

# Solutions

DATE : 21<sup>st</sup> April – 27<sup>th</sup> April

1) Answer: c) Statement-I is correct but Statement-II is incorrect

Detailed Explanation:

◆ Finance Commission and Fiscal Decentralization (Statement-I - Correct):

- The **Finance Commission** is constituted under **Article 280** of the Constitution every **five years**.
- It recommends:
  - **Vertical Devolution**: Division of tax revenues between the Centre and States.
  - **Horizontal Devolution**: Distribution among States based on parameters like **population, income distance, forest cover**, etc.
- This ensures **fiscal decentralization**, empowering States to design policies based on local needs.
- **Scholar Perspective**: According to **K.C. Wheare**, federalism requires **financial autonomy** for sub-national units.

◆ Borrowing Powers and Article 293 (Statement-II - Incorrect):

- **Article 293** regulates State borrowing: States need **Central Government's consent** to borrow if they have outstanding loans from the Centre.
- The **Finance Commission** has **no authority** over regulating State borrowing.
- **Only the Union Executive** can impose conditions regarding State borrowings.

◆ Contemporary Example:

- **15th Finance Commission** recommended fiscal discipline norms but did **not modify borrowing limits**; it suggested grants for disaster management, health sector support, etc.

2) Answer: c) Statement-I is correct but Statement-II is incorrect

Detailed Explanation:

◆ Purpose and Role of ESZs (Statement-I - Correct):

- Defined under **Environment Protection Act, 1986**.
- Serve as **buffer zones** around **Protected Areas** like National Parks, Wildlife Sanctuaries.
- Aim to **minimize negative externalities** of human activities like construction, mining, tourism.
- **MoEFCC Guidelines (2011)**: Promote regulated eco-development instead of banning all activities.

◆ Not Eco-Industrial Corridors (Statement-II - Incorrect):

- **Industrial activities** like mining, thermal plants, stone quarrying are **banned or heavily restricted** in ESZs.
- The idea is **environmental protection**, not **industrial promotion**.

◆ Example: Around the **Western Ghats**, ESZ notifications restrict development projects to protect biodiversity hotspots.

3) Answer: b) RFID-based signalling communication between train and trackside systems

Detailed Explanation:

◆ About Kavach System:

- **Indigenous Automatic Train Protection (ATP)** system developed by **Indian Railways**.
- Primary goal: **Prevent train collisions**, ensure **speed regulation**, and **adherence to signals**.

◆ Working Principle:

- Uses **Radio Frequency Identification (RFID)** tags installed along the railway tracks.
- Communication between:
  - **Locomotive-based equipment**
  - **Trackside equipment**
- **Ultra-High Frequency (UHF)** channels used for transmitting critical signals instantly.

◆ Key Features:

- **Automatic application of brakes** when a train passes a signal at danger.
- **Continuous updates** of track conditions to loco-pilots.

◆ Contemporary Example:

- Trial runs conducted successfully on the **South Central Railway Zone**.
- Vision: Deploy Kavach across **Delhi-Mumbai** and **Delhi-Howrah** corridors.

4) Answer: b) Only two

Detailed Explanation:

◆ Correct Statements (2 and 3):

- **Statement 2 (Correct)**: X-band radar, due to its **short wavelength** (2–4 cm), detects **rainfall intensity**, **cloud formation**, and **storm structures**.
- **Statement 3 (Correct)**: Works on **Rayleigh scattering**, where particle size (like raindrops) is **much smaller** than radar wavelength.

◆ Incorrect Statement (1):

- **X-band radars** have a **limited range** due to **high attenuation** in the atmosphere.
- **S-band or L-band radars** are preferred for **long-distance maritime surveillance**.

◆ Example: **Wayanad district**, Kerala, installed X-band radars to monitor **landslides** and **intense rainfall** events.

### 5) Answer: a) Only one

#### Detailed Explanation:

##### ◆ Correct Statement:

- ◆ **PLI Scheme Alignment:**
  - Critical minerals like **lithium, cobalt, nickel** are essential for **EVs, batteries, semiconductors**.
  - MSFN membership helps India **secure supply chains** to support domestic manufacturing under the **PLI schemes**.

##### ◆ Incorrect Statements:

- ◆ **Statement 1:** India is a **net importer** of minerals like lithium and cobalt; major imports come from **Australia, Argentina**, etc.
- ◆ **Statement 2:** MSFN primarily **finances projects**; it does **not transfer rare earth processing technology**, which remains a sensitive strategic domain.

◆ **Current Affairs Context:** India signed critical mineral agreements with **Australia and Argentina** in 2024.

### 6) Answer: d) None

#### Detailed Explanation:

##### ◆ Establishment:

- ◆ **Rome Statute** adopted in 1998; entered into force in 2002.
- ◆ ICC is **independent** of the United Nations system.

##### ◆ Jurisdiction Limits:

- ◆ ICC can act if:
  - **Crime occurred** in a member country.
  - **Accused is a citizen** of a member country.
  - **UNSC referral** under Chapter VII powers.

##### ◆ Trial of Individuals:

- ◆ ICC can **prosecute sitting Heads of State**.
- ◆ **Example:** Omar al-Bashir (Sudan), Uhuru Kenyatta (Kenya).

### 7) Answer: a) Regional stability amidst Cold War-era ideological tensions

#### Detailed Explanation:

##### ◆ Background:

- ◆ Formed during the **Cold War** when Southeast Asia faced **communist insurgencies**.
- ◆ Founding members: **Indonesia, Malaysia, Philippines, Singapore, Thailand**.

◆ **Purpose:** Foster **economic cooperation, political stability, peaceful co-existence**.

◆ **Not about Military Alliances:** ASEAN Charter emphasizes **non-interference, peaceful settlement of disputes**.

◆ **Contemporary Importance:** Plays a crucial role in **Indo-Pacific geopolitics** today.

### 8) Answer: c) Strategic dialogue on regional security and diplomacy in West Asia

#### Detailed Explanation:

◆ **Organizers:** Conducted annually by **IISS in Bahrain**.

##### ◆ Focus Areas:

- ◆ Regional security dynamics like:
  - **Iran-Saudi Arabia tensions**.
  - **Palestine-Israel conflict**.
  - **Energy security, maritime security**.

◆ **Nature of the Dialogue:** **Informal diplomatic platform**, no legally binding outcomes.

◆ **Example:** 2024 Dialogue emphasized **regional leadership and integration**.

### 9) Answer: b) Only two

#### Detailed Explanation:

##### ◆ Correct Statements (1 and 3):

- ◆ **Largest Trade Bloc:** Covers **55 African Union members**.
- ◆ **Tariff Elimination:** Aim to **eliminate tariffs on 90%** of intra-African goods.

◆ **Incorrect Statement (2):** AfCFTA does **not impose a single customs union** yet; customs authorities remain **national**, with efforts for harmonization ongoing.

◆ **Contemporary Development:** As of 2024, **Nigeria** ratified the AfCFTA after initial hesitation.

### 10) Answer: d) None

#### Detailed Explanation:

◆ **Geographical Location:** Located within the **Brahmaputra River** in Assam, not in Ganga-Brahmaputra Delta.

◆ **Formation Process:** Formed by **deposition and riverine erosion, not volcanic activity**.

◆ **UNESCO Status:** Proposed for **World Heritage Site**, but **not yet inscribed** officially.

◆ **Current Issue:** Facing **severe river erosion**, losing landmass every year.

### 11) Answer: c) Only three

#### Detailed Explanation:

##### ◆ Correctly Associated Sites:

- ◆ **Ajanta Caves:**
  - Located in Maharashtra.
  - Famous for **Buddhist paintings, sculptures, and architecture**.
  - Reflects **Hinayana and Mahayana traditions**.
- ◆ **Mahabodhi Temple Complex:**
  - Located at Bodh Gaya, Bihar.
  - Site of **Buddha's enlightenment** under the Bodhi tree.
- ◆ **Nalanda Mahavihara:**
  - Ancient **Buddhist monastic university** in Bihar.
  - Important center of **Buddhist learning and scholasticism** (5th–12th century CE).

##### ◆ Incorrect Association:

- ◆ **Pattadakal Group of Monuments:**
  - Located in Karnataka.
  - Dedicated to **Hindu deities**, mainly **Lord Shiva**.
  - Represents **early Chalukyan architecture** (blend of Nagara and Dravida styles).

- No direct Buddhist connection.

12) Answer: b) Only two

Detailed Explanation:

◆ Correct Statements:

- **Statement 1 (Correct):** Part of the **Central Asian Flyway**, crucial for migratory bird species.
- **Statement 2 (Correct):** **Flamingos** and other birds use it as a **feeding and resting site**.

◆ Incorrect Statement:

- **Statement 3 (Incorrect):** DPS Wetland is a **natural tidal wetland**, not an **artificial excavation**.

◆ Location and Importance:

- Situated at **Seawoods, Navi Mumbai**.
- Adjacent to **Thane Creek Ramsar site**.
- Plays a vital role in **biodiversity conservation** and **climate resilience**.

13) Answer: a) Only one

Detailed Explanation:

◆ Correct Statement:

- **Statement 2 (Correct):**
  - **Greater Flamingo (Phoenicopterus roseus)** is the **largest flamingo species**.
  - Native to **India's wetlands and saline lakes**.

◆ Incorrect Statements:

- **Statement 1 (Incorrect):** Flamingos are found in **coastal wetlands, mudflats, saline lakes** — not **evergreen forests** of the Western Ghats.
- **Statement 3 (Incorrect):** Build **mud mound nests**, not **floating nests**.

◆ Key Sites for Flamingos: **Sambhar Lake, Rann of Kutch, Thane Creek**.

14) Answer: c) All three

Detailed Explanation:

◆ Correct Statements:

- **PVTG Status:** Recognized as **Particularly Vulnerable Tribal Group (PVTG)** in Odisha.
- **Shifting Cultivation:** Practice **Podu cultivation** — clearing and rotating fields.
- **Mango Harvest Dance:** Performed as **thanksgiving to ancestral spirits** for nature's bounty.

◆ Cultural Significance:

- Reflects deep **eco-cultural ties**.
- Part of **India's indigenous knowledge systems**.

15) Answer: b) Only two

Detailed Explanation:

◆ Correct Statements:

- **Statement 1 (Correct):**

- Authored by **Bharat Muni**.
- Outlines **Rasa theory** and **principles of dramaturgy and stagecraft**.

- **Statement 3 (Correct):** Discusses **theatre architecture, dance (mudras), music scales, and performance arts**.

◆ Incorrect Statement:

- **Statement 2 (Incorrect):**
  - It is **not a medieval codification of temple rituals**.
  - Belongs to **ancient Sanskrit tradition** (estimated around 200 BCE–200 CE).

◆ UNESCO Recognition: **Natyashastra** and **Bhagavad Gita** added to **UNESCO Memory of the World Register (2024)**.

16) Answer: c) Statement-I is correct but Statement-II is incorrect

Detailed Explanation:

◆ Correct Statement:

- **Statement 1 (Correct):** Majuli's candidature under **mixed heritage** category highlights **India's cultural and ecological diplomacy**.

◆ Incorrect Statement:

- **Statement 2 (Incorrect):** Majuli is a **natural riverine island**, not a **post-industrial restoration site**.

◆ Additional Facts:

- Majuli was once the **largest river island** globally.
- Facing **erosion threats**, yet remains a **hub of Vaishnavite culture and biodiversity**.

17) Answer: a) 1 only

Detailed Explanation:

◆ Correct Statement:

- **Western Ghats:** Inscribed for their **exceptional biodiversity, endemism, and ecosystem diversity**.

◆ Incorrect Statement:

- **Rani-ki-Vav:**
  - Inscribed **only under cultural criteria**.
  - Renowned for **intricately carved stepwell architecture** in Gujarat.

◆ India's Current Heritage Sites Count: **43 World Heritage Sites** as of 2024.

18) Answer: d) Detection of Dimethyl Sulfide and Dimethyl Disulfide in its atmosphere

Detailed Explanation:

◆ Key Observations:

- **James Webb Space Telescope (JWST)** detected **Dimethyl Sulfide (DMS)** and **Dimethyl Disulfide (DMDS)**.
- These gases on Earth are **biosignatures** produced mainly by **marine microorganisms**.

◆ Significance:

- Strongest evidence of **potential microbial life** outside Earth.



- Marks a major advancement in **astrobiology**.

◆ **Note:** Scientists stress that **further confirmations** are required before conclusively claiming extraterrestrial life.

19) **Answer: d) It supports betel leaf cultivation in the districts it flows through**

**Detailed Explanation:**

◆ **Location:** Flows through Azamgarh, Mau, Ghazipur districts of Eastern Uttar Pradesh.

◆ **Key Feature:** Region is famous for **betel (pan) leaf cultivation**, crucial for **local economy**.

◆ **Agricultural Importance:** Microclimate along the Magai River promotes **high-quality betel farming**.

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

**Detailed Explanation:**

◆ **Correct Statements:**

- **Statement 1 (Correct):** JWST's placement at L2 point helps detect faint infrared signals.
- **Statement 2 (Correct and Explanation for I):** L2 location ensures:
  - Constant cold and dark environment.
  - Reduced thermal noise and background light interference.

◆ **Technical Features of JWST:**

- **Infrared observation** allows peering through cosmic dust clouds.
- **Gold-coated mirrors** enhance infrared reflectivity.

◆ **Mission Purpose:** Study early universe formation, galaxy evolution, and exoplanet atmospheres.

21) **Answer: a) Only one**

**Detailed Explanation:**

◆ **Correct Statement:**

- **Statement 3 (Correct):** NCMM explicitly promotes **mineral recycling** to reduce environmental degradation and import dependence.

◆ **Incorrect Statements:**

- **Statement 1:** Nuclear fuel development is under the **Department of Atomic Energy**, not NCMM.
- **Statement 2:** NCMM was launched by the **Ministry of Mines** in the **Union Budget 2024-25**, not by NITI Aayog or under the **Integrated Energy Policy**.

◆ **Key Points about NCMM:**

- Aims at **critical mineral security** for **clean energy** and **defense sectors**.
- Focus on minerals like **lithium, cobalt, rare earths**.

22) **Answer: c) It is the only sea connected directly to both the Mediterranean Sea and the Arabian Sea**

**Detailed Explanation:**

◆ **Correct Features:**

- Connects to **Mediterranean Sea** via **Suez Canal**.
- Connects to **Arabian Sea** via **Gulf of Aden**.

◆ **Incorrect Options Explained:**

- **Not formed at a triple junction** — it is due to **tectonic divergence**.
- **Salinity is high**, not low (up to **41 PSU**).
- **Supports deep coral ecosystems** resilient to **bleaching**.

◆ **Strategic Importance:** Facilitates **12% of global trade**.

23) **Answer: a) First exchange to launch a global depository receipt (GDR) in India**

**Detailed Explanation:**

◆ **Correct Milestones of BSE:**

- **Sensex** (India's first index) launched in **1986**.
- **Electronic trading (BOLT)** started in **1995**.
- Joined **UN Sustainable Stock Exchanges Initiative** in **2012**.

◆ **Incorrect Milestone:** GDRs are issued **overseas** by companies; no Indian exchange **launches** GDRs.

◆ **Key Fact:** BSE is Asia's oldest stock exchange (established in **1875**).

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

**Detailed Explanation:**

◆ **Habitat & Behavior:**

- Lives at **depths up to 2000 meters**.
- Rarely observed due to **logistical and technological challenges**.

◆ **Scientific Details:**

- **Mesonychoteuthis hamiltoni**.
- Possesses the **largest eyes** among known species.

◆ **Research Challenges:** Deep-sea conditions make **specimen retrieval** difficult.

25) **Answer: c) Only three**

**Detailed Explanation:**

◆ **Correct Statements:**

- **Celebrity advocacy:** Campaigns with stars like **Joaquin Phoenix**.
- **Global undercover investigations:** Exposing **animal cruelty**.
- **Ethical Motto:** Animals **should not be used** for any human purpose.

◆ **Incorrect Statement:** PETA rejects **cage-free meat**; advocates for **complete veganism**.

◆ **Organizational Fact:** Founded in **1980**, HQ in **Virginia, USA**, Indian office in **Mumbai**.

26) **Answer: b) Only two**

**Detailed Explanation:**

◆ **Incorrect Statements:**

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- **Statement 1:** Red Sea named after **red algal blooms** (*Trichodesmium erythraeum*), **not iron sediments**.
- **Statement 2:** Red Sea has **higher salinity** than the Indian Ocean.

◆ **Correct Statement:** **Statement 3:** Red Sea's **Bab el-Mandeb Strait** is crucial for **military surveillance** and **submarine operations**.

27) Answer: d) None

**Detailed Explanation:**

◆ **Incorrect Statements:**

- **PETA** is an **NGO**, not a **UN-affiliated body**.
- Focuses on **animal rights**, **not wildlife conservation**.
- **No Nobel Prize** awarded to PETA.
- Campaigns go **beyond vegetarianism**, covering **fashion, entertainment, cosmetics testing**, etc.

28) Answer: c) Enhancing amphibious interoperability with a Quad member for Humanitarian Assistance and Disaster Relief (HADR) operations

**Detailed Explanation:**

◆ **Focus Areas:**

- Conducts **amphibious landing operations**.
- Enhances **joint response capacity** during **natural disasters**.

◆ **Strategic Angle:** Collaboration with the **USA**, a **Quad partner**, to strengthen **maritime security** in the **Indo-Pacific**.

29) Answer: d) None

**Detailed Explanation:**

◆ **Incorrect Statements:**

- **Salary of CAG:** Decided by **Parliament separately**, not by the Finance Commission.
- **Executive vs Constitutional Body:** Finance Commission is a **constitutional body** under **Article 280**.
- **Election Commission Funding:** Drawn **directly from Consolidated Fund of India**, independent of FC recommendations.

30) Answer: b) Only two

**Detailed Explanation:**

◆ **Correct Statements:**

- Focuses on **counter-terrorism, urban warfare**, and **sub-conventional operations**.
- Aims to **enhance defense cooperation** with **Uzbekistan** (a **Central Asian Republic**).

◆ **Incorrect Statement:** It is a **bilateral exercise**, **not under SCO framework**, even though both nations are **SCO members**.

◆ **Contextual Note:** Part of India's "**Connect Central Asia**" policy.

31) Answer: d) None

**Detailed Explanation:**

◆ **Incorrect Statements:**

- **Statement 1:** The **Shyok River** flows through **India (Ladakh)** and then enters **Pakistan-administered Gilgit-Baltistan**.

- **Statement 2:** It originates from the **Rimo Glacier** (Karakoram Range), **not Pangong Tso**.
- **Statement 3:** It joins the **Indus River** near **Skardu** (Pakistan), **not the Ganga River**.

◆ **Key Fact:** It forms an important part of the **Indus River system**.

32) Answer: a) Only one

**Detailed Explanation:**

◆ **Correct Statement:**

- **Statement 3:** FC recommends **devolution of funds to Panchayati Raj Institutions (PRIs)** and **Urban Local Bodies (ULBs)**, especially after the **73rd and 74th Amendments**.

◆ **Incorrect Statements:**

- **Statement 1:** Borrowing limits are regulated by **Union Government** under **Article 293**, not FC.
- **Statement 2:** FC has **no mandate** to evaluate the **RBI's performance**.

33) Answer: b) Only two

**Detailed Explanation:**

◆ **Correct Statements:**

- **Statement 1:** **IOM** acts as **technical secretariat** for the **Colombo Process**.
- **Statement 3:** The process promotes **bilateral labour agreements** through **thematic working groups**.

◆ **Incorrect Statement:** **Statement 2:** Only **labour-sending countries** (not receiving countries) are members.

◆ **Key Members:** India, Bangladesh, Nepal, Pakistan, Sri Lanka, etc.

34) Answer: b) Only two

**Detailed Explanation:**

◆ **Correct Statements:**

- **Statement 2:** **ESZs** serve as **transition zones** between protected areas and human-dominated landscapes.
- **Statement 3:** **Environment (Protection) Act, 1986**, empowers the **central government** to declare **ESZs**.

◆ **Incorrect Statement:**

- **Statement 1:** **Forest (Conservation) Act, 1980** relates to **forest diversion**, **not ESZ notification**.

35) Answer: c) It emits its own energy and captures terrain data even through vegetation gaps

**Detailed Explanation:**

◆ **Key Concept:** **LiDAR** is an **active remote sensing** system that emits **laser beams** to measure distances.

◆ **Advantages Over Passive Systems:**

- Can **penetrate dense vegetation**.
- Effective in generating **3D digital elevation models (DEMs)** even in **forested regions**.

◆ **Application:** Used in archaeological surveys, floodplain mapping, forest structure analysis.

36) Answer: c) They interact extremely weakly with matter due to being chargeless

**Detailed Explanation:**

◆ **Key Concept:** Neutrinos are neutral, low-mass particles interacting via the weak nuclear force only.

◆ **Reason for Difficulty:**

- They can pass through entire planets without interacting.
- Requires large, sensitive detectors like Super-Kamiokande (Japan), INO (India proposed).

37) Answer: a) Their neutral buoyancy allows prolonged interaction with contaminants

**Detailed Explanation:**

◆ **Key Concept:** Nanobubbles (size <200 nm) remain suspended in water for long periods.

◆ **Benefits:**

- High surface area for contaminant interaction.
- Effective in biofilm removal, wastewater treatment, and microbial control.

◆ **Application Areas:** Agriculture, aquaculture, industrial water treatment.

38) Answer: d) Ensuring critical mineral supply chains for green and digital transitions

**Detailed Explanation:**

◆ **Key Objective:** Secure access to lithium, cobalt, nickel, and rare earths.

◆ **Importance:**

- For EV manufacturing, semiconductors, solar energy, and battery storage technologies.
- Supports India's Net-Zero 2070 goals and Atmanirbhar Bharat vision.

39) Answer: b) Only two

**Detailed Explanation:**

◆ **Correct Statements:**

- **Statement 1:** ICC tries individuals for genocide, crimes against humanity, war crimes, and crime of aggression.
- **Statement 3:** ICC can prosecute crimes committed by nationals of member states even outside their own territory.

◆ **Incorrect Statement:**

- **Statement 2:** ICC prosecutes individuals, not states.

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

**Detailed Explanation:**

◆ **Correct Explanation:**

- ASEAN's non-interference principle and consensus-based decision-making limit its action in Myanmar.
- Five-Point Consensus (2021) has seen limited implementation.

◆ **Consequences:** Myanmar crisis highlights ASEAN's institutional limitations.

◆ **Contemporary Example:** ASEAN has restricted Myanmar's military representatives from some summits but avoided sanctions.

41) Answer: c) Statement-I is correct but Statement-II is incorrect

**Detailed Explanation:**

◆ **Correct Statement:**

- **Statement I (Correct):**
  - Vietnam and the Philippines are among the world's most typhoon-prone countries.
  - Example: Typhoon Haiyan (2013) caused massive devastation in the Philippines.

◆ **Incorrect Statement:**

- **Statement II (Incorrect):**
  - Typhoons originate from the Western Pacific Ocean, not from the Atlantic Ocean.
  - Atlantic-origin storms impact Americas, not East/Southeast Asia.

◆ **Reason for High Typhoon Frequency:**

- Warm Pacific waters provide energy for cyclonic storms.
- Located in the Pacific Typhoon Belt.
- June to November: Peak season due to warm ocean currents and monsoon intensification.

42) Answer: a) A-2, B-3, C-1

**Detailed Explanation:**

◆ **Correct Matching:**

- **A. Central Arctic Ice Loss — 2:** Strengthens Rossby waves, causing increased rainfall in central and northern India.
- **B. Barents-Kara Sea Melt — 3:** Creates pressure anomalies, leading to decreased rainfall in central and northwest India.
- **C. Greenland Ice Melt — 1:** Has weak teleconnection with the Indian monsoon.

◆ **Mechanism:**

- Arctic ice melting alters atmospheric circulation.
- Disruption of jet streams affects Southwest Monsoon pattern in India.

43) Answer: c) Only three

**Detailed Explanation:**

◆ **Correct Statements:**

- **Statement 1 (Correct):** Demand-driven scheme: Workers must be provided work when demanded.
- **Statement 3 (Correct):** Applicable across all rural districts.
- **Statement 4 (Correct):** Gram Panchayats are key in planning and implementation.

◆ **Incorrect Statement:**



- **Statement 2 (Incorrect):** Employment must be provided **within 15 days** of demand, **not 30 days**.

### ◆ Importance of NREGA:

- Acts as a **rural safety net**.
- Supports **natural resource management** and **wage growth**.

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

### Detailed Explanation:

#### ◆ Correct Statements:

- **Statement 1:** Works under **Ministry of Finance**, exempted from **CRR and SLR** norms.
- **Statement 2:** Can issue both **tax-free** and **taxable bonds**.
- **Statement 3:** Plays a role in financing projects under the **National Infrastructure Pipeline (NIP)**.

#### ◆ Incorrect Statement:

- **Statement 4:** **NaBFID** does not construct public infrastructure; it **finances** projects.

#### ◆ Key Role:

- Bridge **long-term infrastructure financing gaps**.
- Promote **bond markets** and **project sustainability**.

45) Answer: c) All three

### Detailed Explanation:

#### ◆ Correct Matchings:

- **A. Har Khet Ko Pani** — **Ministry of Jal Shakti** — **Expansion of irrigation coverage**.
- **B. Per Drop More Crop** — **Dept. of Agriculture & Farmers Welfare** — **Improved water productivity**.
- **C. Watershed Component** — **Ministry of Rural Development** — **Soil-moisture retention in drylands**.

#### ◆ Integrated Strategy:

- Enhances **water use efficiency**.
- Expands **irrigation coverage**.
- Promotes **sustainable agriculture** through **watershed management**.

- **Objective:** Ensure **water security** for every farm ("Har Khet Ko Pani").

46) Answer: c) Only three

### Detailed Explanation:

#### ◆ Correct Statements:

- **Statement 1:** Aircrafts using **autopilot navigation** based on GPS can be **misguided to wrong coordinates** if spoofed.
- **Statement 2:** Banks rely on **GPS-based time synchronization**; spoofing can cause **time drift**, leading to **transaction failures**.
- **Statement 3:** **Naval vessels** can be **misled into wrong territorial waters**, raising **geopolitical tensions**.

#### ◆ Incorrect Statement:

- **Statement 4:** **GPS spoofing** affects **receivers**, **not satellites**; **no root access** to satellites is possible through spoofing.

- ◆ **Key Insight:** GPS spoofing is a major threat to **aviation**, **maritime security**, and **financial sectors**.

47) Answer: b) Only two

### Detailed Explanation:

#### ◆ Correct Statements:

- **Statement 2:** Mimics **Type 1 Diabetes symptoms** (e.g., polyuria, polydipsia), but has **atypical insulin responses**.
- **Statement 3:** Prevalent in **Africa and South Asia** where **chronic malnutrition** is widespread.

#### ◆ Incorrect Statement:

- **Statement 1:** **Not linked to high BMI**; affects **lean, undernourished individuals**.

- ◆ **Contextual Note:** **Global undernutrition** hotspots show rising cases of **Type 5 Diabetes**, a largely **underdiagnosed** category.

48) Answer: c) It serves as a **global open-access database** for **water resources** and **agricultural water use**

### Detailed Explanation:

#### ◆ Key Function:

- **AQUASTAT** is an **open-access platform** developed by **FAO**.
- Provides **data on irrigation**, **water withdrawal**, and **efficiency indicators** for over **180 variables**.

#### ◆ Incorrect Options Explained:

- **Not a regulatory agency** (Option a, d).
- **Not a funding body** like GEF (Option b).

#### ◆ Relevance:

- Supports monitoring of **SDG 6.4** (**water use efficiency**).

49) Answer: a) To build **scalable quantum systems** ranging from **50 to 1000 qubits**

### Detailed Explanation:

#### ◆ Goal of NQM:

- Develop **intermediate-scale quantum computers** (**50–1000 qubits**).
- Propel **quantum research** in **computing**, **communication**, **sensing**, and **materials**.

- ◆ **Mission Timeline:** **2023–2031** with a budget of **₹6,003.65 crore**.

#### ◆ Key Components:

- Establish **four thematic hubs** (T-Hubs) across quantum fields.
- Promote India's **global leadership** in **quantum technology**.

50) Answer: b) Only two

### Detailed Explanation:

#### ◆ Correct Statements:

- **Statement 2:** Supports **Google's AI workloads** like **Search** and **YouTube recommendations**.
- **Statement 3:** Offers **higher energy efficiency** than traditional **CPUs/GPUs** for **AI-specific tasks**.

◆ **Incorrect Statement:**

- **Statement 1:**
  - Not a general-purpose microprocessor; not used in Android phones.

- Designed for **Google Cloud AI Infrastructure**.

◆ **Key Feature:** Focused on processing tensors and accelerating neural networks.



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