River is mentioned in both the **Rigveda** and **Mahabharata**.
    2. It is believed to originate near **Kailash Mansarovar** in the Himalayas.
    3. It flows through present-day **Gujarat, Haryana, and Rajasthan**, based on paleo-hydrological studies.

21. Answer: b) Only two

- **Explanation:**
  - **Correct Statements:**
    2. A Private Member's Bill, if rejected, does not impact the government's stability as it is non-binding.

3. Discussions on such Bills are scheduled on Fridays, limiting their debate time.

- **Incorrect Statement:**
  1. Both ruling and opposition MPs can introduce a Private Member's Bill.

22. Answer: b) Only two

- **Explanation:**
  - **Correct Statements:**
    1. Exercise Surya Kiran is a bilateral exercise between **India and Nepal**.
    2. It includes training in **jungle warfare and disaster management**.
  - **Incorrect Statement:**
    2. It does not focus on maritime security or counter-piracy but on **counter-terrorism and jungle warfare**.

23. Answer: c) Landing gear malfunction or emergency conditions

- **Explanation:**
  - A belly landing is performed when **landing gear fails to deploy** or if using it could worsen the situation.
  - It is a controlled emergency maneuver to minimize risks like structural damage or fire.

24. Answer: c) Improving quantum error correction and scalability

- **Explanation:**
  - Google's Willow processor focuses on **quantum error correction** to address qubit errors caused by environmental disturbances.
  - It employs advanced techniques like **surface codes** for error detection and scalability improvement.

25. Answer: d) It is an island nation in the Caribbean, located in the Atlantic Ocean

- **Explanation:**
  - **Location:** Trinidad and Tobago is the southernmost Caribbean nation in the Atlantic Ocean, 11 km from Venezuela.
  - **Incorrect Options:** It is not in the Pacific Ocean, landlocked, or between the Indian Ocean and Arabian Sea.

26. Answer: c) To prevent cascading collisions in orbit by limiting debris generation

- **Explanation:**
  - NASA's Kessler Syndrome Mitigation aims to avoid cascading collisions (where debris creates more debris) by promoting **debris limitation strategies** and space traffic management.

27. Answer: b) Only two

- **Explanation:**
  - **Correct Statements:**
    2. AIP systems carry **liquid oxygen** for underwater operations.
    3. AIP reduces detection vulnerability by allowing submarines to stay submerged longer.
  - **Incorrect Statements:**
    1. AIP is used in **diesel-electric submarines**, not nuclear ones.
    2. AIP systems are **more compact** compared to conventional diesel-electric setups.

28. Answer: a) 1 and 2

- **Explanation:**
  - **Correct Statements:**
    1. A **one-month notice** is mandatory before introducing a Private Member's Bill.

2. Such Bills can be referred to **parliamentary committees** for detailed examination.

- **Incorrect** **Statement:**  
3. Presidential approval is not required before introduction, only after Parliament passes the Bill.

29. Answer: a) 1 and 2

- **Explanation:**
  - **Correct Statements:**
    1. Superconducting qubits operate at **near absolute zero temperatures** for stability.
    2. They enhance **coherence time**, enabling longer quantum computations.
  - **Incorrect** **Statement:**  
3. Willow does not use photonic states but **superconducting qubits**.

30. Answer: c) Level alignment with wings parallel to the ground

- **Explanation:**
  - During a belly landing, **level alignment** ensures that the aircraft's wings remain parallel to the ground, preventing flipping.
  - Controlled descent and flap management also reduce impact forces and maintain stability.

31. Answer: d) None

- **Explanation:**
  - **Incorrect Statements:**
    1. Norovirus spreads through **contaminated food, water, surfaces, and close contact**, not through animal vectors.
    2. High-risk locations include **crowded environments** like schools, cruise ships, and restaurants, not isolated rural areas.
    3. Norovirus infections occur **globally in various climates**, though outbreaks are more frequent during winter.

32. Answer: a) It acts as an indicator species for wetland health.

- **Explanation:**
  - The Fishing Cat is an **indicator species**, reflecting the ecological health of wetlands.
  - Its presence ensures the balance of aquatic ecosystems, as it preys on fish, frogs, and other small species.

33. Answer: d) Asserting U.S. willingness to use military force to defend its interests in the Persian Gulf

- **Explanation:**
  - The Carter Doctrine, announced in 1980, declared the U.S. commitment to use **military force to protect its interests in the Persian Gulf**, particularly safeguarding oil supplies and deterring Soviet expansion.

34. Answer: a) Only one

- **Explanation:**
  - **Correct** **Statement:**  
2. Employers must prove a lack of qualified U.S. workers to hire H-1B visa holders.
  - **Incorrect Statements:**
    1. The H-1B visa applies to various sectors, including IT, engineering, healthcare, and research.
    2. H-1B visa holders cannot work for multiple employers unless each files a separate petition.

35. Answer: b) Only two

- **Explanation:**
  - **Correct Statements:**

1. Vembanad Lake is the **largest backwater ecosystem in India**.

- **Incorrect** **Statement:**  
2. The **Nehru Trophy Boat Race** is held annually on its waters.  
3. The lake is separated from the Arabian Sea by a **barrier island**, not the Western Ghats.

36. Answer: d) Enables submarines to operate underwater without surfacing for extended durations

- **Explanation:**
  - Air Independent Propulsion (AIP) systems allow **conventional submarines** to remain submerged longer by generating electricity underwater without relying on atmospheric oxygen.

37. Answer: d) To position India as a global leader in the media and entertainment industry

- **Explanation:**
  - The **World Audio Visual Entertainment Summit (WAVES)** aims to promote India as a **global hub for media and entertainment (M&E)** by fostering innovation, investment, and skill development.

38. Answer: b) Only two

- **Explanation:**
  - **Correct Statements:**
    1. The Parker Solar Probe is part of NASA's **Living with a Star program**.
    2. The data helps advance **space weather forecasting**.
  - **Incorrect** **Statement:**  
2. The probe studies the **Sun's corona and magnetic fields**, not Earth's atmosphere.

39. Answer: d) Statement-I is incorrect but Statement-II is correct

- **Explanation:**
  - **Incorrect Statement-I:** Scorpene class submarines are **diesel-electric**, not nuclear-powered.
  - **Correct Statement-II:** These submarines are designed to accommodate **Air Independent Propulsion (AIP)** systems as upgrades.

40. Answer: b) Andhra Pradesh; supports a thriving mangrove ecosystem

- **Explanation:**
  - Coringa Wildlife Sanctuary in Andhra Pradesh is known for its **dense mangrove forests**, which support species like the Fishing Cat and Olive Ridley turtles.

41. Answer: c) Demonstration of rendezvous, docking, and undocking of two spacecraft

- **Explanation:**
  - The **SpaDeX Mission** demonstrates critical technologies like spacecraft rendezvous, docking, and undocking, essential for robotic and inter-satellite applications.
  - Secondary objectives include **power transfer** between docked spacecraft and payload operations.

42. Answer: d) 1 and 3

- **Explanation:**
  - **Correct Statements:**
    1. The initiative safeguards cultural expressions endangered by **globalization**.
    2. Inclusion requires alignment with **sustainable development principles**.



- **Incorrect** **Statement:**  
2. Community participation, not just government support, is crucial for inclusion in the inventory.

43. Answer: c) 1, 3, and 4

- **Explanation:**
  - **Correct Statements:**
    1. The project aims to **generate hydropower** (11,000 MW) and mitigate floods.
    2. It is a collaboration between **NHPC and NEEPCO**.
    3. Its reservoir maintains **river flow** during lean seasons.
  - **Incorrect** **Statement:**  
2. The project is located on the **Siang River** in Arunachal Pradesh, not the Dibang River in Assam.

44. Answer: d) Brahmi script

- **Explanation:**
  - The Sanskrit inscription found in **Gilgit** (Pakistan-Occupied Kashmir) dates to the 4th century CE and is written in **Brahmi script**.

45. Answer: b) 2 only

- **Explanation:**
  - **Correct** **Statement:**  
2. The agreement provides **preferential market access** for goods like textiles, chemicals, and agriculture products.
  - **Incorrect Statement:**
    1. The agreement includes trade in **new areas** like turbojets and gold-studded diamonds.

46. Answer: a) Only one

- **Explanation:**
  - **Correct** **Statement:**  
2. Advanced MASLD can progress to **hepatocellular carcinoma**.
  - **Incorrect Statements:**
    1. MASLD is caused by multiple factors like obesity, insulin resistance, and dyslipidemia, not exclusively by high cholesterol.
    2. MASLD is associated with increased risks of **cardiovascular diseases**.

47. Answer: d) Kerch Strait

- **Explanation:**
  - The **Kerch Strait** connects the Crimea Peninsula to mainland Russia and is spanned by the **Crimean Bridge**.

48. Answer: b) Only two

- **Explanation:**
  - **Correct** **Statements:**
    2. India supports **e-governance projects** in neighboring countries to enhance trade facilitation.
    3. The **Kaladan Multimodal Project** includes both waterways and roadways, linking India's northeast with Myanmar.
  - **Incorrect Statement:**
    1. The BBIN energy grid involves **Bangladesh, Bhutan, India, and Nepal**, not Myanmar.

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

- **Explanation:**
  - **Statement-I:** RECs allow industries to meet **renewable energy obligations** without directly sourcing renewable power.

- **Statement-II:** RECs were introduced to promote **renewable energy deployment** and ensure compliance flexibility, explaining the purpose behind Statement-I.

50. Answer: a) Only one

- **Explanation:**
  - **Correct Statement:**
    1. India is a current member of the **UNESCO Intangible Cultural Heritage (ICH) Committee** (2022–2026).
  - **Incorrect** **Statements:**
    2. The **Sangeet Natak Akademi**, not the Ministry of External Affairs, prepares nomination dossiers.
    3. The **Sangeet Natak Akademi**, not ASI, is the nodal office for ICH matters.

