

Solutions

DATE : 24th Feb- 2nd March

1) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct:** The Strait of Gibraltar connects the Mediterranean Sea to the Atlantic Ocean and serves as a vital maritime passage.
 - **Statement 2 is correct:** It lies between the southern tip of Spain and northern Morocco, acting as a natural border between Europe and Africa.
 - **Statement 3 is incorrect:** The Bosphorus Strait, not the Strait of Gibraltar, connects the Black Sea with the Mediterranean Sea.

2) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is incorrect:** India accounts for around 25% of the global rare disease burden, not just 2%. Approximately 9-10 crore Indians suffer from rare diseases.
 - **Statement 2 is correct:** Thalassemia and Muscular Dystrophy are both classified as rare diseases in India.
 - **Statement 3 is incorrect:** Rare diseases in India are not usually detected within two years of birth. The average time for diagnosis is around 4.8 years, leading to delayed treatment and complications.

3) Correct Answer: (b) Turkey

- **Explanation:**
 - Turkey shares borders with the Black Sea, Mediterranean Sea, and Aegean Sea, giving it access to multiple water bodies.
 - Iran, Saudi Arabia, and Egypt do not border as many seas as Turkey.

4) Correct Answer: (d) 1-a, 2-b, 3-c

- **Explanation:**
 - **Thalassemia (1-a):** A genetic disorder affecting oxygen transport in the blood due to abnormalities in hemoglobin.
 - **Acquired Aplastic Anaemia (2-b):** A condition where the bone marrow fails to produce blood cells, leading to anemia and immune deficiency.
 - **Paediatric Cardiomyopathy (3-c):** A disease affecting the muscles of the heart, causing heart failure in children.

5) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is incorrect:** There is no rotation policy based on regional Supreme Court benches. The CJI is appointed based on seniority.
 - **Statement 2 is correct:** Merit and integrity are considered along with seniority in CJI appointments.
 - **Statement 3 is incorrect:** The CJI is not selected by a committee of Supreme Court judges. Instead, the outgoing CJI recommends the senior-most judge to the President, following convention.

6) Correct Answer: (c) Only three

- **Explanation:**
 - **Statement 1 is correct:** Quartz crystal oscillators are essential components of atomic clocks, providing a base frequency.
 - **Statement 2 is correct:** Atomic clocks rely on the vibration of caesium atoms (or other atoms like rubidium) for accurate timekeeping.
 - **Statement 3 is correct:** Atomic clocks compare atomic vibrations with quartz oscillators to ensure precision.
 - **Statement 4 is incorrect:** Atomic clocks are more accurate than GPS satellites. In fact, GPS satellites use atomic clocks to maintain precision.

7) Correct Answer: (c) The Global Stocktake's primary focus is on monitoring fossil fuel consumption and reducing coal usage.

- **Explanation:**
 - The Global Stocktake (GST) under the Paris Agreement assesses the overall progress toward global climate goals, not just fossil fuel consumption.
 - Nuclear energy was included in GST for the first time at COP28 (2023) as a key low-carbon energy source.
 - The GST evaluates national contributions toward reducing emissions and promoting sustainable energy.

8) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct:** The GI tag protects products from unauthorized use outside their registered geographical area.
 - **Statement 2 is correct:** GI registration enhances marketability and boosts exports by linking products to their region of origin.
 - **Statement 3 is incorrect:** A GI tag cannot be transferred or assigned to producers outside the geographical area. It is tied to the specific location and its characteristics.

9) Correct Answer: (b) 2, 3, and 4 only

- **Explanation:**
 - **Statement 1 is incorrect:** USSD works on 2G, 3G, 4G, and 5G networks, not just 4G and 5G.
 - **Statement 2 is correct:** USSD does not require an internet connection, making it accessible even on basic mobile phones.
 - **Statement 3 is correct:** USSD messages are limited to 182 characters, restricting data transmission.
 - **Statement 4 is correct:** USSD is widely used for mobile services like banking, balance checks, and call forwarding.

10) Correct Answer: (b) Electrons flow from the anode to the cathode through the electrolyte, generating an electric current.

- **Explanation:**
 - **Statement a is correct:** Hydrogen fuel cells produce water vapor and heat as byproducts.
 - **Statement b is incorrect:** Electrons do not flow through the electrolyte. Instead, they travel from the

anode to the cathode through an external circuit, generating electricity.

- **Statement c is correct: Water is formed at the cathode by combining protons, electrons, and oxygen.**
- **Statement d is correct: Hydrogen molecules are split into protons and electrons at the anode.**

11) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct: The Strait of Hormuz connects the Persian Gulf to the Gulf of Oman.** It is a strategically important waterway for global trade.
 - **Statement 2 is correct: The Strait of Hormuz is one of the world's most critical chokepoints for oil shipments,** with a significant portion of the world's crude oil passing through it.
 - **Statement 3 is incorrect: The strait does not lie between the southern tip of Saudi Arabia and the Horn of Africa.** Instead, it is located between Oman (on the Arabian Peninsula) and Iran.

12) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is correct: Over 75% of rare disease cases in India affect children,** often due to genetic factors and early-onset disorders.
 - **Statement 2 is incorrect: Most patients with rare diseases do not survive into adulthood** due to a lack of treatment and medical infrastructure.
 - **Statement 3 is correct: The National Policy for Rare Diseases 2021 provides financial assistance** for the treatment of rare diseases.

13) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct: Fluorescent Nanodiamonds (FNDs) are used in high-resolution imaging** due to their ability to remain stable under light exposure and in harsh conditions.
 - **Statement 2 is correct: FNDs are sensitive to electric fields,** making them valuable in detecting electromagnetic signals.
 - **Statement 3 is incorrect: FNDs are not being explored as a replacement for traditional energy sources** in renewable energy technologies.

14) Correct Answer: (b) 1, 3, and 4 only

- **Explanation:**
 - **Statement 1 is correct: Superconductors are widely used in MRI machines** because they carry large currents without resistance, enabling powerful magnetic fields.
 - **Statement 2 is incorrect: Superconductors are not widely used in electrical grids** due to high costs and the challenge of maintaining low temperatures.
 - **Statement 3 is correct: High-temperature superconductors require temperatures below -100°C** to function optimally.
 - **Statement 4 is correct: Superconductors enable magnetic levitation trains (maglev)** by generating strong magnetic fields that allow frictionless movement.

15) Correct Answer: (d) Blood type analysis

- **Explanation:**
 - **Blood type analysis is not a method used for age estimation.** It only determines an individual's blood group, not their age.

- **Radiographic techniques use X-rays to assess bone development.**
- **Ossification tests analyze bone growth and fusion.**
- **Epigenetic clock techniques estimate biological age by examining DNA methylation patterns.**

16) Correct Answer: (a) 3 only

- **Explanation:**
 - **Statement 1 is incorrect: The Prime Minister has no role** in the appointment of the Chief Justice of India.
 - **Statement 2 is incorrect: The President cannot arbitrarily reject the recommendation** of the outgoing CJI, as the appointment follows established conventions.
 - **Statement 3 is correct: The Memorandum of Procedure (MoP) is a guideline document that lays out the process for appointing the CJI.**

17) Correct Answer: (c) All three

- **Explanation:**
 - **Statement 1 is incorrect: The Mekong River is not the longest river in Asia; the Yangtze River is the longest.**
 - **Statement 2 is incorrect: The Mekong River flows into the South China Sea, not the Bay of Bengal.**
 - **Statement 3 is incorrect: The Mekong River is not navigable year-round for large vessels** due to natural barriers and seasonal variations.

18) Correct Answer: (d) 1, 2, and 3

- **Explanation:**
 - **Statement 1 is correct: The Citizenship Act, 1955 bars illegal immigrants** from obtaining Indian citizenship unless exceptions are granted.
 - **Statement 2 is correct: Section 6A was introduced after the Assam Accord (1985)** to address large-scale migration post the Bangladesh Liberation War (1971).
 - **Statement 3 is correct: Citizenship is governed under Part II of the Constitution,** and citizenship matters fall under the Union List.

19) Correct Answer: (b) 1 and 2 only

- **Explanation:**
 - **Statement 1 is correct: The Paris Convention (1883) was one of the first international agreements** to recognize Geographical Indications (GIs).
 - **Statement 2 is correct: The TRIPS Agreement (WTO) protects Geographical Indications** under its intellectual property framework.
 - **Statement 3 is incorrect: The Madrid Agreement is for international trademark registration,** not specifically for GIs.

20) Correct Answer: (c) ADR is a partisan organization that aligns itself with specific political parties.

- **Explanation:**
 - **ADR is a non-partisan organization.** It does not support any political party but works for electoral transparency and reforms.
 - **ADR advocates for inner-party democracy and transparency in political funding.**
 - **ADR empowers voters by providing information on candidates' backgrounds** to promote accountable governance.

21) Correct Answer: (d) Promoting global cooperation in technology governance

- **Explanation:**
 - The **Global Digital Compact (GDC)** emphasizes **global cooperation** in the governance of digital technologies.
 - It promotes **responsible data management and ethical AI use**.
 - The GDC is **non-binding** but encourages inclusive and sustainable digital advancements in alignment with the **UN 2030 Agenda** and international laws.

22) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is correct:** The **Red Sea** separates the **Arabian Peninsula** from **Africa**.
 - **Statement 2 is incorrect:** Apart from **Egypt** and **Saudi Arabia**, **Yemen**, **Sudan**, and **Eritrea** also border the **Red Sea**.
 - **Statement 3 is correct:** The **Red Sea** connects to the **Mediterranean Sea** via the **Suez Canal** in **Egypt**.

23) Correct Answer: (b) 1 and 2 only

- **Explanation:**
 - **Statement 1 is correct:** India has introduced a **digital crowdfunding portal** for raising funds to support rare disease patients.
 - **Statement 2 is correct:** The **Production Linked Incentive (PLI)** scheme supports **orphan drug manufacturing** to reduce dependence on imports.
 - **Statement 3 is incorrect:** **Customs duty waivers** are granted for **personal use**, not for commercial imports of rare disease drugs.

24) Correct Answer: (c) Red Sea and Gulf of Aden

- **Explanation:**
 - The **Bab el-Mandeb Strait** connects the **Red Sea** with the **Gulf of Aden**.
 - It is a **critical maritime chokepoint** for trade routes linking the **Indian Ocean** and the **Mediterranean Sea** via the **Suez Canal**.

25) Correct Answer: (a) Uses a carbon-rich gas under controlled temperature and pressure to form diamonds

- **Explanation:**
 - **CVD** involves a **vacuum chamber** filled with a **carbon-rich gas** (e.g., **methane**).
 - Under **controlled temperature and pressure**, the gas is ionized, and **carbon atoms crystallize on a diamond seed**.
 - The **High-Pressure High-Temperature (HPHT)** method, in contrast, simulates volcanic conditions.

26) Correct Answer: (d) Detect and study gravitational waves

- **Explanation:**
 - **SKAO** is an **international radio telescope project** designed to **detect gravitational waves**, study galaxies, and search for extra-terrestrial life.
 - It does not focus on **Mars exploration**, **communication satellites**, or **new energy sources**.

27) Correct Answer: (d) Torres Strait

- **Explanation:**
 - The **Torres Strait** connects the **Coral Sea** and the **Arafura Sea**, located between **Australia** and **New Guinea**.
 - It is a **crucial maritime route** in the region.

28) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is incorrect:** **FNDs** emit **light of a lower frequency** than they absorb (this is the principle of fluorescence).
 - **Statement 2 is correct:** **FNDs** have a **longer fluorescence lifespan**, making them useful in imaging applications.
 - **Statement 3 is correct:** **FNDs** are **valuable in quantum technologies** due to their **unique optical properties**.

29) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct:** The **Bailadila mines** in **Chhattisgarh** are known for **high-grade iron ore**.
 - **Statement 2 is correct:** India has **more hematite reserves** than magnetite.
 - **Statement 3 is incorrect:** **Most of India's iron ore mines** are located **inland**, not along the coast.

30) Correct Answer: (a) 1 and 2 only

- **Explanation:**
 - **Statement 1 is correct:** **Broadband** provides **high-speed internet** and allows **two-way communication**.
 - **Statement 2 is correct:** **Broadcast technology** is primarily used for **one-way communication**, such as **TV** and **radio transmission**.
 - **Statement 3 is incorrect:** **Broadcast** does not support **real-time two-way communication**.

31) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is incorrect:** **Shivaji** was **not the first ruler** to establish a **standing army**. Earlier rulers like **Alauddin Khilji** had standing armies.
 - **Statement 2 is correct:** **Shivaji** effectively used **guerrilla warfare tactics (Ganimi Kawa)** against the **Mughals**, employing swift movements and strategic terrain advantages.
 - **Statement 3 is incorrect:** **Shivaji's administration** was **decentralized**, unlike the **Mughal centralized model**. He implemented a system of local governance and efficient revenue collection.

32) Correct Answer: (b) North Equatorial Current

- **Explanation:**
 - The **North Equatorial Current** brings warm waters from the **Pacific Ocean** to the **Andaman Sea**, affecting monsoon patterns and marine biodiversity.
 - **Agulhas Current (Indian Ocean)**, **Benguela Current (South Atlantic)**, and **Humboldt Current (South America)** do not influence the **Andaman Sea**.

33) Correct Answer: (c) To redistribute land and resources to oppressed communities

- **Explanation:**
 - The **Naxalite movement** originated in **1967** in **Naxalbari, West Bengal** with the aim of **redistributing land and resources to marginalized communities**, particularly peasants.
 - Inspired by **Maoist ideology**, it sought **armed rebellion** against the dominance of landlords and elites.

34) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is incorrect:** The sanctuary is **not dominated by tropical rainforests**; instead, it consists of **dry deciduous forests**.
 - **Statement 2 is correct:** The sanctuary has **teak and bamboo**, which are characteristic of dry deciduous forests.
 - **Statement 3 is incorrect:** The sanctuary is **inland and not influenced by mangrove ecosystems**, which are found in coastal areas.

35) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct:** The NAC provides **crop-specific standards** for major crops like **paddy, wheat, oilseeds, and pulses**.
 - **Statement 2 is incorrect:** The NAC **does not exclusively focus on organic farming**; it also covers **natural and conventional farming**.
 - **Statement 3 is correct:** The NAC **promotes sustainability and modern techniques**, including **SMART farming and traceability**.

36) Correct Answer: (c) UN 'Summit of the Future'

- **Explanation:**
 - The **Global Digital Compact (GDC)** was introduced at the **UN's 'Summit of the Future'** to promote **digital governance, ethical AI use, and data privacy**.
 - It is a **non-binding agreement** aimed at addressing **digital inequalities and sustainable technology use**.

37) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is correct:** The **PM-MITRA** scheme aims to **establish world-class industrial infrastructure** for the textile industry.
 - **Statement 2 is correct:** It **establishes integrated textile parks** to attract investments and boost exports.
 - **Statement 3 is incorrect:** The scheme **does not focus solely on traditional textile manufacturing**; it **modernizes the industry using advanced technology**.

38) Correct Answer: (d) 1 and 2 only

- **Explanation:**
 - **Statement 1 is correct:** Slag undergoes **lithification, mimicking natural geological processes** to form sedimentary rock.
 - **Statement 2 is correct:** Slag lithification **helps sequester carbon dioxide**, reducing atmospheric greenhouse gases.
 - **Statement 3 is incorrect:** Slag **does not increase soil acidity**; rather, it can improve soil quality and **reduce carbon emissions** from the steel industry.

39) Correct Answer: (d) Black Sea

- **Explanation:**
 - The **Black Sea** lies between **Turkey and Russia** and is connected to the **Mediterranean Sea** via the **Bosphorus Strait**.

40) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct:** LGDs are created in **laboratories using processes that replicate natural diamond formation**.
 - **Statement 2 is correct:** The **Chemical Vapor Deposition (CVD) method** grows diamonds at temperatures around **800°C**.
 - **Statement 3 is incorrect:** LGDs are **chemically identical to natural diamonds**, as both are made of **pure carbon**.

41) Correct Answer: (c) A-3, B-4, C-1, D-2

- **Explanation:**
 - **Balwant Rai Mehta Committee (1957)** – **Three-tier Panchayati Raj system (Village, Block, District)**.
 - **Ashok Mehta Committee (1978)** – **Two-tier Panchayati Raj system (District, Mandal)**.
 - **GVK Rao Committee (1985)** – **Strengthened the role of Zilla Parishads in rural development**.
 - **LM Singhvi Committee (1986)** – **Recommended constitutional status for Panchayati Raj Institutions (PRIs)**.

42) Correct Answer: (c) A is correct, but R is incorrect.

- **Explanation:**
 - **Constitutional morality** upholds the rule of law, individual rights, and democratic values.
 - **Governance must be based on constitutional principles, not popular sentiment**.
 - **The Reason (R) is incorrect** because governance cannot prioritize public opinion over constitutional values.

43) Correct Answer: (a) Only one

- **Explanation:**
 - **Statement 1 is incorrect:** Tea and coffee exports are regulated by the **Tea Board and Coffee Board of India, not APEDA**.
 - **Statement 2 is incorrect:** **ANARNET** is a traceability system for **pomegranates, not dairy products**.
 - **Statement 3 is correct:** **APEDA** promotes **GI-tagged products** like **Basmati rice and Alphonso mangoes**.

44) Correct Answer: (b) Only two

- **Explanation:**
 - **Statement 1 is correct:** Salaries of **CEC and ECs** come from the **Consolidated Fund of India**, ensuring financial independence.
 - **Statement 2 is incorrect:** Election Commissioners can be removed by the **President only upon the CEC's recommendation**.
 - **Statement 3 is incorrect:** **ECI** cannot amend the **Representation of the People Act, 1951**; only **Parliament** can.

45) Correct Answer: (d) Neither 1 nor 2

- **Explanation:**
 - **Statement 1 is incorrect:** **DICGC** does not charge a **uniform insurance premium** across all banks; premiums depend on financial stability.
 - **Statement 2 is incorrect:** Depositors cannot directly claim compensation from **DICGC**; they must wait for **RBI** to initiate bank liquidation or restructuring.

46) Correct Answer: (b) Only two

- Explanation:
 - Battle of Pratapgad (1659) – Shivaji personally led the fight against Afzal Khan.
 - Battle of Purandar (1665) – Shivaji was involved but had to sign a treaty with the Mughals.
 - Battle of Sinhagad (1670) – Led by Tanaji Malusare, not directly by Shivaji.
 - Battle of Palkhed (1728) – Fought by Peshwa Baji Rao I, not Shivaji.

47) Correct Answer: (a) Applying for leave of absence from the Committee on Members' Absence

- Explanation:
 - MPs must seek leave of absence from the Committee on Members' Absence to retain their seat.
 - Neither the Election Commission nor the PMO can grant exemption.
 - The Supreme Court cannot intervene before the 60-day period ends.

48) Correct Answer: (b) Only two

- Explanation:
 - Statement 1 is correct: Fishing, including tuna and deep-sea fisheries, is legally permitted.

- Statement 2 is correct: Hydrocarbon exploration for oil and gas is allowed.
- Statement 3 is incorrect: Coral reef mining is strictly prohibited under environmental laws.

49) Correct Answer: (c) Only three

- Explanation:
 - Statement 1 is incorrect: NCrF is not compulsory for all institutions.
 - Statement 2 is correct: NCrF allows flexible credit transfer across educational streams.
 - Statement 3 is correct: NCrF promotes experiential learning through apprenticeships and on-the-job training.
 - Statement 4 is correct: NCrF integrates performing arts and social work into the credit system.

50) Correct Answer: (d) Kinetic energy from ocean waves

- Explanation:
 - Wave energy conversion harnesses the kinetic energy of ocean waves to generate electricity.
 - It is different from tidal energy (influenced by the Moon's gravitational pull) and thermal energy conversion (based on temperature differences).



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