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From

23rd to 28th Mar 2026

INDEX

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POLITY & GOVERNANCE

1.1. JOINT PARLIAMENTARY COMMITTEE (JPC)

Context:

Recently, the Lok Sabha referred the **Corporate Laws (Amendment) Bill, 2026** to a Joint Parliamentary Committee (JPC) for detailed examination. Union Finance Minister Nirmala Sitharaman proposed the motion to allow for wider stakeholder scrutiny regarding amendments to the Companies Act, 2013, and the Limited Liability Partnership Act, 2008.

1. **Nature and Status**
   - **Ad-hoc Committee:** A JPC is a temporary (ad-hoc) body constituted by the Parliament for a specific purpose and a fixed duration.
   - **Dissolution:** The committee ceases to exist once it completes its assigned task and submits its report to the Parliament.
   - **Bipartisan Representation:** It consists of members from both the ruling coalition and the opposition parties, ensuring a balanced scrutiny of controversial issues.
2. **Composition and Formation**
   - **Creation:** A JPC is set up through a motion passed in one House (usually the Lok Sabha) and concurred with by the other House. Alternatively, the presiding officers of both Houses can communicate to form a joint committee.
   - **Membership Ratio:** The strength of a JPC is not fixed by any permanent rule but is decided by the motion. Conventionally, the ratio of members from the **Lok Sabha to the Rajya Sabha is 2:1**.
     Example: For a 31-member committee, 21 members are from the Lok Sabha and 10 from the Rajya Sabha.
   - **Appointment:** Members are either elected or nominated by their respective Houses. The Chairperson is typically a member of the Lok Sabha, appointed by the Speaker.
3. **Powers and Functions**
   - **Investigative Authority:** A JPC can investigate financial irregularities, major scams, or complex legislative bills (like the Corporate Laws Amendment Bill).
   - **Summoning Powers:** It has the power to summon individuals, experts, or government officials to give oral evidence and can demand the production of confidential documents.
   - **Confidentiality:** The proceedings of the committee are generally confidential, though the final report is tabled in the House.
   - **Dispute Resolution:** Any dispute regarding the relevance of evidence or the production of documents is resolved by the Speaker of the Lok Sabha.

4. **Recommendations and Accountability**
   - **Advisory Nature:** The recommendations made by a JPC are **persuasive and advisory**, meaning they are not legally binding on the Government.
   - **Action Taken Report (ATR):** While the government may reject the recommendations, it is mandatory to submit an 'Action Taken Report' to the Parliament, explaining the steps taken or reasons for non-implementation.
5. **JPC vs. Standing Committees**

Feature	Joint Parliamentary Committee (JPC)	Standing Committees (DRSCs)
Duration	Temporary (Ad-hoc)	Permanent (Reconstituted annually)
Scope	Specific issue or Bill	Subject-specific (Ministry-wise)
Powers	Higher investigative powers (Summoning)	Focused on budget and policy review

Q. With reference to the Joint Parliamentary Committee (JPC) in India, consider the following statements:

1. A JPC is a permanent body of the Parliament whose members are nominated by the President of India.
2. The strength of the committee is fixed at 31 members by the Rules of Procedure of the Lok Sabha.
3. The recommendations of a JPC are binding on the government if the report is passed by a simple majority in both Houses.

Which of the statements given above is/are correct?

A) 1 and 2 only

B) 2 and 3 only

C) 1 and 3 only

D) Neither 1, 2 nor 3

Solution: D

- **STATEMENT 1 IS INCORRECT:** A JPC is an **ad-hoc (temporary)** committee, not a permanent one. Its members are elected or nominated by the Houses of Parliament, not the President.
- **STATEMENT 2 IS INCORRECT:** The strength of a JPC is **not fixed** by the Rules of Procedure; it is decided by the motion that creates the specific committee, though a 2:1 ratio (e.g., 31 members) is a common convention.
- **STATEMENT 3 IS INCORRECT:** The recommendations of a JPC are **advisory and persuasive** in nature; they are never legally binding on the executive government.

1.2. FOREIGN CONTRIBUTION (REGULATION) ACT

Context:

The Union Government is likely to introduce the **Foreign Contribution (Regulation) Amendment Bill, 2026**, during the ongoing session of Parliament to streamline the management of foreign funds and assets created by NGOs.

1. **Key Proposed Legislative Changes**
   - **Designated Authority**: A new provision allows for the appointment of a "designated authority" to take over, manage, or dispose of assets created out of foreign funds by an NGO whose registration has been suspended, cancelled, or not renewed.
   - **Expansion of "Key Functionary"**: The definition of a "key functionary" of an NGO is being expanded beyond directors and office bearers to include partners, trustees, and the **Karta** of a Hindu Undivided Family.
   - **Reduction in Penalties**: The Bill proposes to reduce the maximum imprisonment for FCRA-related offences from **five years to one year**.
   - **Liability**: Key functionaries will now be held directly liable for offences committed under the Act.
   - **Investigation Approval**: Law enforcement agencies or State governments must seek **prior approval** from the Central Government before initiating investigations into FCRA-related complaints (Amendment to Section 43).
   - **Fund Utilization Timelines**: The Bill proposes fixed timelines for the utilization of foreign funds received under the "prior permission" category.
2. **Understanding FCRA**
   - The FCRA, enacted in 1976 during the Emergency, governs the acceptance and utilization of foreign contributions by individuals, associations, and organizations in India.
   - **Objective:** Safeguarding sovereignty and democracy; Ensures that foreign funds are not used to affect electoral politics, public opinion, or policymaking in ways that undermine **national interest.**
   - **Governing Institution: The Union Ministry of Home Affairs (MHA**) is the nodal ministry responsible for the registration, monitoring, and enforcement of the FCRA**.**
   - **FCRA, 2010 act:** It has been enacted by the Parliament **to consolidate the law to regulate the acceptance and utilization of foreign contribution** or foreign hospitality by certain individuals or associations or companies and to prohibit acceptance and utilization of foreign contribution or foreign hospitality for any activities detrimental to national interest and for matters connected therewith or incidental thereto.
   - **In terms of FCRA, 2010 "person" includes** –
     - an individual;
     - a Hindu undivided family;
     - an association;
     - a company registered under section 25 of the Companies Act,1956 (now Section 8 of Companies Act, 2013).
   - **Prohibitions: Certain entities are strictly prohibited from receiving foreign contributions, including:**
     - Candidates for election.
     - Members of any Legislature (MP/MLA).
     - Political parties or their office-bearers.

- Judges and government servants.
- Publishers/Editors of registered newspapers.

- **Key Amendments (2020):**
  - **Aadhaar Requirement**: Made Aadhaar mandatory for all office-bearers of NGOs.
  - **FCRA Account**: Required all foreign contributions to be received only in a designated "FCRA Account" opened in the **State Bank of India, New Delhi Main Branch**.
  - **Administrative Expenses**: Capped the use of foreign funds for administrative purposes at **20%** (reduced from the earlier 50%).
  - **Prohibition on Transfer**: Prohibited the transfer of foreign contributions to any other person or organization.
- **2022 Amendments:**
  - **Higher threshold for reporting foreign funds (from relatives):** Limit increased from ₹1 lakh → ₹10 lakh.
  - **Extended reporting time (foreign contribution from relatives):** Time increased from 30 days → 3 months.

Q. Which of the following are prohibited from receiving foreign contributions under FCRA?

1. Election candidates
2. Members of Legislature
3. Judges
4. Government servants

Select the correct answer using the code below:

(a) 1 and 2 only

(b) 1, 2 and 3 only

(c) 2, 3 and 4 only

(d) 1, 2, 3 and 4

Answer: D

Explanation:

According to the Act, the following are prohibited:

1. **Election Candidates:** To prevent foreign interference in the democratic electoral process.
2. **Members of Legislature:** This includes Members of Parliament (MPs) and Members of Legislative Assemblies (MLAs).
3. **Judges:** To maintain the independence and impartiality of the judiciary.
4. **Government Servants:** Includes any person in the service or pay of the Government or remunerated by the Government for the performance of any public duty.

1.3. SUPREME COURT JUDGEMENT ON SC STATUS

Context:

Recently, the Supreme Court of India, in a significant judgment reaffirmed that the Scheduled Caste status is essentially tied to specific religious identities as per the **Constitution (Scheduled Castes) Order, 1950**. The court held that any person professing a religion other than **Hinduism, Sikhism, or Buddhism** automatically loses their Scheduled Caste status and the associated benefits, such as reservation and protection under the **SC/ST (Prevention of Atrocities) Act**, regardless of their birth. This ruling emphasizes that conversion to Christianity or Islam results in the immediate cessation of SC entitlements because these religions are theologically considered to not recognize the institution of caste.

Key Legal and Constitutional Provisions

- **Article 341:** This article empowers the **President** to specify the castes, races, or tribes which shall be deemed to be Scheduled Castes in relation to a particular State or Union Territory.
- **Constitution (Scheduled Castes) Order, 1950:** Initially, only Hindus were eligible for SC status. It was amended in **1956** to include Sikhs and in **1990** to include Buddhists.
- **The "Profess" Criteria:** The Supreme Court clarified that "professing" a religion involves a public declaration or practice. A person cannot "simultaneously profess" a non-notified religion (like Christianity) and claim SC benefits.
- **Re-conversion:** For a person to reclaim SC status after re-converting to Hinduism, Sikhism, or Buddhism, they must establish their original caste identity and show that they have been accepted back by their original community.

Landmark Verdict on Sub-Classification (Davinder Singh Case)

While the recent 2026 ruling focused on religion, a landmark **7-judge Constitution Bench** ruling (2024) drastically changed the landscape of SC reservations:

- **Overruled E.V. Chinnaiah (2004):** The court overturned the previous view that SCs are a "homogeneous group."
- **Permissibility of Sub-classification:** States are now permitted to sub-classify SCs and STs to provide preferential treatment (sub-quotas) to the "more backward" groups within these categories.
- **Empirical Data Requirement:** States must justify sub-classification based on **quantifiable and demonstrable data** regarding the inadequacy of representation; it cannot be done based on political whims.
- **Creamy Layer Concept:** For the first time, a majority of judges observed that the "creamy layer" principle (excluding the affluent) should also be applied to SCs and STs to ensure benefits reach the most needy.

Q. Consider the following statements regarding the Scheduled Caste (SC) status in India:

1. The President has the sole authority to include or exclude a caste from the Scheduled Castes list through a public notification under Article 341.
2. According to the Constitution (Scheduled Castes) Order 1950, a person belonging to a Scheduled Caste community retains their status even after converting to Islam or Christianity.
3. The Supreme Court has ruled that States can sub-classify Scheduled Castes to provide sub-quotas, provided they have empirical data to justify the move.

Which of the statements given above is/are correct?

A) 1 and 2 only

B) 3 only

C) 1 and 3 only

D) 1, 2, and 3

Solution: B

- **STATEMENT 1 IS INCORRECT:** While the President issues the initial notification, any subsequent **inclusion or exclusion** from the list can only be done by **Parliament** by law (Article 341(2)).
- **STATEMENT 2 IS INCORRECT:** As per the recent Supreme Court ruling and the 1950 Order, SC status is lost immediately upon conversion to religions other than Hinduism, Sikhism, or Buddhism.
- **STATEMENT 3 IS CORRECT:** In the *Davinder Singh* case, the Supreme Court upheld the power of States to sub-classify based on empirical data to ensure benefits reach the most disadvantaged sub-groups.

1.4. TRANSGENDER PERSONS (PROTECTION OF RIGHTS) AMENDMENT BILL, 2026

Context:

Recently, the Parliament passed the **Transgender Persons (Protection of Rights) Amendment Bill, 2026**, with the Rajya Sabha giving its approval on March 25, 2026, following the Lok Sabha's passage of the Bill on the previous day. This legislative move has sparked intense national debate as it significantly alters the 2019 framework by shifting the legal recognition of transgender individuals from a "self-identification" model to a biological and medicalized framework.

Key Features of the Amendment Bill, 2026

1. **Redefining "Transgender Person"**

   The Bill narrows the definition provided in the 2019 Act. It now specifically recognizes:

   - Individuals belonging to socio-cultural identities such as **Kinner, Hijra, Aravani, and Jogta**.
   - Persons with **intersex variations** or congenital variations in sex characteristics (chromosomal patterns, gonadal development, or hormones).

- Crucially, it **excludes** those who identify as transgender based on "self-perceived gender identity" or "gender fluidity" if they do not fit the biological or socio-cultural criteria.

2. **Removal of Self-Identification**
   - The 2019 Act allowed a person to obtain a certificate of identity based on their self-perceived gender.
   - The 2026 Amendment **removes the right to self-determination**. Legal recognition is now tied to a bureaucratic and medical verification process.
3. **New Certification Process**
   - **Authority:** A Medical Board, typically headed by a Chief Medical Officer (CMO), is now the primary authority for assessing applicants.
   - **Role of DM:** The District Magistrate will issue the Certificate of Identity only after receiving recommendations from the Medical Board.
   - **Medical Intervention:** The Bill introduces oversight on gender-affirming procedures, requiring medical institutions to report such care to district authorities.
4. **Enhanced Penal Provisions**

   The Bill introduces "graded punishments" to reflect the gravity of offences:
   - **Forced Identity:** Compelling an adult to assume a transgender identity through force or deceit carries a sentence of **10 years to life imprisonment**.
   - **Offences against Children:** Forcing a child into a transgender identity or engaging them in forced begging/bonded labour carries a penalty of **10 to 14 years** (or life) and heavy fines.
   - **Exploitation:** Harsher punishments are set for those who force transgender persons into servitude or traditional begging systems against their will.

Comparison: 2019 Act vs. 2026 Amendment

Feature	Transgender Persons Act, 2019	Amendment Bill, 2026
Basis of Identity	Self-perceived gender identity.	Biological traits & socio-cultural groups.
Certification	Administrative (DM issues based on application).	Medical (DM issues based on Medical Board report).
Inclusivity	Broad; included trans-men, trans-women, non-binary.	Narrow; focuses on Intersex and specific groups.
Punishment	6 months to 2 years for most offences.	5 years to Life Imprisonment (Graded).

Constitutional & Legal Concerns

- **Violation of NALSA v. Union of India (2014):** The Supreme Court held that the right to self-identify one's gender is a fundamental right under **Article 21**. Critics argue the Bill reverses this judicial mandate.
- **Right to Privacy (Puttaswamy Case, 2017):** Mandatory medical examinations are seen as an intrusion into an individual's "bodily autonomy" and "informational privacy."

- **Article 14 (Equality):** By creating a distinction between "biological" transgender persons and others, the Bill is accused of creating an arbitrary classification that lacks a rational nexus.

Q. With reference to the Transgender Persons (Protection of Rights) Amendment Bill, 2026, consider the following statements:

1. The Bill mandates that the "Certificate of Identity" can only be issued by a District Magistrate after a recommendation from a designated Medical Board.
2. It explicitly recognizes "self-perceived gender identity" as the primary basis for legal recognition, upholding the NALSA judgment.
3. The Bill introduces life imprisonment as a potential punishment for those who forcibly compel a child to assume a transgender identity.

How many of the statements given above are correct?

A) Only one

B) Only two

C) All three

D) None

Solution: B) Only two

- **STATEMENT 1 IS CORRECT:** Under the 2026 Amendment, the administrative process is replaced by a medicalized one where a Medical Board (headed by a CMO) must verify the applicant before the DM issues the certificate.
- **STATEMENT 2 IS INCORRECT:** The 2026 Bill specifically removes the provision for "self-perceived gender identity" and moves toward a biological/medical framework, which critics argue contradicts the NALSA judgment.
- **STATEMENT 3 IS CORRECT:** The Bill introduces stringent, graded punishments, including life imprisonment and fines up to Rs 5 lakh for crimes involving the forced identity or exploitation of transgender children.

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2.1. DIEGO GARCIA

Context:

Recently, the United Kingdom and the United States have faced heightened security concerns regarding the **Diego Garcia** military base following reports of unsuccessful missile strikes targeted at the facility amidst escalating regional tensions in the Middle East.

1. **Geographical Location**
   - **Archipelago:** It is the largest landmass in the **Chagos Archipelago**, which consists of 58 individual tropical islands.
   - **Coordinates:** Situated approximately **7° South of the Equator** in the central Indian Ocean.
   - **Proximity:** It lies about 1,800 km southwest of India (Kanyakumari) and roughly 1,200 km south of the Maldives.
   - **Physical Feature:** It is a **horseshoe-shaped coral atoll** with a large, deep natural lagoon that provides excellent anchorage for naval vessels.
2. **Historical Background and Sovereignty Dispute**
   - **Colonial Era:** Originally explored by the Portuguese, the islands were later settled by the French and eventually ceded to the **United Kingdom** under the **Treaty of Paris (1814)**.
   - **Separation from Mauritius:** In 1965, three years before Mauritius gained independence, the UK detached the Chagos Archipelago from Mauritius to create the **British Indian Ocean Territory (BIOT)**.
   - **Expulsion of Inhabitants:** Between 1967 and 1973, the UK forcibly evicted the indigenous **Chagossian population** (also known as Îlois) to Seychelles and Mauritius to facilitate the construction of the US military base.
3. **The 2025 Sovereignty Deal**
   - **Recognition of Sovereignty:** Under the landmark treaty signed in May 2025, the UK acknowledged Mauritius as the sovereign authority over the entire Chagos Archipelago.
   - **Lease Agreement:** A critical caveat of the deal is that **Diego Garcia** remains under the administrative control of the UK for an initial period of **99 years** to ensure the continued operation of the joint military base.
   - **Resettlement:** The treaty allows Mauritius to implement a resettlement program on the "outer islands" of the archipelago, though resettlement on Diego Garcia itself remains restricted due to military requirements.
4. **Strategic and Military Significance**
   - **Power Projection:** Often called an "unsinkable aircraft carrier," the base allows the US to project power across the **Indo-Pacific**, Middle East, and East Africa.

- **Operational History:** It served as a vital launchpad for operations during the **Gulf War (1991)**, the war in **Afghanistan (2001)**, and the **Iraq War (2003)**.
- **Facilities:** It hosts a 3,700-meter runway capable of supporting long-range bombers (like B-52s and B-2 Stealth bombers) and a deep-water port for nuclear-powered submarines and aircraft carriers.

5. International Legal Perspective

- **ICJ Advisory Opinion (2019):** The International Court of Justice ruled that the decolonization of Mauritius was not lawfully completed and that the UK is under an obligation to end its administration of the Chagos Archipelago.
- **UN General Assembly (2019):** Passed a resolution demanding the UK withdraw its colonial administration, affirming the ICJ's stance.
- **ITLOS Ruling (2021):** The International Tribunal for the Law of the Sea also upheld Mauritius' claim to the archipelago.

Q. With reference to the Chagos Archipelago, recently seen in the news, consider the following statements:

1. The archipelago is located to the north of the Equator in the Western Indian Ocean.
2. Under the 2025 agreement, the UK has recognized the sovereignty of Mauritius over Diego Garcia.
3. The indigenous population of the Chagos Islands is primarily of French-Polynesian descent.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 2 only

(c) 1 and 3 only

(d) 1, 2, and 3

Answer: (b) 2 only

Solution:

- **STATEMENT 1 IS INCORRECT:** The Chagos Archipelago is located at approximately **7° South** of the Equator, placing it in the Southern Hemisphere, not north of the Equator. It is situated in the **Central Indian Ocean**.
- **STATEMENT 2 IS CORRECT:** In the May 2025 treaty, the United Kingdom formally recognized the sovereignty of **Mauritius** over the entire Chagos Archipelago, including Diego Garcia, while retaining a 99-year lease for the military base.
- **STATEMENT 3 IS INCORRECT:** The indigenous population, known as the **Chagossians** or Îlois, are primarily of **African and Indian** descent, many being descendants of enslaved workers brought to the islands during French and British colonial rule.

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3.1. AgriPV

Context:

A proposal for a **National Agri-photovoltaics Mission** has been introduced to achieve a target of 10 GW capacity, aiming to resolve the "food vs. energy" land-use conflict as India strives for 300 GW of solar power by 2030.

1. **Understanding Agri-photovoltaics (AgriPV)**

   AgriPV (also known as *Agrisolar* or *Dual-use Solar*) is the simultaneous use of **land for both solar energy generation** and agricultural production.

   Key Technical Features

   - **Elevated Mounting:** Panels are fixed **2–3 meters high** (standard elevation at least 2.1m) to allow movement of laborers and farm machinery (like tractors) beneath them.
   - **Optimal Tilting:** Panels are often tilted at an angle (approx. 30°) or use **manual/automated tracking** to balance light for crops with energy capture.
   - **Bifacial Panels:** Modern systems use panels that capture sunlight from both sides, often installed vertically to save space.

2. **Synergies and Benefits**
   - **Micro-climate Control:** Partial shading reduces **evapotranspiration**, helping soil retain moisture longer (reducing irrigation needs by up to 29%).
   - **Yield Protection:** Protects sensitive crops from heat stress, hail, and extreme weather.
   - **Water Conservation:** Systems can incorporate **rainwater harvesting**, capturing up to 80% of rain falling on panels for irrigation/cleaning.
   - **Economic Stability:** Provides a secondary, stable revenue stream for farmers (lease rent or selling surplus power to the grid).
3. **Institutional & Policy Framework**
   - **PM-KUSUM Scheme:** The primary anchor.
     - **Component A:** Decentralized ground-mounted plants (500 kW to 2 MW) on barren/fertile land.
     - **Component B & C:** Standalone solar pumps and solarization of existing pumps.
   - **Nodal Agencies:** Ministry of New and Renewable Energy (**MNRE**) and the National Solar Energy Federation of India (**NSEFI**).
   - **India Agrivoltaics Alliance (IAA):** An initiative to integrate solar infrastructure with agricultural spaces.

4. **Challenges and Regulatory Barriers**
   - **High CAPEX:** Installation costs are roughly **11% higher** than traditional ground-mounted solar due to specialized elevated structures.
   - **Technical Suitability:** Not all crops are "shade-tolerant." Success depends on matching specific crops (e.g., leafy greens, tomatoes, onions) with panel density.
   - **Policy Gaps:**
     - **Land Use Classification:** Ambiguity in laws regarding whether AgriPV land is "agricultural" or "industrial," affecting tax and subsidies.
     - **Yield Thresholds:** Unlike Japan (which mandates 80% yield maintenance), India lacks standardized minimum agricultural yield thresholds.
   - **Grid Limitations:** Rural areas often face intermittent grid connectivity, hindering the sale of surplus power back to **DISCOMs**.
5. **Global Best Practices for Comparison**
   - **Germany (DIN SPEC 91434):** Requires at least **66% of original yield** to be maintained; only 15% of arable land can be used for infrastructure.
   - **Japan:** Requires specific panel heights and periodic reviews every 3 years to ensure agricultural productivity isn't compromised.
6. **Crops for Agri-photovoltaics (AgriPV) in India**

Crop Category	Suitable Crops	Reason for Suitability
Leafy Vegetables	Spinach (Palak), Lettuce, Fenugreek (Methi)	These are naturally **shade-tolerant** and require less direct intense sunlight to prevent wilting.
Root/Tuber Crops	Potato, Onion, Radish, Ginger, Turmeric	Shading keeps the soil cooler, which is beneficial for the growth of underground bulbs and tubers.
Fruit Vegetables	Tomato, Chilli, Brinjal (Eggplant)	These show resilience under partial shade, though yields must be monitored against light-saturation points.
Fodder Crops	Alfalfa, Napier Grass	High biomass production is possible with reduced water evaporation under panels.
Aromatic/Medicinal	Aloe Vera, Lemongrass, Mint	Many medicinal plants prefer the diffused light and stable micro-climate provided by solar structures.

Consider the following statements regarding Agri-photovoltaics (AgriPV):

1. It involves simultaneous use of land for agriculture and solar energy generation.
2. Solar panels are installed at ground level to maximize energy efficiency.
3. It helps reduce evapotranspiration and conserve soil moisture.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

Answer: B

Explanation:

1. **It involves simultaneous use of land for agriculture and solar energy generation.** This is correct. AgriPV enables the co-location of farming and solar panels on the same piece of land.
2. **Solar panels are installed at ground level to maximize energy efficiency.** This is **incorrect**. In AgriPV, solar panels are usually elevated (2-3 meters or more) above the ground. While ground-mounted systems exist, they are not typically called "AgriPV" if they prohibit agricultural activities, and the goal of elevation is specifically to allow farming underneath.
3. **It helps reduce evapotranspiration and conserve soil moisture.** This is correct. The partial shading provided by solar panels reduces the intensity of direct sunlight, leading to lower evapotranspiration rates and increased water conservation in the soil.

3.2. UDAN

Context:

Recently, the Union Cabinet, chaired by the Prime Minister, approved the **"Modified UDAN" (Ude Desh ka Aam Naagrik)** scheme with a total outlay of **₹28,840 crore** for a period of ten years (FY 2026-27 to FY 2035-36).

1. **Overview of the Scheme**
   - **Nature:** It is a **Regional Connectivity Scheme (RCS)** launched in October 2016 under the **National Civil Aviation Policy (NCAP) 2016**.
   - **Ministry:** It is an initiative of the **Ministry of Civil Aviation (MoCA)**.
   - **Objective:** To facilitate "affordable" air travel for the common man and to develop the regional aviation market by connecting unserved and underserved airports.
   - **Duration:** Originally planned for 10 years; the modified version now extends the vision toward **Viksit Bharat 2047**.
2. **Key Components of "Modified UDAN" (Launched March 2025/26)**
   - **Extended Subsidy:** The government has extended the **Viability Gap Funding (VGF)** support for airlines from the previous 3 years to **5 years** to ensure routes become commercially viable.
   - **Infrastructure Targets:** The scheme proposes to develop **100 airports** from existing unserved airstrips and **200 modern helipads** at an estimated cost of ₹15 crore each.

- **Operation & Maintenance (O&M) Support:** For the first time, the government will provide O&M support for three years to RCS-only aerodromes (capped at ₹3.06 crore per airport annually).
- **Funding Shift:** The subsidy burden is shifting from a levy on trunk routes (Regional Connectivity Fund) to direct **Exchequer-based budgetary support**.
- **Indigenous Push:** The scheme includes the procurement of **HAL Dhruv helicopters** and **HAL Dornier aircraft** to promote *Atmanirbhar Bharat* in the aviation sector.

3. Financial and Operational Mechanism

- **Viability Gap Funding (VGF):** This is a financial grant provided to the Selected Airline Operator (SAO) to bridge the gap between the cost of operations and expected revenues.
- **Fare Caps:** To keep travel affordable, airfares for a fixed number of seats (usually 50% of the capacity) are capped based on flight duration or distance.
- **Concessions by Stakeholders:**
  - **Central Government:** Provides excise duty reduction on Aviation Turbine Fuel (ATF) to 2%.
  - **State Governments:** Provide land free of cost, reduce VAT on ATF to 1% or less, and provide security/fire services.
  - **Airport Operators:** Waive landing, parking, and Terminal Navigation Landing Charges (TNLC).

4. Evolution Phases

- **UDAN 1.0:** Focused on connecting unserved airports with small aircraft.
- **UDAN 2.0:** Introduced helicopter routes for the first time in hilly and remote areas.
- **UDAN 3.0:** Introduced **Tourism routes** and **Seaplanes** (Water Aerodromes).
- **UDAN 4.0:** Enhanced focus on the **North-East Region**, Hilly States, and Islands.
- **UDAN 5.0 Series:** Removed distance caps (600 km limit) and focused on Category-2 (20-80 seats) and Category-3 (>80 seats) aircraft.

Q. With reference to the "Modified UDAN" (Regional Connectivity Scheme) approved in 2026, consider the following statements:

1. The subsidy period for airlines on selected regional routes has been increased from three years to five years.
2. The scheme is now entirely funded through a levy imposed on domestic flights on trunk routes.
3. It includes a provision for Operation and Maintenance (O&M) support for regional aerodromes for a limited period.

Which of the statements given above is/are correct?

A) 1 and 2 only

B) 2 and 3 only

C) 1 and 3 only

D) 1, 2, and 3

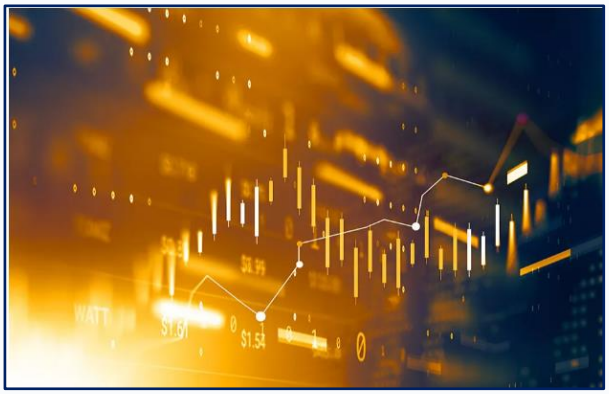
Answer: C

Solution:

- **STATEMENT 1 IS CORRECT:** Under the Modified UDAN scheme, the government has extended the subsidy (VGF) period from 3 years to 5 years to help airlines achieve better sustainability on Tier-2 and Tier-3 routes.
- **STATEMENT 2 IS INCORRECT:** While the original scheme relied heavily on a levy (RCF) on trunk routes, the Modified UDAN involves a significant shift toward **direct funding from the exchequer** (budgetary support) to meet the expanded ₹28,840 crore outlay.
- **STATEMENT 3 IS CORRECT:** The revamped scheme introduces O&M support for approximately 441 aerodromes for an initial period of three years to address high recurring costs at low-traffic airports.

3.3. VOLATILITY IN GOLD PRICES

Context:



Gold, traditionally viewed as a "safe haven" during times of geopolitical and economic crisis, has recently experienced a significant price correction. In India, 24-carat gold, which was trading close to ₹1.9 lakh per 10 grams in late January, has dropped to around ₹1.3 lakh per 10 grams.

1. **Why are Investors Selling Gold?**
    - **Interest Rate Expectations**: When central banks (like the U.S. Federal Reserve) signal higher interest rates for longer periods, gold becomes less attractive because it is **a non-interest-bearing asset.**
    - **Rising Bond Yields**: Higher yields on government bonds offer investors a steady income, prompting them to move capital away from gold into debt instruments.
    - **The Dollar Factor**: Since gold is priced in U.S. dollars globally, a strengthening dollar makes gold more expensive for holders of other currencies, thereby dampening demand and pushing prices down.
        - When the dollar strengthens, global investors with other currencies must pay more to acquire the same amount of gold, which can dampen international demand.
    - **Liquidity Crunch**: During stock market sell-offs, investors often sell their gold holdings to meet margin calls or cover losses in other asset classes, creating downward pressure on gold prices.
2. **Gold as a "Safe Haven" Asset**
    - **Crisis Hedge**: Historically, gold prices surge during military conflicts, financial crises, or periods of high inflation as investors seek to preserve wealth.
    - **Central Bank Reserves**: Central banks are among the largest and most consistent buyers of gold. Following the Russia-Ukraine war and the freezing of Russian foreign assets, many nations have pivoted toward gold to diversify their reserves.

- **Gold ETFs**: Exchange-Traded Funds (ETFs) allow investors to gain exposure to gold prices without holding physical bullion. In India, gold ETF inflows have remained positive even during price corrections.

3. **Impact on India**
   - Key Aspects of Gold Import in India: Switzerland remains the largest source, accounting for nearly 40% of imports, followed by the UAE and South Africa.
   - Positive Effects: Lower gold prices reduce import costs, Helps improve Current Account Deficit (CAD).
   - Negative Effects: Jewellery sector may face price volatility, Traders may incur losses in short term
4. **Global and National Gold Geography**

Top Gold Producers in the World

- China, Russia, and Australia are the world's top gold producers, collectively contributing over 30% of global output as of 2022-2024, with China consistently ranking first. Other major producers include Canada, the U.S., Ghana, and Uzbekistan.

Gold reserve and Key Gold Mines in India

- **India's Gold Reserves:** 8th largest official gold reserve in the world. Gold accounts for roughly 17% of India's total foreign exchange reserves.
- **Hutti Gold Mine (Karnataka)**: Located in the Raichur district, it is currently the only functional commercial gold mine in India.
- **Kolar Gold Fields (Karnataka)**: Historically one of the deepest and most productive mines in the world; currently closed for commercial operations.
- **Ramgiri Gold Fields (Andhra Pradesh)**: Another significant historical site for gold exploration.
- **Sonbhadra (Uttar Pradesh)**: Recently in the news for potential large-scale gold deposits discovered by the Geological Survey of India (GSI).

Major Global Gold Mines

- **Witwatersrand Basin (South Africa)**: Historically the world's largest gold-producing region.
- **Muruntau Mine (Uzbekistan)**: One of the world's largest open-pit gold mines by production.
- **Grasberg Mine (Indonesia)**: A massive complex known for both gold and copper extraction.

World Gold Council

- The World Gold Council was formed in 1987 by some of the world's most forward-thinking mining companies.
- **Headquartered in London,** the WGC covers the markets which comprise about three-quarters of the world's annual gold consumption.

Q. With reference to gold prices, consider the following statements:

1. Gold becomes less attractive when interest rates rise.
2. Gold provides regular interest income to investors.
3. Rising bond yields can reduce demand for gold.

Which of the statements given above is/are correct?

(a) 1 and 3 only
(b) 2 and 3 only
(c) 1 only
(d)1, 2 and 3

Answer: A

Statement 1 is correct: Gold is a non-interest-bearing asset. When central banks raise interest rates, the opportunity cost of holding gold increases, making it less attractive compared to interest-yielding investments.

Statement 2 is incorrect: Unlike stocks (dividends) or bonds (interest), gold does not provide any regular interest or passive income to investors. Its value is primarily driven by price appreciation.

Statement 3 is correct: Rising bond yields offer investors a steady and often safer return on their capital. As yields go up, investors frequently shift their money from gold into bonds, which reduces the overall demand for gold.

3.4. INDIAN COFFEE EXPORTS

Context:

The escalating conflict between the **U.S./Israel and Iran** has severely constrained maritime passage through the **Strait of Hormuz**. This has led to the stranding of approximately 300 coffee containers (6,000 tonnes), resulting in massive cost escalations and logistical delays for Indian exporters targeting West Asian and European markets.

1. **Logistics and Trade Disruptions**
   - **Freight Cost Escalation:** Delivery costs per container have risen by **$5,000 to $6,000**, on top of standard freight charges ($800–$1,000).
   - **War Surcharges:** Exporters are facing additional "war surcharges" and insurance costs.
   - **Stranded Consignments:** Shipments are being offloaded at "safe-labeled" ports far from destinations, such as:
     - **Khor Fakkan** (UAE)
     - **Sohar** or **Salalah** (Oman)
     - **Jeddah** (Saudi Arabia)

2. **Geographical Significance: The Strait of Hormuz**
    - **Location:** Connects the **Persian Gulf** with the **Gulf of Oman** and the **Arabian Sea**.
    - **Chokepoint:** It is one of the world's most strategically important chokepoints. Any disruption here impacts India's trade with **Jebel Ali Port (Dubai)**, a primary hub for Indian coffee distribution.
3. **Impact on the Coffee Industry**
    - **Market Share: Europe (Italy, Germany, Belgium)** is the largest importer of Indian coffee, accounting for a **60% share**.
    - **Competitor Advantage:** India's inability to reach markets in time has opened opportunities for rival producers like **Uganda, Costa Rica, Ethiopia, and Brazil**.
    - **Karnataka's Role:** Over **70% of India's coffee** is produced in Karnataka (Planters from Chikkamagaluru).
4. **Institutional Stakeholders**
    - **AICAEA:** Coffee Exporters Association of India.
    - **Coffee Board of India:** Statutory organization under the **Ministry of Commerce and Industry**. H.Q- Bengaluru
5. **Global Scenario**
    - **Origin**: Coffee originated in the ancient coffee forests of the Ethiopian plateau.
    - **Regional Share:** South America is the largest producer (~41%), followed by Southeast Asia (~27%), and Africa (~17%).
    - **Country wise:** Brazil > Vietnam > Colombia > Indonesia.
    - India is now one of the world's leading coffee producers, ranking as the **seventh-largest producer of coffee** (2025-26) and contributing about 3.5 percent to global coffee production.
    - India has emerged as a significant player in the global coffee trade, ranking as the **fifth-largest exporter** of coffee among coffee-producing nations.
6. **Indian Scenario**
    - Legend has it that India's coffee journey began around 1600 AD when Sufi Saint **Baba Budan** planted seven coffee seeds brought from Mocha port in Yemen in the Baba Budan Giri hills of **Chikkamangaluru, Karnataka.**
    - The coffee industry in India is primarily concentrated in the major coffee-growing states of **Karnataka, Kerala, and Tamil Nadu**, which collectively account for nearly 96 percent of the country's total coffee production.
    - Among these, **Karnataka leads with a production** of 2,80,275 metric tonnes (Post Blossom Estimate for 2025–26), followed by Kerala and Tamil Nadu.
    - India's coffee cultivation is spread across **13 agro-climatic zones**, grouped into three categories:
        - **Traditional regions:** Karnataka, Kerala, Tamil Nadu
        - **Non-traditional regions:** Andhra Pradesh, Odisha

- **North Eastern regions:** Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura.

7. Key Requirements

Parameter	Requirement Details	Key Points
Climate	**Tropical & Humid**	Requires a hot and moist climate; sensitive to extreme weather.
Temperature	**15°C to 28°C**	High day temperatures (above 30°C) and frost are both harmful.
Rainfall	**150 cm to 250 cm**	Must be well-distributed. Needs **"Blossom Showers"** (March-April).
Soil Type	**Deep, Well-drained Loamy Soil**	Rich in **Humus** and organic matter; slightly acidic (pH 5.0–6.5).
Topography	**Hilly Slopes (600m - 1600m)**	Requires slopes to prevent **waterlogging**, which causes root rot.
Sunlight	**Partial Shade**	Often inter-cropped with shade trees (Silver Oak) to avoid direct sun.
Labor	**Highly Intensive**	Picking, drying, and grading are done manually; high female labor ratio.

Q. Which of the following states belong to the traditional coffee-growing regions of India?

1. Karnataka
2. Kerala
3. Tamil Nadu
4. Odisha

Select the correct answer:

A. 1, 2 and 3 only
B. 1 and 2 only
C. 2, 3 and 4 only
D. All of the above

Answer: A

Explanation:

1. Traditional Regions

These are the core areas in South India where coffee has been grown for centuries, primarily along the **Western Ghats**.

- **Karnataka:** The powerhouse of Indian coffee, accounting for over **70%** of total production. Major districts include Kodagu (Coorg), Chikkamagaluru, and Hassan.
- **Kerala:** The second-largest producer, famous for its **Wayanad Robusta**.

- **Tamil Nadu:** Known for high-altitude plantations in the **Nilgiris**, Shevaroy Hills, and Pulney Hills.

2. Non-Traditional (Expansion) Regions

These areas were introduced to coffee cultivation much later to diversify the crop base and provide livelihoods to tribal communities.

- **Andhra Pradesh:** Specifically the **Araku Valley**, which has gained international fame for its organic Arabica.
- **Odisha:** Regions like Koraput are developing as coffee hubs.

3. North-Eastern Region

This includes the "Seven Sister" states (Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Arunachal Pradesh). While coffee is grown here, it is classified separately from the "Traditional" South Indian belt.

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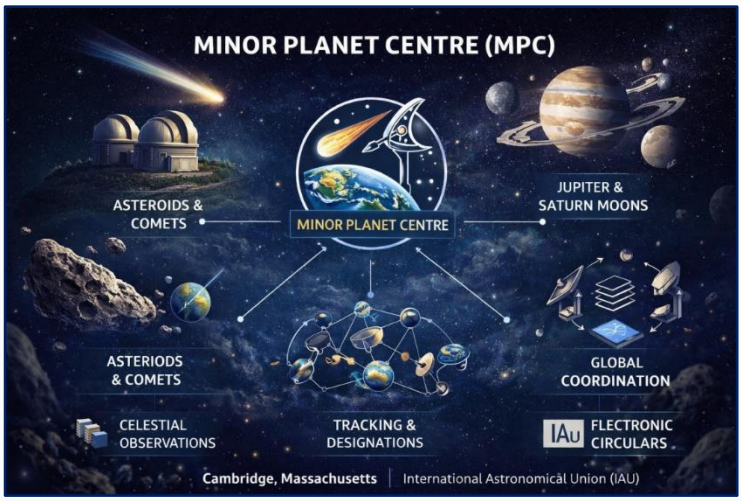
4.1. DISCOVERY OF 15 NEW MOONS

Context:

The Minor Planet Centre (MPC) recently announced the discovery of **15 new moons**: 4 orbiting **Jupiter** and 11 orbiting **Saturn**.



1. **The Minor Planet Centre (MPC)**
   - **Primary Role:** It serves as the world's single repository for all observations of **small bodies** in the solar system, including asteroids, comets, and the moons of outer planets.
   - **Location & Operation:** Located in Cambridge, Massachusetts, it operates at the **Smithsonian Astrophysical Observatory**.
   - **Institutional Affiliation:** It functions under the auspices of the **International Astronomical Union (IAU)**.
   - **Designation Process:** When a new object is discovered, the MPC verifies the observation, calculates the orbit, and assigns an **official designation** to ensure every minor planet has a unique identity.
2. **Near-Earth Objects (NEOs) & Planetary Defense**
   - **Monitoring:** One of the MPC's most critical tasks is tracking **Near-Earth Objects (NEOs)**—space rocks that could potentially threaten Earth.
   - **Collaboration:** It maintains a massive database with support from **NASA's Planetary Defense Coordination Office**.
   - **Predictive Science:** The data allows scientists to predict if and when a celestial rock might come dangerously close to our planet.
3. **Global Coordination**
   - **Communication:** The MPC facilitates global scientific communication by publishing **electronic circulars**.
   - **Alert System:** These circulars alert researchers to new discoveries or interesting celestial events, allowing observatories worldwide to coordinate efforts quickly.

Q. Consider the following statements regarding the Minor Planet Centre:

1. It is the global repository for observations of small solar system bodies.
2. It operates under NASA.
3. It assigns official designations to newly discovered celestial objects.

Which of the statements given above is/are correct?
(a) 1 and 3 only
(b) 2 and 3 only
(c) 1 only
(d) 1, 2 and 3
Answer: A
Explanation:

- **Statement 1 is correct:** The Minor Planet Centre (MPC) is the single worldwide location for all observations and data related to **small bodies** in the solar system, such as asteroids, comets, and natural satellites of the outer planets.
- **Statement 2 is incorrect:** While the MPC receives support from NASA (specifically through the Planetary Defense Coordination Office), it officially operates at the **Smithsonian Astrophysical Observatory** under the auspices of the **International Astronomical Union (IAU)**. It is not a direct sub-agency of NASA.
- **Statement 3 is correct:** One of the core functional roles of the MPC is to verify observations, calculate orbits, and assign **official designations** (identities) to newly discovered minor planets and other celestial objects.

4.2. CAUVERY BASIN

Context:

A new study published in the journal *Earth's Future* by researchers at **IIT Gandhinagar** warns that while global warming is expected to increase flow in most major Indian rivers, the **Cauvery Basin** is an exception and will likely face a significant dry spell until 2050.

1. **Key Findings of the Study**
   - **Near-Term Decline:** The basin faces a potential water decline of approximately **3.5%** between 2026 and 2050.
   - **Long-Term Projection:** Water levels are expected to rise only "negligibly" after 2051.
   - **Historical Data:** Between 1951 and 2012, the Cauvery already experienced a **28% decline** in streamflow.
   - **Contradictory Impact:** Unlike northern rivers that may flood due to increased rainfall from warming, the Cauvery is unlikely to benefit from global warming-induced rain.
2. **Potential Solutions**
   - **River Interlinking:** Projects like the proposed **Godavari-Cauvery link** could be necessary to mitigate the shortage.
   - **Statistical Modeling:** The study used a novel "constrained modelling" approach to reduce errors often found in general climate models applied to Indian rainfall.

3. About the Cauvery Basin

A. The Cauvery River Profile

- **Origin:** Rises at **Talakaveri** in the Brahmagiri Range of the Western Ghats (Kodagu district, Karnataka).
- **Tributaries:**
  - **Left Bank:** Hemavati, Shimsha, Arkavati.
  - **Right Bank:** Lakshmana Tirtha, Kabbani, Suvarnavati, Bhavani, Amaravati.
- **Drainage:** Cauvery is an easterly flowing river of the Peninsular India that runs across three of the southern Indian states i.e. **Karnataka, Tamil Nadu, Kerala** and a Union Territory of **Puducherry.**
- **Major Projects:** Krishnaraja sagar dam (Karnataka) , Mettur (Tamil Nadu) and Grand Anicut projects.
- **Important Cities on the Bank of Cauvery River:** Mysore, Mandya, and Kushalnagar in Karnataka, along with Erode, Tiruchirappalli (Trichy), Kumbakonam – Temple town, Thanjavur – Chola capital region and Mayiladuthurai in Tamil Nadu.
- **Important temples on the banks of the Cauvery River:** Ranganathaswamy Temple (Srirangam), Brihadishvara Temple (Thanjavur), and the Adikumbheshvara temple**.**
- **Famous waterfalls on the Cauvery River:**
- **Shivanasamudra Falls**
  - One of the most famous waterfalls on the Cauvery
  - Divided into Gaganachukki and Bharachukki falls
  - Among the earliest sites of hydroelectric power generation in India
- **Hogenakkal Falls**
  - Known as the “Niagara of India”
  - Famous for coracle boat rides and scenic beauty
  - Located on the Karnataka–Tamil Nadu border
- **Key Wildlife Sanctuaries & National Parks on the bank of Cauvery River:**
  - Cauvery Wildlife Sanctuary, Ranganathittu Bird Sanctuary, Nagarahole National Park, and Sathyamangalam Tiger Reserve

B. Inter-State Water Disputes

- The Cauvery has a "fraught history" of water sharing between Karnataka and Tamil Nadu.
- Article 262 of the Constitution and the **Inter-State River Water Disputes Act, 1956**, govern these conflicts.

C. Climate Change & Hydrology

- **Hydrological Drought:** This study points toward a long-term hydrological drought in the basin despite overall national rainfall increases.
- **Environmental Impact:** Decline in flow affects the **Kaveri Delta** (the "Rice Bowl of South India"), groundwater recharge, and local biodiversity.

Q. Which of the following protected areas lie in the Cauvery Basin?

1. Cauvery Wildlife Sanctuary
2. Ranganathittu Bird Sanctuary
3. Nagarhole National Park
4. Sathyamangalam Tiger Reserve

Select the correct answer:

A. 1 and 2 only
B. 1, 2 and 3 only
C. 1, 2, 3 and 4
D. 2 and 4 only

Answer: C

Explanation:

All the mentioned protected areas are situated within or are hydrologically linked to the **Cauvery River Basin**:

1. **Cauvery Wildlife Sanctuary:** Located in the Mandya, Ramanagara, and Chamarajanagar districts of Karnataka, the Cauvery River flows directly through this sanctuary, making it the most central protected area to the river's ecosystem.
2. **Ranganathittu Bird Sanctuary:** This consists of six small islands on the banks of the Cauvery River in Karnataka. It is a critical nesting ground for water birds that depend entirely on the river's flow.
3. **Nagarhole National Park:** Also known as Rajiv Gandhi National Park, its southern boundary is defined by the **Kabini Reservoir**, which is formed by the Kabini River—one of the largest and most important tributaries of the Cauvery.
4. **Sathyamangalam Tiger Reserve:** Situated at the confluence of the Western and Eastern Ghats in Tamil Nadu, its northern boundary is marked by the Cauvery River after it descends from the Karnataka plateau.

4.3. MICROPLASTICS

Context:

Recently, a high-level study has raised fresh alarms regarding the pervasive nature of **microplastics**, revealing their presence in nearly all Indian brands of **salt and sugar**, irrespective of whether they are packaged, loose, or organic. This development coincides with the ongoing international deliberations for a **Global Plastics Treaty (2026)**, where negotiators are debating the inclusion of specific mandates to cap primary plastic production to curb the generation of these microscopic pollutants at the source.

1. **Definition and Classification**

   Microplastics are defined as solid plastic particles or synthetic polymer matrices that are insoluble in water and have a size ranging from **1 micrometer to 5 millimeters**.

   - **Nanoplastics:** These are even smaller particles, typically defined as being less than **100 nanometres** in size. Due to their minute size, they can cross biological barriers (like the blood-brain barrier).

2. **Primary vs. Secondary Microplastics**

   - **Primary Microplastics:** Intentionally manufactured small particles.
     Examples: **Microbeads** in exfoliating soaps/cosmetics, plastic pellets (nurdles) used in industrial manufacturing, and synthetic fibers from clothing.
   - **Secondary Microplastics:** Formed from the **fragmentation** of larger plastic items (bottles, bags, fishing nets) through weathering processes like **UV radiation**, mechanical erosion (waves), and chemical degradation.

3. **Impact on Health and Environment**

   - **Biomagnification:** Microplastics enter the food chain via ingestion by marine organisms (plankton, fish) and increase in concentration as they move up to higher trophic levels, eventually reaching humans.
   - **Human Health:** Studies have detected microplastics in human **blood, lungs, placenta, and breast milk**. They can cause oxidative stress, inflammation, and potential DNA damage.
   - **Environmental Persistence:** They are **non-biodegradable** and can persist in the environment for hundreds of years. They also act as "sponges" for **Persistent Organic Pollutants (POPs)** and heavy metals, making them toxic carriers.

4. **Global and National Initiatives**

   - **Global Plastics Treaty:** A UN-led initiative (Intergovernmental Negotiating Committee) aiming for a legally binding international agreement by 2026 to end plastic pollution.
   - **Plastic Waste Management (Amendment) Rules, 2021 (India):** Prohibited identified **Single-Use Plastic (SUP)** items and increased the thickness of plastic carry bags.
   - **Extended Producer Responsibility (EPR):** Mandates producers, importers, and brand owners to ensure the processing of plastic packaging waste.
   - **UNEP's 'Clean Seas' Campaign:** A global movement to tackle marine litter and plastic pollution.

5. **Detection Technologies**

   Recent studies utilize **Raman Spectroscopy** and **Hyperspectral Imaging** to identify the chemical signature of polymers at a microscopic level. Raman scattering allows scientists to differentiate between different types of plastics based on their molecular vibrations.

Q. With reference to Microplastics, consider the following statements:

1. Primary microplastics are those that result from the fragmentation of larger plastic objects like water bottles and fishing nets.
2. Nano plastics are generally defined as particles having a size smaller than 1 micrometer.

3. Microplastics have the capacity to absorb Persistent Organic Pollutants (POPs) from the surrounding environment.
4. India has currently implemented a complete ban on the manufacture of all types of primary microplastics.

How many of the statements given above are correct?

A. Only one

B. Only two

C. Only three

D. All four

Correct Answer: B (Only two)

- **STATEMENT 1 INCORRECT:** Fragmentation results in **Secondary** microplastics. Primary microplastics are intentionally manufactured (e.g., microbeads).
- **STATEMENT 2 CORRECT:** Nanoplastics are indeed smaller than 1 Micrometer.
- **STATEMENT 3 CORRECT:** Due to their hydrophobic nature, microplastics can adsorb and carry toxic chemicals like POPs.
- **STATEMENT 4 INCORRECT:** While India has banned certain Single-Use Plastics and regulated microbeads in specific cosmetic products, there is **no complete ban** on "all types" of primary microplastics used in industrial processes (like nurdles).

4.4. NEW BUTTERFLY SPECIES

Context:

Recently, a new species of butterfly has been discovered in the semi-evergreen forests of the **Lepa Rada district** in central **Arunachal Pradesh**. Scientific researchers have christened this new-to-science species as ***Euthalia zubeengargi***, giving it the common name **'Basar Duke'**.

1. **Basar Duke (*Euthalia zubeengargi*)**
   - **Discovery Site:** Found in the **Basar region** of Lepa Rada district, Arunachal Pradesh.
   - **Naming:** It is named after the iconic Assamese singer **Zubeen Garg** as a tribute to his cultural influence in the Northeast.
   - **Physical Features:** It belongs to the genus *Euthalia* (commonly known as Dukes and Barons). It is characterized by **olive-brown wings** with distinct white markings and a unique **turquoise-green** underside.
   - **Habitat:** It prefers the shaded understory of humid, semi-evergreen forests at elevations between **600–750 metres**.
   - **Rarity:** Researchers have documented only a few individuals, suggesting the species is highly localized and potentially rare.

2. **Kaiser-i-Hind**
    - **Status:** Declared the **State Butterfly of Arunachal Pradesh** in 2021.
    - **Meaning:** The name literally translates to **"Emperor of India."**
    - **Conservation Status:**
        - **IUCN:** Near Threatened.
        - **Wildlife Protection Act, 1972:** Schedule II.
        - **CITES:** Appendix II.
    - **Habitat:** High-altitude temperate evergreen forests (6,000–10,000 ft). Its presence is considered an indicator of a **healthy forest ecosystem**.
3. **Conservation and Ecological Significance**
    - **Indicator Species:** Butterflies serve as excellent **bio-indicators**; their presence or absence reflects the health of the local micro-climate and vegetation.
    - **Pollination:** They play a crucial role as pollinators for various Himalayan flora.
    - **Legal Protection:** Many of these rare species are protected under the **Wildlife (Protection) Act, 1972**, to prevent illegal trade by collectors.

Q. With reference to the 'Basar Duke', recently seen in the news, consider the following statements:

1. It is a newly discovered butterfly species endemic to the Western Ghats.
2. It has been named after a famous Indian cultural icon from Northeast India.
3. It belongs to a genus of butterflies that are typically found in high-altitude alpine meadows.

Which of the statements given above is/are correct?

(a) Only one

(b) Only two

(c) All three

(d) None

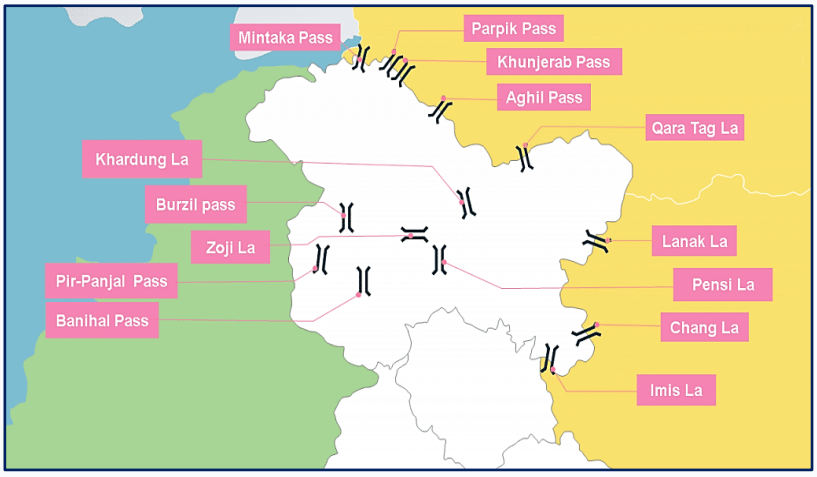
Solution: (a) Only one

- **STATEMENT 1 INCORRECT:** The Basar Duke (*Euthalia zubeengargi*) was discovered in **Arunachal Pradesh** (Eastern Himalayas), not the Western Ghats.
- **STATEMENT 2 CORRECT:** The species is named after **Zubeen Garg**, a legendary singer and cultural icon from Assam.
- **STATEMENT 3 INCORRECT:** It belongs to the genus *Euthalia*, which typically inhabits **shaded understories of semi-evergreen and moist forests**, rather than high-altitude alpine meadows.

4.5. IMPORTANT MOUNTAIN PASSES IN J&K AND LADAKH

Context:

Recently, the strategic **Zojila Pass**, which serves as the critical "gateway" between the Union Territories of **Jammu and Kashmir** and **Ladakh**, has been in the news due to a tragic avalanche near **Zero Point** on the Srinagar-Leh National Highway (NH-1).



Zojila Pass: Key Facts for Prelims

- **Location:** Situated at an altitude of approximately **3,528 metres (11,575 feet)** in the **Zanskar Range** of the Western Himalayas.
- **Connectivity:** It connects **Srinagar** in the Kashmir Valley with **Drass** and **Kargil**, ultimately leading to **Leh** in Ladakh.
- **Historical Significance:** It was a major battleground during the **Indo-Pakistani War of 1947-48**; the Indian Army's **Operation Bison** successfully recaptured the pass using tanks at high altitude—a historic military feat.
- **National Highway:** It is a vital segment of **NH-1** (formerly NH-1D).

The Zojila Tunnel Project

- **Objective:** To provide **all-weather connectivity** between Srinagar and Leh, which is currently severed during winter due to heavy snowfall and avalanches.
- **Specifications:** Once completed, it will be approximately **14.15 km long**, making it **Asia's longest bi-directional tunnel** at such a high altitude.
- **Technology:** The tunnel uses the **New Austrian Tunnelling Method (NATM)** and features advanced "Smart Tunnel" safety systems.
- **Strategic Impact:** It will reduce the travel time across the pass from **3.5 hours to just 15 minutes**, ensuring seamless logistics for the Indian Armed Forces near the **Line of Actual Control (LAC)**.

Other Important Mountain Passes in J&K and Ladakh

Pass Name	Range / Location	Significance
Banihal Pass	Pir Panjal Range	Connects Jammu with the Kashmir Valley; the **Jawahar Tunnel** and **Banihal-Qazigund Tunnel** operate here.
Pir Panjal Pass	Pir Panjal Range	Known as *Peer Ki Gali*, it connects the Kashmir Valley to Rajouri and Poonch via the Mughal Road.
Khardung La	Ladakh Range	One of the world's highest motorable roads; gateway to the **Shyok and Nubra Valleys** and the **Siachen Glacier**.

Pensi La	Zanskar Range	Known as the "Gateway to Zanskar," it connects the Suru Valley (Kargil) to the Zanskar Valley.
Fotu La	Zanskar Range	The highest point on the Srinagar-Leh highway, providing a critical link between the two regions.
Chang La	Ladakh Range	High altitude pass on the route from Leh to the **Pangong Tso** lake.
Karakoram Pass	Karakoram Range	Located on the border between India (Ladakh) and China (Xinjiang); part of the ancient **Silk Route**.
Umling La	Ladakh	Currently holds the record for the **world's highest motorable road** at an altitude of over 19,000 feet.

Q. Consider the following pairs of Mountain Passes and the regions they connect:

1. **Zojila Pass:** Srinagar and Leh
2. **Banihal Pass:** Jammu and Srinagar
3. **Pensi La:** Kashmir Valley and Gurez Valley
4. **Khardung La:** Leh and Nubra Valley

How many of the above pairs are correctly matched?

(a) Only one pair

(b) Only two pairs

(c) Only three pairs

(d) All four pairs

Solution: (c) Only three pairs

- **STATEMENT 1 CORRECT:** Zojila Pass is the primary link on NH-1 connecting Srinagar to Drass, Kargil, and Leh.
- **STATEMENT 2 CORRECT:** Banihal Pass in the Pir Panjal range is the traditional gateway between the Jammu region and the Kashmir Valley.
- **STATEMENT 3 INCORRECT: Pensi La** connects the Suru Valley (Kargil) with the Zanskar Valley. The **Razdan Pass** is the one that connects the Kashmir Valley with the Gurez Valley.
- **STATEMENT 4 CORRECT:** Khardung La is a vital pass in the Ladakh range that provides motorable access from Leh to the Shyok and Nubra Valleys.

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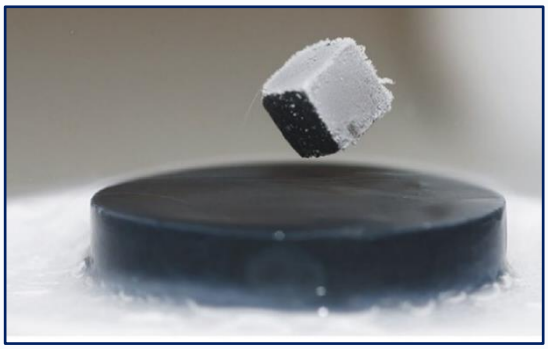
5.1. DISCOVERY OF ROOM-TEMPERATURE SUPERCONDUCTIVITY

Context:



Scientists have reportedly discovered a new material—a **lutetium-hydride compound doped with nitrogen**—that exhibits superconductivity at **room temperature (21°C)**, though it still requires high pressure (10 kilobars) to function. This discovery aims to overcome the "**temperature barrier**" that has historically limited the use of superconductors to extreme laboratory conditions.

1. **What is a Superconductor?**

   A superconductor is a material that can conduct electricity or transport electrons from one atom to another with **zero resistance**.

   - **Critical Temperature:** The specific temperature below which a material becomes superconducting.
   - **Energy Efficiency:** Because there is no resistance, no energy is released as heat, making the transmission of electricity 100% efficient.

2. **Key Physical Properties**

   - **The Meissner Effect:** This is the hallmark of superconductivity. When a material transitions to a superconducting state, it **expels all internal magnetic fields**. This allows for **quantum levitation** or magnetic levitation (Maglev).
     - This is the most important and defining property of superconductivity. When a material is cooled below a certain **critical temperature**, it enters the superconducting state and completely expels all internal magnetic fields. As a result, the material behaves as a perfect **diamagnet**.
     - In this process, magnetic field lines cannot penetrate the material and are forced to move around its surface. This leads to the phenomenon where the material can float above a magnet—known as **quantum levitation or magnetic levitation (Maglev)**.
     - In real-world applications, this effect is used in **Maglev trains**, enabling frictionless motion and very high speeds. It also plays a significant role in modern physics and advanced technologies.
   - **Infinite Conductivity:** Current flowing through a closed loop of superconducting wire can persist indefinitely without a power source.
   - **Exclusion of Magnetic Flux:** Superconductors are perfect diamagnets.

3. **Materials**

   - Superconductivity is one of nature's most intriguing quantum phenomena. It was discovered more than 100 years ago in mercury cooled to the temperature of liquid helium (about -452°F, only a few degrees above absolute zero).

- Following the discovery of superconductivity in mercury, the phenomenon was also observed in other materials at very low temperatures..
- Superconductor material classes include **chemical elements** (e.g. mercury or lead), **alloys** (such as niobium–titanium, germanium–niobium, and niobium nitride), **ceramics** (YBCO and magnesium diboride), **superconducting pnictides** (like fluorine-doped LaOFeAs), single-layer materials such as **graphene and transition metal** dichalcogenides,[48] or **organic superconductors** (fullerenes and carbon nanotubes; though perhaps these examples should be included among the chemical elements, as they are composed entirely of carbon).

4. Applications

- **Medical Imaging**: Used in MRI (Magnetic Resonance Imaging) machines to create the powerful magnetic fields required for high-resolution body scans.
- **Transportation:** Maglev Trains use the Meissner effect for friction-less travel, reaching speeds of over 600 km/h.
- **Particle Accelerators:** Essential for the Large Hadron Collider (LHC) at CERN to steer subatomic particles.
- **Power Grids:** Superconducting cables could transmit power over long distances with zero line loss, solving the global energy wastage problem.
- **Quantum Computing:** Superconducting circuits act as "Qubits," the basic unit of information in quantum computers.

Q. With reference to superconductors, consider the following statements:

1. They conduct electricity with zero resistance.
2. They release heat during current flow.
3. They require a critical temperature to exhibit superconductivity.

Which of the statements given above is/are correct?

(a) 1 and 3 only

(b) 2 only

(c) 1, 2 and 3

(d) 1 only

Answer: A

Explanation:

Statement 1 is correct: Superconductors are materials that can conduct electricity or transport electrons from one atom to another with **zero resistance**.

Statement 2 is incorrect: Because there is no resistance, **no energy is released as heat** during the flow of current. This characteristic makes the transmission of electricity 100% efficient.

Statement 3 is correct: Materials only exhibit superconductivity below a specific temperature known as the **Critical Temperature**

5.2. BIO-PHARMA SHAKTI

Context:

Recently, the Union Finance Minister, during the presentation of the **Union Budget 2026-27**, announced the launch of the **Biopharma SHAKTI** initiative to transform India into a global manufacturing hub for biopharmaceuticals. This move comes as a strategic response to India's shifting disease profile, where non-communicable diseases (NCDs) like cancer and diabetes now account for a significant portion of the national health burden.

1. **What is Biopharma SHAKTI?**

   The **Biopharma SHAKTI** (Strategy for Healthcare Advancement through Knowledge, Technology and Innovation) is a flagship national initiative designed to bolster the domestic ecosystem for high-value biopharmaceutical products.

2. **Key Features and Financial Outlay**

   - **Budgetary Allocation:** The government has proposed a total outlay of **₹10,000 crore** over a period of **five years**.
   - **Targeted Goal:** The initiative aims to capture **5% of the global biopharmaceutical market share**, transitioning India from a "pharmacy of the world" (volume-based) to a global innovation hub (value-based).
   - **Nodal Ministry:** It is steered by the **Department of Pharmaceuticals** under the Ministry of Chemicals and Fertilizers.

3. **Strategic Focus: Biologics and Biosimilars**

   The scheme prioritizes the domestic production of complex medical products:

   - **Biologics:** These are medicines derived from living organisms (cells, tissues, or microorganisms) rather than chemical synthesis. Examples include vaccines, gene therapies, and monoclonal antibodies.
   - **Biosimilars:** These are "highly similar" versions of already approved biological medicines. They provide cost-effective alternatives to expensive branded biologics once patents expire.

4. **Institutional and Infrastructure Strengthening**

   - **NIPER Network:** The plan includes the establishment of **three new National Institutes of Pharmaceutical Education and Research (NIPERs)** and the upgradation of seven existing ones to create a specialized workforce.
   - **Clinical Trial Ecosystem:** The government intends to develop a network of over **1,000 accredited clinical trial sites** across India to facilitate faster and ethical human trials.
   - **Regulatory Reform:** The **Central Drugs Standard Control Organisation (CDSCO)** will be strengthened with a dedicated **Scientific Review Cadre** and specialists to align Indian approval timelines with global standards.

5. Innovation and Startup Support

The initiative focuses on providing **early-stage innovation funding** and structured equity support to help startups move from "concept to commercialization."

- It seeks to foster collaboration between academia, research institutions, and the private industry to reduce the gestation period for new drug development.

Q. With reference to the 'Biopharma SHAKTI' initiative, recently seen in the news, consider the following statements:

1. It aims to develop India as a global manufacturing hub specifically for traditional Ayurvedic medicines and herbal formulations.
2. The initiative proposes the establishment of a dedicated "Scientific Review Cadre" within the Central Drugs Standard Control Organisation (CDSCO).
3. It has a total financial outlay of ₹10,000 crore spread over a period of ten years.

Which of the statements given above is/are correct?

A) 1 and 2 only
B) 2 only
C) 2 and 3 only
D) 1, 2 and 3

Answer: B

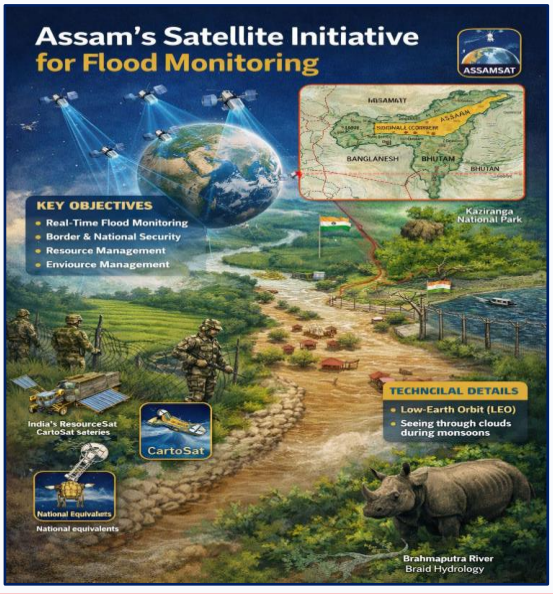
Solution:

- **STATEMENT 1 INCORRECT:** While the budget supports AYUSH, Biopharma SHAKTI specifically focuses on **biologics and biosimilars** (medicines from living organisms), not traditional Ayurvedic formulations.
- **STATEMENT 2 CORRECT:** To meet global standards and speed up approvals, the scheme proposes a **Scientific Review Cadre** and specialists within the **CDSCO**.
- **STATEMENT 3 INCORRECT:** The financial outlay of **₹10,000 crore** is for a period of **five years**, not ten years.

5.3. ASSAM'S SATELLITE INITIATIVE FOR FLOOD MONITORING

Context:

In a **first-of-its-kind** initiative by any Indian state, the Government of Assam has floated a tender to launch a constellation of **Earth-Observation (EO) Satellites**, named **AssamSAT**. This project aims to provide high-resolution, real-time data to tackle the state's chronic flood issues and enhance border security.



1. Key Objectives of the Project

- **Real-Time Flood Monitoring:** Tracking the Brahmaputra River's course and inundation levels during monsoons to improve disaster response.

- **Border & National Security:** Monitoring the **Siliguri Corridor** (Chicken's Neck) and porous international borders where traditional fencing is difficult.
- **Environmental Protection:** Detecting illegal logging, tracking drug trafficking routes, and preventing rhino poaching in **Kaziranga National Park**.
- **Resource Management:** Assessing crop health, forest cover, and urban planning across the state.

2. Technical Framework

- **Orbit:** The satellites will operate in **Low-Earth Orbit (LEO)**.
- **Constellation:** A network of at least **5 satellites** to ensure a high "revisit rate" (how often a satellite passes over the same spot).
- **Satellite Type:** Small satellites (Smallsats) or CubeSats, which are cost-effective and faster to deploy.

3. Science & Technology Linkages

A. Earth Observation Satellites (EOS)

- These are remote-sensing satellites designed for non-military uses such as environmental monitoring and meteorology.
- India's **RISAT** (Radar Imaging Satellite) and **Cartosat** series are the national equivalents used for similar purposes.

B. Low-Earth Orbit (LEO) vs. Geostationary Orbit (GEO) vs Geosynchronous

Feature	Low-Earth Orbit (LEO)	Geosynchronous Orbit (GSO)	Geostationary Orbit (GEO)
Altitude	**160 km to 2,000 km**	**35,786 km**	**35,786 km**
Orbital Period	Approx. **90 to 120 minutes**	**23 hrs, 56 mins, 4 secs** (1 Sidereal Day)	**23 hrs, 56 mins, 4 secs**
Speed	Very High (~27,000 km/h)	Matches Earth's rotation speed	Matches Earth's rotation speed
Position from Earth	Constantly moving/ sweeping across the sky.	Returns to the **same spot** at the same time daily.	Appears **fixed/stationary** in the sky.
Inclination	Can be any (often Polar or Sun-synchronous).	Can be **inclined** (tilted relative to the equator).	**Must be 0°** (Directly over the Equator).
Latency (Delay)	**Low** (Minimal delay in signal).	**High** (Noticeable signal delay).	**High** (Noticeable signal delay).
Resolution	**High Resolution** (closer to Earth).	Lower resolution compared to LEO.	Lower resolution compared to LEO.
Primary Use Cases	Spy satellites, Remote Sensing, International Space Station (ISS), Starlink.	Specialized telecommunications, regional monitoring.	**Satellite TV (DTH)**, Weather satellites (e.g., INSAT), Global Communication.

C. Synthetic Aperture Radar (SAR) Technology

- **Why it matters for Assam:** Traditional optical cameras cannot see through clouds. During the monsoon, Assam is mostly cloud-covered.
- **Mechanism:** SAR uses radar pulses to create 2D or 3D images of landscapes. It can "see" through **clouds, smoke, and darkness**, making it essential for flood monitoring.

4. Strategic & Geographical Linkages

- **The Siliguri Corridor:** A narrow strip of land (~22km wide) in West Bengal that connects the North-Eastern states to the rest of India. It is a vital "choke point" for national security.
- **Brahmaputra Hydrology:** The river is "braided," meaning it constantly changes its path. Satellite data helps in mapping these morphological changes which lead to sudden embankments breaches.

Q. With reference to the AssamSAT initiative, consider the following statements:

1. It aims to provide real-time flood monitoring of the Brahmaputra River.
2. It is India's first national satellite constellation project.
3. It also focuses on border security in sensitive areas like the Siliguri Corridor.

Which of the statements given above is/are correct?

(a) 1 and 3 only

(b) 2 only

(c) 1 and 2 only

(d) 1, 2 and 3

Answer: A

Explanation:

- **Statement 1 is correct:** One of the primary objectives of the **AssamSAT** initiative is to strengthen disaster response by providing real-time satellite monitoring of the flood-prone **Brahmaputra valley**.
- **Statement 2 is incorrect:** While it is a significant project, Assam is the **first Indian State** to float a tender for its own group of earth-observation satellites. It is a **state-level** initiative rather than a "national" satellite constellation project (which would typically be led by a central agency like ISRO for the entire country).
- **Statement 3 is correct:** The satellite mandate explicitly includes surveying the state's borders and monitoring sensitive areas like the **Siliguri Corridor** (the "Chicken's Neck"), which connects the Northeast to the rest of India.

5.4. SCIENCE OF MINERAL AND TAP WATER

Context

Millions of people around the world drink mineral water every day because their tap water is unsafe or because they prefer the taste. It's packed with naturally occurring minerals that support bone and muscle health and governments and health organisations promote it as a clean, reliable source of hydration.

1. **Definition and Origin of Mineral Water**
   - **Source:** Mineral water originates from protected underground reservoirs, such as springs or aquifers, rather than surface sources like rivers.
   - **Natural Acquisition:** It acquires minerals and trace elements through geological processes as rainwater and snowmelt percolate through rock layers like limestone, granite, or sandstone.
   - **Consistency:** Unlike tap water, mineral water must have a specific and stable composition of minerals that remains consistent over time.
2. **Mineral Composition and Effects**
   - **Common Minerals:** Includes calcium, magnesium, sodium, potassium, bicarbonates, sulphates, chlorides, and silica.
   - **Hardness:** High levels of calcium and magnesium make water "hard" and contribute to its distinct mouthfeel.
   - **Flavor Profiles:**
     - **Bicarbonates:** Neutralize acidity and can give water a slightly sweet finish.
     - **Sulphates:** Associated with magnesium-rich springs, adding a faint bitter or saline note.
   - **Total Dissolved Solids (TDS):** Dissolved minerals determine the water's TDS level, which affects how it interacts with food and the human body.
   - **Quick Facts on Water Minerals**

Mineral	Contribution to Water	Effect/Observation
Calcium	**Hardness**	Contributes to bone and muscle health; creates a "chalky" sensation.
Magnesium	**Hardness**	Essential for muscle function; can add a slightly bitter note at high levels.
Bicarbonates	Alkalinity	Helps neutralize acidity and can provide a slightly sweet finish.
Sulphates	Salinity	Often found in magnesium-rich springs; adds a faint bitter or salty taste.

3. **Regulatory Framework in India**
   - **Governing Bodies:** Regulated by the **Food Safety and Standards Authority of India (FSSAI)** and the **Bureau of Indian Standards (BIS)**.
   - **Mandatory Standards:**
     - **Source Protection:** Must come from protected underground sources like natural springs or borewells.
     - **Chemical Treatment:** Producers are **prohibited** from chemically treating the water to alter its mineral composition.
     - **Permitted Processing:** Only physical processes like filtration, decanting, aeration, or sterilization are allowed.
     - **Certification:** Sellers must have an FSSAI license and a BIS certificate (IS 13428).
   - **Labeling:** Labels must state the location and name of the source and the levels of various minerals.
4. **Tap Water vs. Mineral Water in India**
   - **Source of Tap Water:** Primarily drawn from rivers and borewells.
   - **Treatment:** Municipalities use chlorine and alum to disinfect and remove pathogens, a process not required for mineral water if the source is bacteriologically pure.
   - **Regional Variation:**
     - **High Mineral Areas:** Rajasthan, Gujarat, and parts of Delhi-NCR have very high mineral content in groundwater.
     - **Low Mineral Areas:** Mumbai and parts of Kerala have much softer water with lower mineral levels.
   - **Governance:** Tap water is a **State responsibility**, while the Union government sets the standards.
5. **Distilled Water and Industrial Use**
   - **Distillation Process:** Water is boiled into steam and condensed back to liquid, leaving all minerals and contaminants behind.
   - **Human Consumption:** Distilled water is not advised for regular consumption because it lacks essential minerals and can draw minerals out of the body.
   - **Industrial Use:** Industries often demineralize water to prevent scaling in boilers or cooling systems.
6. **Osmosis vs Reverse Osmosis**

Feature	Osmosis	Reverse Osmosis (RO)
Nature of Process	A **natural** and spontaneous biological/physical process.	An **artificial** or mechanical process.

Direction of Flow	Solvent (water) moves from **lower solute concentration** to higher concentration.	Water is forced from **higher solute concentration** (contaminated) to lower concentration (pure).
External Pressure	Does not require any external energy or manual pressure.	Requires **high mechanical pressure** to overcome natural osmotic pressure.
Role of Membrane	The semi-permeable membrane allows water through but blocks large molecules.	The membrane acts as a ultra-fine filter to remove **dissolved salts, minerals, and pathogens**.
Primary Goal	To achieve equilibrium (balance) in concentration on both sides.	To **purify water** by removing contaminants and dissolved solids.
Common Example	Plants absorbing water from the soil through their roots.	Household water purifiers or large-scale desalination of seawater.

7. Common Water-Borne Diseases

- **Bacteria:** Cholera, Typhoid, Dysentery, Shigellosis, E. coli.
- **Viruses:** Hepatitis A, Hepatitis E, Polio, Rotavirus, Norovirus.
- **Protozoa/Worms**: Giardiasis, Cryptosporidiosis, Ascariasis.
- **Chemical/Others:** Arsenicosis, fluorosis, and various infections from harmful algal blooms.

Q. Which of the following minerals contribute to water hardness?

1. Calcium
2. Magnesium
3. Sodium

Select the correct answer:

A. 1 and 2 only

B. 2 and 3 only

C. 1 only

D. 1, 2 and 3

Answer: a

Explanation:

Based on the scientific principles of water chemistry outlined in the provided article:

- **Calcium (1) and Magnesium (2):** These are the primary minerals responsible for water hardness. When water contains high levels of these two minerals, it is classified as "hard" water. These minerals contribute to the "mouthfeel" of the water and are known to form "scales" or mineral deposits in kettles, pipes, and appliances.
- **Sodium (3):** While sodium is a common mineral found in water, it does **not** contribute to hardness. In fact, water softening processes often work by replacing calcium and magnesium ions with sodium ions to "soften" the water.

5.5. STRENGTHENING INDIA'S AIR DEFENCE

Context

India is set to expedite the delivery of the remaining two units of the **S-400 Triumf air defence system** from Russia. Despite previous delays caused by supply chain disruptions and the Russia-Ukraine war, the final deliveries are now scheduled for completion by **November 2026**.

1. **Key Details of the S-400 Deal**
   - **The Agreement**: India signed a **$5.43 billion deal** with Russia in 2018 to procure five squadrons of the S-400 system.
   - **Current Status**: Three units have already been inducted into service; the remaining two are being fast-tracked to enhance national security.
   - **Strategic Collaboration**: Delivery timelines were discussed during high-level bilateral meetings between the Indian Defence Minister and Russian counterparts.

2. **Technical Features of the S-400 Triumf**
   - **Multilayered Protection**: It is a mobile, surface-to-air missile (SAM) system capable of engaging **multiple targets simultaneously**, including aircraft, unmanned aerial vehicles (UAVs), and ballistic and cruise missiles.
   - **Operational Range**: Known as one of the most advanced systems globally, it has a tracking range of up to **600 km** and an engagement range of up to **400 km**.
   - **Engagement Altitude**: Can hit targets at altitudes as high as **30 km**.
   - **System Components**: Includes a multifunction radar, autonomous detection and targeting systems, anti-aircraft missile systems, launchers, and a command-and-control center.

3. **India's Multi-Tiered Air Defence Grid**

   The S-400 acts as the "outer layer" of India's Ballistic Missile Defence (BMD) and general air defence architecture.

Layer	System	Origin	Engagement Range
Very long Range	**Ballistic Missile Defence (BMD) Program-Prithvi Air Defence (PAD)**	Indigenous	50-80 km
Long Range (Outer)	**S-400 Triumf**	Russia	Up to 400 km
Medium Range	**MRSAM (Barak-8)**	Indo-Israel	70–100 km

Short Range	**Akash Missile System**	Indigenous (DRDO)	~25 km
Very Short Range	**VSHORADS / IGMLA-S**	Indigenous / Russia	Up to 6 km

Q. With reference to the S-400 Triumf, consider the following statements:

1. It is a surface-to-air missile system capable of engaging multiple targets simultaneously.
2. It can intercept both cruise missiles and ballistic missiles.
3. Its maximum engagement range is less than 200 km.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 only
(d) 1, 2 and 3

Answer: A

Explanation:

Explanation of Statements:

1. **Statement 1 is correct:** The S-400 is a mobile, surface-to-air missile (SAM) system designed to engage multiple targets simultaneously, including aircraft and unmanned aerial vehicles (UAVs).
2. **Statement 2 is correct:** The system is highly versatile and is capable of intercepting both cruise missiles and ballistic missiles.
3. **Statement 3 is incorrect:** The maximum engagement range of the S-400 is approximately **400 km**, not less than 200 km. It also has a tracking range of up to 600 km.

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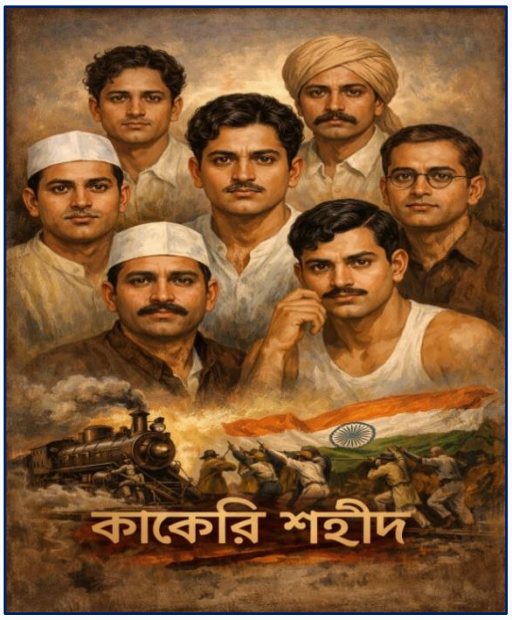
6.1. KAKORI MARTYRS



Context:

Recently, statues of the Kakori train action martyrs were allegedly demolished using a bulldozer during road construction work in Shahjahanpur, sparking outrage.

1. **Key Facts of the Incident**
   - **Date:** August 9, 1925.
   - **Location:** Kakori, a small village near **Lucknow**, Uttar Pradesh.
   - **Target:** The **8-Down Train** traveling from Saharanpur to Lucknow, which was carrying government treasury money.
   - **Organization Involved:** The **Hindustan Republican Association (HRA)**.
   - **Objective:** To secure funds for the HRA's revolutionary activities and to challenge the authority of the British Raj through a high-profile act of resistance.
2. **Important Personalities Involved**
   - **Ram Prasad Bismil:** The main mastermind and leader of the operation.
   - **Ashfaqullah Khan:** The first Muslim to be hanged in a conspiracy case against the British Raj.
   - **Chandrashekhar Azad:** Managed to escape the police net after the incident and later reorganized the HRA into the HSRA.
   - **Other key participants:** Thakur Roshan Singh, Rajendra Lahiri, Sachindra Bakshi, Keshab Chakravarty, Banwari Lal, Mukundi Lal, and Manmath Nath Gupta.
3. **Consequences and Legal Trial**
   - **The Kakori Conspiracy Case:** A long legal battle ensued. The British government arrested around 40 revolutionaries.
   - **Sentences:**
     - **Death Penalty (Hanging):** Ram Prasad Bismil, Ashfaqullah Khan, Thakur Roshan Singh, and Rajendra Lahiri.
     - **Deportation (Kala Pani):** Sachindra Sanyal and Jogesh Chandra Chatterjee.
4. **HRA vs. HSRA: Key Differences**

Feature	HRA (1924)	HSRA (1928)
Influential Text	*The Revolutionary* (Manifesto).	*The Philosophy of the Bomb* (by Bhagwati Charan Vohra).

Key Events	Armed struggle and dacoities for funds (e.g., **Kakori**).	Responsible for the **J.P. Saunders assassination** in 1928 to avenge Lala Lajpat Rai's death and **Central Assembly Bombing (1929):** To protest the Public Safety Bill and Trade Dispute Bill.
Key Leadership	Ramprasad Bismil, Jogesh Chandra Chatterjee, Sachin Sanyal.	Bhagat Singh, Chandrashekar Azad, Sukhdev, Rajguru.
Philosophy	Militant Nationalism.	Scientific Socialism and Internationalism.

UPSC Prelims Pointers:

- **Bandi Jiwan:** Written by **Sachindra Nath Sanyal**; it served as the "Bible" for HRA revolutionaries.
- **"To make the deaf hear":** The slogan used by **Bhagat Singh** and Batukeshwar Dutt during the Assembly Bombing to explain that their intent was not to kill, but to protest repressive laws.

Q. With reference to the Kakori Conspiracy, consider the following statements:

1. It took place near Lucknow in Uttar Pradesh.
2. The target was a train carrying government treasury money.
3. It was carried out by the Hindustan Socialist Republican Association (HSRA).

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 only

(d) 1, 2 and 3

Answer: A

Explanation:

Statement 1 is correct: The Kakori Train Action (historically known as the Kakori Conspiracy) took place on August 9, 1925, at **Kakori**, a small village located near **Lucknow** in present-day Uttar Pradesh.

Statement 2 is correct: The revolutionaries targeted the **8-Down Train** traveling from Saharanpur to Lucknow. Their objective was to seize the **British government treasury money** being transported in the guard's van to fund their revolutionary activities and purchase weaponry.

Statement 3 is incorrect: The action was carried out by the **Hindustan Republican Association (HRA)**. The HSRA (Hindustan *Socialist* Republican Association) was not formed until **September 1928** at Feroz Shah Kotla, Delhi, following the reorganization of the HRA by Chandrashekhar Azad and Bhagat Singh.

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