

#RiseWithRICE



Weekly EXPECTED CURRENT AFFAIRS

for

IAS EXAMINATION



From

04th May to 09th May 2026

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1.1. CENSUS OF INDIA

Context:

- **Recently**, the Government of India officially commenced the first phase of the **16th National Census (Census 2027)** on April 1, 2026, marking the end of a long delay caused by the COVID-19 pandemic and administrative hurdles. The "House Listing and Housing Census" phase is currently underway across various states and Union Territories, including Uttar Pradesh and Karnataka.
- This exercise is historic as it is the **world's first fully digital census** and, for the first time since 1931, it will include a comprehensive **enumeration of castes** across all communities to provide updated socio-economic data for evidence-based governance and the upcoming delimitation exercise.



1. Historical Background

- **Ancient Period:** References to population counts are found in Kautilya's **Arthashastra** (3rd Century BC) and during the Mughal era in **Ain-e-Akbari**.
- **British Period:**
 - The first non-synchronous census was conducted in **1872** under Lord Mayo.
 - The first **synchronous census** (conducted simultaneously across the country) took place in **1881** under Lord Ripon, led by W.C. Plowden.
- **Post-Independence:** The census has been conducted every ten years (decennial) starting from 1951. Census 2027 is the **16th overall** and the **8th after independence**.

2. Legal and Institutional Framework

- **Constitutional Provision:** Population Census is a **Union Subject** listed under **Entry 69** of the **Seventh Schedule** of the Indian Constitution.
- **Legislation:** It is conducted under the **Census Act, 1948**. This Act provides the legal backing for data collection and guarantees the **confidentiality** of the information provided by citizens.
- **Nodal Agency:** The responsibility for the decadal census rests with the **Office of the Registrar General and Census Commissioner of India (ORGI)**, which functions under the **Ministry of Home Affairs (MHA)**.

3. Key Features of Census 2027

- **Digital Transformation:** The transition from paper schedules to a **mobile application** for data collection makes it the first digital census. Enumerators will use smartphones for real-time data entry.
- **Self-Enumeration:** Citizens have been provided with a portal (se.census.gov.in) to fill in their own details before the enumerator's visit. A 16-digit **Self-Enumeration ID (SE ID)** is generated for verification.

- **Caste Enumeration:** Unlike previous post-independence censuses that only counted SCs and STs, this census will record the **caste status of all individuals**, filling a 96-year gap since the last full caste census in 1931.
- **Multi-lingual Approach:** All digital interfaces and questionnaires are available in **16 languages** to ensure inclusivity.

4. Phases of the Census

1. **Phase I (House Listing and Housing Census - HLO):** Scheduled from **April to September 2026**. It involves 31 questions related to house characteristics, amenities (water, electricity, toilets), and household assets (digital devices, vehicles).
2. **Phase II (Population Enumeration - PE):** Scheduled for **February 2027**. This phase captures individual-level data such as age, religion, literacy, occupation, migration, and caste.
 - a. **Reference Date:** March 1, 2027, for most of India; **October 1, 2026**, for snow-bound regions like Ladakh and Jammu & Kashmir.

5. Census vs. Socio-Economic Caste Census (SECC)

Feature	Census	SECC (e.g., 2011)
Legal Status	Conducted under Census Act, 1948.	Not conducted under the Census Act.
Confidentiality	Data is strictly confidential; only aggregate data is released.	Data is used by government departments to grant/withhold benefits.
Objective	Provides a portrait of the population for planning.	Used to identify beneficiaries for welfare schemes.

Q. With reference to the Census of India, consider the following statements:

Statement I: The Census in India is conducted under the legal framework of the Census Act, 1948, and the data collected is protected by a confidentiality clause.

Statement II: Census 2027 is the first exercise since independence where caste-wise enumeration will be conducted for all communities beyond Scheduled Castes and Scheduled Tribes.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I.
- (b) Both Statement I and Statement II are correct and Statement II is not the correct explanation for Statement I.
- (c) Statement I is correct but Statement II is incorrect.
- (d) Statement I is incorrect but Statement II is correct.

Correct Answer: (b)

Solution:

- **STATEMENT I CORRECT:** The Census Act, 1948, governs the census process and ensures that individual data is not shared even with other government departments or courts.

- **STATEMENT II CORRECT:** Since 1951, censuses only recorded SC/ST status. Census 2027 marks the return of a full caste-based count for all categories for the first time since 1931.
- **RELATIONSHIP:** While both are correct, the inclusion of caste (Statement II) is a specific feature of the current census and does not serve as a reason/explanation for the legal framework (Statement I) established in 1948.

1.2. RIGHTS OF PERSONS WITH DISABILITIES (RPWD) ACT, 2016

Context

- **Recently**, the Supreme Court of India expanded the definition of "acid attack victims" under the **Rights of Persons with Disabilities (RPwD) Act, 2016**, to include survivors who were **forcibly administered acid**. Previously, the Act's Schedule narrowly recognized only those disfigured by the "throwing" of acid, thereby excluding victims suffering from severe internal injuries due to ingestion.
- Invoking its extraordinary powers under **Article 142**, a Bench led by Chief Justice of India Surya Kant directed that this inclusion be deemed operative **retrospectively** from the Act's inception in 2016 to ensure such survivors can immediately claim disability benefits and identity cards.



1. Expanded Definition of Disability

- The RPwD Act, 2016, replaced the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.
- It increased the number of recognized disabilities from **7 to 21**.
- **New categories included:** Acid attack victims, dwarfism, muscular dystrophy, and blood disorders like Thalassemia, Hemophilia, and Sickle Cell disease.
- The Central Government maintains the power to notify additional categories of specified disabilities.

2. Benchmarking and Reservations

- **Benchmark Disability:** Defined as a person with at least **40%** of a specified disability.
- **Employment:** Reservation in government vacancies increased from 3% to **4%** for persons with benchmark disabilities.
- **Education:** A reservation of at least **5%** is mandated in higher educational institutions.
- **Free Education:** Every child with a benchmark disability between **6 and 18 years** has the right to free education.

3. Recent Supreme Court Clarification (May 2026)

- **Internal vs. External Injury:** The Court ruled that "disfigurement" must not be limited to external body parts; internal scars and injuries from acid ingestion are now covered.
- **Article 142 Usage:** The Court used this Article to grant interim relief and provide a "deemed amendment" to the Act's Schedule while the formal legislative process is underway.

- **Retrospective Effect:** The benefits for ingestion survivors apply from the very inception of the 2016 Act.

4. Institutional Framework

- **UDID Project:** The government uses the **Unique Disability ID (UDID)** card to create a national database and ensure seamless delivery of benefits.
- **Advisory Boards:** The Act mandates the creation of **Central and State Advisory Boards** on Disability to serve as apex policy-making bodies.
- **Grievance Redressal:** Chief Commissioners and State Commissioners act as regulatory bodies and grievance redressal agencies.

Q. With reference to the Rights of Persons with Disabilities (RPwD) Act, 2016, and recent judicial developments, consider the following statements:

1. The Act recognizes acid attack victims as a category of disability, originally focusing on those disfigured by the throwing of acid.
2. The Supreme Court recently used Article 142 to include victims of forced acid ingestion within the Act's benefits, effective only from the date of the judgment.
3. The Act mandates a 5% reservation for persons with benchmark disabilities in government jobs and 4% in higher educational institutions.

Which of the statements given above is/are correct?

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

Answer: (a)

Solution:

- **STATEMENT 1 IS CORRECT:** The RPwD Act, 2016, included "acid attack victims" as one of its 21 disability categories, but the statutory language initially focused on external disfigurement from "throwing" acid.
- **STATEMENT 2 IS INCORRECT:** While the Supreme Court did use Article 142 to include victims of forced ingestion, it ruled that this inclusion is **operative retrospectively** from the inception of the Act in 2016, not just from the date of the judgment.
- **STATEMENT 3 IS INCORRECT:** The reservation percentages are reversed; the Act mandates **4%** reservation in government jobs and **5%** in higher educational institutions.

1.3 PUBLIC INTEREST LITIGATION (PIL)

Context

- Recently, Justice B.V. Nagarathna of the Supreme Court observed that **Public Interest Litigation (PIL)**, originally designed to bring social justice to the common man, is increasingly being misused. The judge noted that it has often metamorphosed into



"private interest litigation," "publicity interest litigation," and even "paisa (money) interest litigation". These remarks were made during the hearing of review petitions in the **Sabarimala case**, where the court questioned the *locus standi* of certain petitioners and the potential for "meddlers" to exploit the judicial process.

Core Concept: What is PIL?

- Public Interest Litigation is a legal mechanism where a person or a group can file a petition in court for the protection of "Public Interest". It is an essential tool for the Indian judiciary to ensure social justice post-Emergency.
- The seeds of the concept of public interest litigation were initially sown in India by Justice Krishna Iyer, in 1976 in *Mumbai Kamagar Sabha vs. Abdul Thai*.

1. Departure from 'Locus Standi'

- **Traditional Rule:** Traditionally, only the person whose rights are violated can move the court (*Locus Standi*).
- **PIL Exception:** Under PIL, any public-spirited citizen or organization can approach the court for the enforcement of rights on behalf of a person or class of persons who, by reason of poverty or disability, cannot approach the court themselves.
- **Suo Motu Cognizance:** The court can also take up cases on its own (suo motu) based on news reports or letters.

2. Constitutional Basis

- **Judicial Mechanism:** PIL is **not defined in any statute** but is a judge-made law initiated by the Supreme Court (Article 32) and High Courts (Article 226).

3. Evolution and Key Figures

- The concept was pioneered in the late 1970s and early 1980s by **Justice P.N. Bhagwati** and **Justice V.R. Krishna Iyer**.
- **First Case:** *Hussainara Khatoon v. Home Secretary, State of Bihar* (1979) is often regarded as the first PIL, focusing on the rights of undertrial prisoners.

4. Key Exceptions and Constraints

- **No Individual Matters:** PILs are meant for public issues, not personal disputes.
- **Good Faith Requirement:** The case must be filed for genuine public causes, not for personal publicity or political gain.
- **Not a Private Tool:** Misuse can lead to dismissal of the case

5. Applicability

- Can be filed for environmental pollution, bonded labor, neglect of children, atrocities against women, food adulteration, and public health.

6. Types of issues not covered by public interest litigation

There are a few types of issues for which a PIL cannot be filed in the court, as they don't involve public interest. They are personal matters related only to the parties to the suit. They are as follows:

- Tenancy matters between a landlord and a tenant.
- Matters related to admissions in educational institutions between the student and the institution.
- Issues related to providing maintenance to the wife and children between the husband and the wife;
- Plea filed for an early hearing of their case as it involves personal gain only.
- Matters related to pension and gratuity between the aggrieved person and the concerned authority.

7. Issues and Challenges

While PIL was intended to be a "shield" for the vulnerable, it is now often criticized for becoming a "sword" used by individuals for personal or political gains.

Issue	Description
Frivolous Litigation	Petitions filed without adequate research or for purely personal motives.
Judicial Overreach	Critics argue that PILs sometimes lead the judiciary to perform executive or legislative functions.
Backlog of Cases	The influx of "paisa interest" or "publicity interest" cases adds to the already high pendency in the Indian legal system.

Q. With reference to Public Interest Litigation (PIL) in India, consider the following statements:

1. PIL allows any public-spirited individual to approach the court on behalf of others.
2. PIL can only be filed in the Supreme Court under Article 32.
3. Courts can take suo motu cognizance of matters under PIL.

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

Statement 1 is correct: Public Interest Litigation (PIL) is a departure from the traditional rule of *locus standi*. It allows any public-spirited citizen or organization to approach the court for the enforcement of rights on behalf of persons who, due to poverty or disability, cannot approach the court themselves.

Statement 2 is incorrect: While PILs can be filed in the **Supreme Court** under **Article 32**, they can also be filed in **High Courts** under **Article 226**. The statement "only be filed in the Supreme Court" is therefore factually wrong.

Statement 3 is correct: The judiciary possesses the power to take **suo motu cognizance** (action on its own motion) of matters based on news reports, letters, or telegrams, treating them as PILs.

1.4. APPOINTMENT OF SUPREME COURT JUDGES

Context

Recently, the Union Cabinet approved a proposal to increase the sanctioned strength of the Supreme Court from 34 to 38 judges, including the Chief Justice of India, to address the mounting pendency of cases and ensure timely justice. This decision necessitates an amendment to the **Supreme Court (Number of Judges) Act, 1956**, as Article 124(1) of the Constitution empowers Parliament to prescribe the number of judges by law.



1. Constitutional Provisions

- **Article 124(2):** Every Judge of the Supreme Court is appointed by the **President** by warrant under his hand and seal.
- **Consultation:** The President makes the appointment after consultation with such judges of the Supreme Court and High Courts as he deems necessary.
- **Mandatory Consultation:** In the case of an appointment of a judge other than the Chief Justice of India (CJI), the consultation with the CJI is **obligatory**.

2. Evolution of the Collegium and the NJAC

I. The Three Judges Cases (1982–1998)

- **First Judges Case (1982):** Ruled that "consultation" with the CJI did not mean "concurrence," giving the Executive primacy.
- **Second Judges Case (1993):** Reversed the previous ruling, stating "consultation" means "concurrence." This gave birth to the **Collegium System** (CJI + 2 senior-most judges).
- **Third Judges Case (1998):** On a Presidential reference, the SC expanded the Collegium to a **five-member body** (CJI + 4 senior-most judges).

II. The 99th Constitutional Amendment Act, 2014

- To bring more transparency and executive participation into judicial appointments, Parliament passed the **99th Constitutional Amendment Act** and the **National Judicial Appointments Commission (NJAC) Act, 2014**.
- **Purpose:** It sought to replace the Collegium system with a more diverse body known as the **NJAC**.
- **Composition of NJAC:** It was designed as a six-member body comprising:
 - The Chief Justice of India (Chairperson).
 - Two senior-most judges of the Supreme Court.
 - The Union Minister of Law and Justice.
 - Two **"eminent persons"** (nominated by a committee of the PM, CJI, and Leader of Opposition).

III. The Fourth Judges Case (2015): Striking Down NJAC

- In the case of **Supreme Court Advocates-on-Record Association v. Union of India (2015)**, a five-judge Constitution Bench struck down the 99th Amendment by a **4:1 majority**.
- **Violation of Basic Structure:** The Court ruled that judicial independence is a part of the **Basic Structure** of the Constitution.

3. Qualifications for Appointment

To be eligible for appointment as a judge of the Supreme Court, a person must:

- Be a **citizen of India**.
- Have been a judge of a High Court (or High Courts in succession) for at least **five years**; OR
- Have been an advocate of a High Court (or High Courts in succession) for at least **ten years**; OR
- Be a **distinguished jurist** in the opinion of the President.

Note: The Constitution does not prescribe a minimum age for appointment as a judge of the Supreme Court.

4. Tenure and Removal

- **Tenure:** A judge holds office until they attain the age of **65 years**.
- **Resignation:** A judge may resign by writing to the **President**.
- **Removal:** A judge can be removed only by the President on the ground of "proved misbehaviour" or "incapacity," following an address by both Houses of Parliament supported by a **special majority**.

5. Acting Chief Justice and Ad-hoc Judges

- **Acting CJI (Art. 126):** Appointed by the President when the office of CJI is vacant or the CJI is unable to perform duties.
- **Ad-hoc Judges (Art. 127):** If there is a lack of quorum of permanent judges, the CJI can appoint a High Court judge as an ad-hoc judge of the SC for a temporary period, with the previous consent of the President and consultation with the Chief Justice of the concerned High Court.

Q. Consider the following statements regarding the Supreme Court of India:

Statement I: The Parliament has the power to increase the number of judges in the Supreme Court by enacting a law.

Statement II: The Constitution of India mandates that only a person who has served as a judge of a High Court for at least ten years is eligible for appointment as a Supreme Court judge.

Which one of the following is correct in respect of the above statements?

- A) Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I.
- B) Both Statement I and Statement II are correct but Statement II is not the correct explanation for Statement I.
- C) Statement I is correct but Statement II is incorrect.
- D) Statement I is incorrect but Statement II is correct.

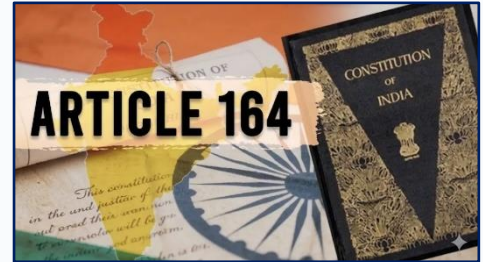
Solution: C

- **STATEMENT I IS CORRECT:** Under Article 124(1), the power to increase the strength of Supreme Court judges rests with the Parliament. This is currently relevant due to the recent Cabinet approval to increase the strength to 38.
- **STATEMENT II IS INCORRECT:** According to Article 124(3), the requirement for a High Court judge to be elevated to the Supreme Court is **five years** of service, not ten years. The ten-year requirement applies to advocates of a High Court.

1.5. ARTICLE 164

Context:

Recently, political tensions in West Bengal reached a peak as Chief Minister publicly refused to resign following demands from opposition parties amidst ongoing controversies and administrative challenges. This development, has sparked a constitutional debate regarding the tenure of a Chief Minister and the Governor's role under **Article 164**, specifically concerning the provision that ministers hold office during the "pleasure of the Governor" and the necessity of maintaining collective responsibility to the Legislative Assembly.



1. Appointment of Ministers (Article 164(1))

- **The Chief Minister:** The Governor appoints the Chief Minister (CM). By convention, the Governor invites the leader of the majority party in the State Legislative Assembly.
- **Other Ministers:** The Governor appoints other ministers based solely on the **advice of the Chief Minister**.
- **Pleasure of the Governor:** Ministers hold office during the "**pleasure of the Governor**." However, this "pleasure" is not arbitrary; a Governor cannot dismiss a minister as long as the Council of Ministers (CoM) enjoys the majority in the Assembly.
- **Special Provision for Tribal Welfare:** In the states of **Chhattisgarh, Jharkhand, Madhya Pradesh, and Odisha**, there must be a Minister in charge of tribal welfare. (Note: Bihar was removed from this list by the 94th Amendment Act, 2006).

2. Strength of the Council of Ministers (Article 164(1A))

- **Maximum Limit:** The total number of ministers, including the CM, in a State CoM shall not exceed **15%** of the total strength of that State's Legislative Assembly.
- **Minimum Limit:** The number of ministers, including the CM, shall not be less than **12**.
- **Origin:** These limits were inserted by the **91st Constitutional Amendment Act, 2003**, to prevent the practice of "jumbo cabinets" used for political appeasement.

3. Disqualification and Tenure (Article 164(1B))

- **Anti-Defection:** A member of the State Legislature who is disqualified under the **Tenth Schedule** (Anti-Defection Law) is also disqualified from being appointed as a minister.
- **Non-Legislator as Minister (Article 164(4)):** A person who is not a member of the State Legislature can be appointed as a minister. However, they must become a member (either

through election or nomination) within **six consecutive months**. Failure to do so leads to the automatic cessation of their ministership.

4. Accountability and Oaths

- **Collective Responsibility (Article 164(2)):** The Council of Ministers is **collectively responsible** to the Legislative Assembly of the State. This means the cabinet "swims or sinks together." If a no-confidence motion is passed, the entire CoM must resign.
- **Oath (Article 164(3)):** Before entering office, the Governor administers the **oaths of office and secrecy** to the ministers according to the forms set out in the Third Schedule.
- **Salaries (Article 164(5)):** The salaries and allowances of ministers are determined by the **State Legislature**

Q. With reference to Article 164 of the Constitution of India, consider the following statements:

Statement I: The Governor has the constitutional authority to dismiss a Chief Minister at any time, as the ministers hold office during the pleasure of the Governor.

Statement II: The Council of Ministers is collectively responsible to the Legislative Assembly of the State.

Which one of the following is correct in respect of the above statements?

- Both Statement I and Statement II are correct and Statement II is the correct explanation for Statement I.
- Both Statement I and Statement II are correct but Statement II is not the correct explanation for Statement I.
- Statement I is correct but Statement II is incorrect.
- Statement I is incorrect but Statement II is correct.

Solution: D

- **STATEMENT I IS INCORRECT:** While the "pleasure" doctrine exists, it is not absolute. The Governor cannot dismiss a Chief Minister who enjoys the majority in the Legislative Assembly. The "pleasure" of the Governor is co-terminus with the majority support in the House.
- **STATEMENT II IS CORRECT:** Article 164(2) explicitly states that the Council of Ministers shall be collectively responsible to the Legislative Assembly of the State. This is the primary mechanism of democratic accountability in the Cabinet system.

1.6. TENURE AND REMOVAL OF THE CHIEF MINISTER (CM)

Context

- In the aftermath of state legislative assembly elections, significant constitutional questions often emerge concerning the resignation of the incumbent Chief Minister, the discretionary authority of the Governor in government formation or removal, and the constitutional validity of electoral outcomes.



- These issues are principally governed by Articles 164 and 172 of the Constitution of India, which collectively define the tenure of the Council of Ministers and the duration of State Legislatures within the framework of parliamentary democracy.

1. Constitutional Provisions: Article 164

- **Appointment:** The CM is appointed by the Governor, and other ministers are appointed by the Governor on the advice of the CM.
- **The "Pleasure" Doctrine:** Article 164(1) states that "the Ministers shall hold office during the pleasure of the Governor."
- **Constituent Assembly Debate:** While the literal reading suggests the Governor has discretionary power to remove a CM, the Constituent Assembly (notably Dr. B.R. Ambedkar) clarified that "pleasure" is not absolute.
- **The Proviso:** A CM and the Council of Ministers (CoM) remain in power only so long as they enjoy the **confidence of the Legislative Assembly (Lower House)**.

2. When does a CM cease to hold office?

A Chief Minister must vacate office under the following circumstances:

- **Loss of Majority (Floor Test):** If the Governor has reason to believe the CM has lost the majority, a **Floor Test** is conducted. If the CM fails to prove support in the House, they must resign.
- **Dissolution of the Assembly:** Under **Article 172**, the normal tenure of an Assembly is **5 years**. Upon the expiration of this period, the Assembly stands dissolved, and the CM automatically ceases to hold office.
- **Dismissal by Governor:** Only if the CM refuses to resign after losing a majority on the floor of the House.
- **President's Rule:** Under **Article 356**, if the constitutional machinery fails, the State Government (including the CM) can be dismissed.

3. Judicial Interpretation

- **A.G. Perarivalan v. State (2022):** The Supreme Court observed that the Governor is the "formal head" and ordinarily bound by the **"aid and advice"** of the Council of Ministers.
- **S.R. Bommai Case (1994):** (Contextual addition) The Court ruled that the majority of a government must be tested on the **floor of the House** and not in the Governor's chambers.

4. Challenging Election Results

If a CM or candidate's election is in question, the following legal routes apply:

- **Election Petition:** Under **Section 100 of the Representation of the People Act (RPA), 1951**, an election can be challenged in the **High Court**.
- **Timeline:** Such a petition must be filed within **45 days** from the declaration of results.
- **Grounds for Challenge:** Corrupt practices, non-compliance with the Constitution/RPA, or improper rejection of nominations.

- **Writ Petition:** If the integrity of the electoral process itself is at stake (e.g., large-scale voter deletion), a writ petition can be filed as it involves a violation of fundamental rights.

Quick Facts for Prelims

Provision	Detail
Article 163	Council of Ministers to aid and advise the Governor.
Article 164	Appointment and tenure of Ministers (Pleasure of Governor).
Article 172	Duration of State Legislatures (5 years unless sooner dissolved).
Floor Test	The constitutional mechanism to prove majority in the House.
High Court	Has original jurisdiction to hear election petitions (RPA 1951).

Q. Consider the following statements regarding the tenure and removal of the Chief Minister in India:

1. Under Article 172 of the Constitution, the normal duration of a State Legislative Assembly is five years unless sooner dissolved.
2. A Chief Minister automatically ceases to hold office upon the dissolution of the Legislative Assembly.
3. The Governor can remove a Chief Minister even if the latter enjoys majority support in the Legislative Assembly.

Which of the statements given above are correct?

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

Answer: A

Explanation:

Analysis of Statements

- **Statement 1 is correct:** According to **Article 172** of the Indian Constitution, every Legislative Assembly of every State, unless sooner dissolved, shall continue for **five years** from the date appointed for its first meeting and no longer. The expiration of the said period of five years operates as a dissolution of the Assembly.
- **Statement 2 is correct:** Since the Chief Minister is a member of the House and heads the Council of Ministers, their legal authority to hold office is tied to the existence of the Legislative Assembly. Once the Assembly is dissolved (either by completion of tenure or by the Governor's order), the CM **automatically ceases to hold office**, though they may be asked to continue as a "caretaker" CM until a new government is formed.
- **Statement 3 is incorrect:** While **Article 164(1)** states that the Chief Minister holds office during the "**pleasure of the Governor**," this pleasure is not arbitrary. Constitutional experts and the Supreme Court (notably in the *S.R. Bommai* case) have affirmed that as long as the Chief Minister commands a **majority in the Legislative Assembly**, the Governor cannot dismiss them. The "pleasure" of the Governor is essentially a shorthand for the "confidence of the House."

1.7. APPOINTMENT OF CEC AND ECS

Context

- **Recently**, the Supreme Court of India questioned whether a "proper debate" was held in Parliament regarding the **Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023**.



- The Court's inquiry focused on whether the "ethos" of its 2023 *Anoop Baranwal* judgment—which aimed to insulate the appointment process from exclusive executive control—was adequately reflected in the legislative debates. This comes in the wake of petitions challenging the exclusion of the **Chief Justice of India (CJI)** from the selection panel, replaced by a Union Cabinet Minister nominated by the Prime Minister.

1. Background: The Legislative Vacuum

- **Article 324(2)**: It states that the President shall appoint the CEC and ECs, subject to any law made by Parliament.
- **Historical Practice**: For over 70 years, no such law was enacted. Appointments were made by the President on the sole advice of the **Prime Minister/Council of Ministers**.

2. The Landmark Anoop Baranwal Case (2023)

A five-judge Constitution Bench ruled that to ensure the independence of the ECI, a selection committee must be formed.

- **The Judicial Committee**: Prime Minister, Leader of Opposition (LoO) in Lok Sabha, and the **Chief Justice of India (CJI)**.
- **Mandate**: This arrangement was meant to be temporary, "until Parliament makes a law."

3. Key Features of the 2023 Act

The Parliament enacted the **Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023**, effectively replacing the Supreme Court's temporary arrangement:

- **The Selection Committee**:
 - **Prime Minister** (Chairperson).
 - **Leader of the Opposition** in Lok Sabha (Member).
 - A **Union Cabinet Minister** nominated by the PM (Member).
- **Appointment Process for Other ECs**: The Act treats the appointment of **Other Election Commissioners** exactly like that of the CEC. They are appointed by the President based on the recommendation of the same three-member Selection Committee.
- **Search Committee**: Headed by the **Cabinet Secretary**, it prepares a panel of five names for the Selection Committee.

- **Eligibility:** Candidates must be persons of integrity and have served in a rank equivalent to the Secretary to the Government of India.
- **Salary and Service Conditions:** The Act equates the salary and status of the CEC and ECs to that of the **Cabinet Secretary** (previously equal to a Supreme Court Judge).

4. Constitutional Safeguards

- **Security of Tenure:** The CEC can only be removed in the same manner as a **Supreme Court Judge** (Impeachment).
- **Other Election Commissioners:** Cannot be removed except on the recommendation of the CEC.
- **Term:** 6 years or until the age of 65, whichever is earlier.

Q. Consider the following statements regarding the Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023:

1. The Selection Committee for the appointment of CEC and ECs includes the Chief Justice of India as a permanent member.
2. The salary of the Chief Election Commissioner is now equivalent to that of a Judge of the Supreme Court of India.
3. A Search Committee headed by the Cabinet Secretary is responsible for suggesting a panel of names to the Selection Committee.

Which of the statements given above is/are correct?

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

Answer: B) 3 only

Solution:

- **STATEMENT 1 IS INCORRECT:** The 2023 Act replaced the Chief Justice of India (CJI) with a **Union Cabinet Minister** nominated by the Prime Minister in the Selection Committee.
- **STATEMENT 2 IS INCORRECT:** The Act changed the status and salary of the CEC and ECs from being equivalent to a **Supreme Court Judge** to being equivalent to the **Cabinet Secretary**.
- **STATEMENT 3 IS CORRECT:** The Act provides for a Search Committee headed by the **Cabinet Secretary** to propose a panel of five names for consideration.

1.8. NATIONWIDE FREE ANNUAL HEALTH CHECK-UP INITIATIVE FOR WORKERS AGED 40 YEARS

Context

- **Recently**, the Union Ministry of Labour and Employment launched a nationwide initiative to provide **free annual health check-ups** for all workers aged **40 years and above**. This scheme, inaugurated on May 7, 2026, by the Union Labour Minister, is anchored in the transformative reforms



introduced through the **four new Labour Codes**. It aims to strengthen the occupational healthcare and social security framework for India's workforce, specifically targeting early detection of non-communicable diseases and promoting long-term well-being.

1. Key Features of the Free Health Check-up Scheme

- **Eligibility:** All workers (insured persons) who have crossed the age of **40 years** are eligible for these check-ups.
- **Frequency:** The health screenings will be conducted **every year** to ensure continuous health monitoring.
- **Implementation Agency:** The scheme is being implemented through the extensive network of **ESIC (Employees' State Insurance Corporation)** hospitals and medical colleges across the country.
- **Scope of Screening:** The check-ups include comprehensive tests such as blood work, ECG, and chest X-rays for early diagnosis of potential health issues.
- **Mandatory Checks:** For workers engaged in **hazardous or dangerous operations** (e.g., handling toxic chemicals or heavy machinery), medical check-ups are **mandatory** regardless of their age.

2. Employees' State Insurance Corporation (ESIC)

- **Statutory Body:** ESIC is a statutory body established under the **Employees' State Insurance Act, 1948**.
- **Administrative Control:** It functions under the aegis of the **Ministry of Labour and Employment**, Government of India.
- **Funding Mechanism:** It is a self-financing social security scheme.
 - **Employer's Contribution:** 3.25% of the wages.
 - **Employee's Contribution:** 0.75% of the wages.
 - **Exemption:** Employees earning less than **₹176 per day** are exempted from payment of their share.
- **Applicability:** The ESI Act applies to factories and other establishments (like shops, hotels, cinemas) employing **10 or more persons**. The current wage ceiling for coverage is **₹21,000 per month** (₹25,000 for persons with disabilities).

3. The Four New Labour Codes: A Brief Overview

The government has consolidated 29 central labour laws into four comprehensive codes to simplify compliance and expand social security:

1. **Code on Wages, 2019:** Ensures minimum wages and timely payment for all workers.
2. **Industrial Relations Code, 2020:** Streamlines dispute resolution and improves ease of doing business.
3. **Social Security Code, 2020:** Extends benefits like ESIC and PF to **unorganized workers, gig workers, and platform workers**.
4. **Occupational Safety, Health and Working Conditions Code, 2020:** Regulates health and safety standards at the workplace.

Significant Reforms

- **Maternity Benefit:** Increased from 12 weeks to **26 weeks**.
- **Gig Workers:** India is among the first few countries to proactively bring gig and platform workers under a social security framework.
- **Gender Neutrality:** Provisions for equal wages for men and women and allowing women to work night shifts with safety measures.

Q. With reference to the recently launched Annual Health Check-up initiative and the Employees' State Insurance (ESI) scheme, consider the following statements:

1. The free annual health check-up is mandatory for all workers across all age groups in India.
2. The ESI scheme is a self-financing health insurance scheme where both employers and employees contribute.
3. The Code on Social Security, 2020, for the first time, provides for the inclusion of gig and platform workers under social security benefits.

How many of the statements given above are correct?

- A) Only one
- B) Only two
- C) All three
- D) None

Answer: B) Only two

Solution:

- **STATEMENT 1 IS INCORRECT:** According to the scheme launched, free annual health check-ups are specifically for workers aged **40 years and above**. It is only mandatory regardless of age for those working in hazardous occupations.
- **STATEMENT 2 IS CORRECT:** The ESI scheme is contributory, with employers currently contributing 3.25% and employees contributing 0.75% of the wages.
- **STATEMENT 3 IS CORRECT:** The Code on Social Security, 2020, expanded the definition of workers to include gig workers and platform workers, allowing the government to frame specific social security schemes for them.

1.9. HUNG ASSEMBLY

Context:

- **Recently**, the results of the 2026 Legislative Assembly elections in Tamil Nadu have led to discussions regarding a "**Hung Assembly**" and the subsequent role of the Governor. In Tamil Nadu, the emergence of the TVK as a significant player alongside established Dravidian parties has created a scenario where no single party or pre-poll alliance secured an absolute majority.



1. Definition

A **Hung Assembly** is a situation in a multi-party system, following an election, where no single political party or pre-poll alliance achieves an **absolute majority** (i.e., more than 50% of the total seats) in the legislature. While the term is not expressly defined in the Constitution of India, it is a functional political state that triggers the **discretionary powers** of the Head of State (Governor at the State level, President at the Union level).

2. Constitutional Provisions

- **Article 164(1):** Stipulates that the Chief Minister shall be appointed by the Governor. In a clear majority scenario, this is a formal act; in a hung assembly, it becomes a discretionary act.
- **Article 163:** Provides the Governor with discretionary powers. Unlike the President, the Governor has a wider ambit of situational discretion, as the Constitution explicitly mentions "except in so far as he is... required to exercise his functions or any of them in his discretion."

3. Order of Preference (As per Sarkaria Commission)

When no party has a clear majority, the Governor should follow a specific order of preference to ensure a stable government:

1. **Pre-poll Alliance:** The group of parties that contested the elections together.
2. **Single Largest Party (SLP):** The party with the most seats, claiming support from others (including independents).
3. **Post-poll Coalition:** A new alliance formed after the results, where all partners join the government.
4. **Post-poll Alliance:** Where some parties join the government and others support it from the outside.

4. Judicial and Committee Guidelines

- **S.R. Bommai v. Union of India (1994):** The Supreme Court ruled that the "floor of the house" is the only place to test a majority, not the Governor's subjective opinion.
- **Punchhi Commission (2007):** Recommended that in case of a post-poll alliance, the Governor should invite the alliance only if it has a clear leader and a common minimum program.
- **Rameshwar Prasad Case (2006):** Asserted that if a Governor is convinced that no party can form a stable government, they can recommend the dissolution of the house, but such a decision is subject to judicial review.

5. The Floor Test

The Governor usually gives the appointed Chief Minister a specific timeframe (often 15 to 30 days) to prove their majority through a **Vote of Confidence**. If the CM fails, the Governor may invite the next eligible leader or recommend **President's Rule** under **Article 356** due to the failure of constitutional machinery.

Q. With reference to a 'Hung Assembly' in the Indian parliamentary system, consider the following statements:

1. The term 'Hung Assembly' is explicitly defined under Article 164 of the Constitution of India.

2. According to the S.R. Bommai case, the Governor's assessment of a party's majority is final and cannot be challenged in a court of law.
3. The Sarkaria Commission suggested that a pre-poll alliance should be given higher priority over the single largest party during government formation.

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:** The term "Hung Assembly" is a political convention and is **not defined** anywhere in the Constitution.
- **STATEMENT 2 IS INCORRECT:** The S.R. Bommai judgment established that the majority must be proved on the **floor of the house**, and the Governor's action (specifically recommending President's Rule) is subject to **judicial review**.
- **STATEMENT 3 IS CORRECT:** The Sarkaria Commission explicitly listed the **pre-poll alliance** as the first preference for the Governor when inviting a leader to form the government.

1.10. NATIONAL CRIME RECORDS BUREAU (NCRB)

Context

Recently, the National Crime Records Bureau (NCRB) released its annual "**Crime in India 2024**" report on May 6, 2026, which revealed a significant **6% decline** in overall cognizable crimes across the country compared to the previous year. This report, highlights that while traditional crimes like murder and kidnapping saw a marginal dip, **cybercrimes** witnessed a sharp surge of nearly **18%**, reflecting an evolving internal security challenge in the digital age.



1. About National Crime Records Bureau (NCRB)

- **Establishment:** The NCRB was set up in **1986** based on the recommendations of the **Tandon Committee**, the National Police Commission (1977-81), and a Ministry of Home Affairs (MHA) Task Force (1985).
- **Ministry:** It functions as an attached office under the **Ministry of Home Affairs (MHA)** and is headquartered in New Delhi.
- **Objectives:** It serves as a central repository for crime and criminal data to assist investigators and policymakers. It was formed by merging the Inter-State Criminals Data Branch, the Directorate of Coordination and Police Computer (DCPC), and the Central Finger Print Bureau (CFPB) of the CBI.

- **Repository Role:** It maintains the **National Fingerprint Database** of both Indian and foreign offenders and implements the **Crime and Criminal Tracking Network & Systems (CCTNS)**.

2. Key Findings: Crime in India 2024 Report

- **Overall Crime Rate:** Total cognizable crimes stood at 58.85 lakh in 2024, down from 62.41 lakh in 2023. The crime rate per lakh population dropped to **418.9**.
- **Cybercrime Surge:** A total of **1,01,928 cases** were registered, marking a 17.9% increase. Approximately **72.6%** of these cases were related to **financial fraud**.
- **Crimes Against Women:** There was a marginal decline of 1.5% (4.41 lakh cases). However, "**Cruelty by Husband or Relatives**" remains the leading cause of reported violence against women.
- **Economic Offences:** These rose by **4.6%**, largely driven by forgery, cheating, and fraud (FCF).
- **State Performance:** **Telangana** reported a sharp rise in total crimes, while **Nagaland** continued to record the lowest crime rate in the country. **Kerala** maintained the highest charge-sheeting rate at 94.5%.

3. Major Digital Initiatives

- **CCTNS (Crime and Criminal Tracking Network & Systems):** A Mission Mode Project under the National e-Governance Plan that interconnects over 17,000 police stations. It enables real-time data entry of FIRs and investigation reports.
- **ICJS (Integrated Criminal Justice System):** It integrates the five pillars of the justice system—Police (CCTNS), e-Courts, e-Prisons, Forensics, and Prosecution—to ensure seamless data transfer and faster trial processing.
- **National Digital Police Portal:** Provides a single-window interface for citizens to report crimes (especially cybercrimes against women/children) and for police to search the national criminal database.

4. Major Publications of NCRB

1. **Crime in India:** The primary annual report on crime statistics.
2. **Accidental Deaths & Suicides in India (ADSI):** Detailed statistics on unnatural deaths.
3. **Prison Statistics India:** Annual report on jail populations, infrastructure, and prisoner demographics.
4. **Fingerprints in India:** Data regarding the usage and efficiency of fingerprint technology in criminal identification.

Q. Consider the following statements regarding the National Crime Records Bureau (NCRB):

1. It was established based on the recommendations of the Santhanam Committee on Prevention of Corruption.
2. The Bureau is responsible for the implementation of the Crime and Criminal Tracking Network & Systems (CCTNS) in India.
3. The "Prison Statistics India" is an annual publication released by the Ministry of Social Justice and Empowerment using data from NCRB.

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 I INCORRECT:** The NCRB was established based on the recommendations of the **Tandon Committee** and the National Police Commission, not the Santhanam Committee (which is associated with the CVC).
- **STATEMENT II CORRECT:** The NCRB is the nodal agency for the implementation and management of the **CCTNS** project across India.
- **STATEMENT III INCORRECT:** "Prison Statistics India" is an annual publication of the **NCRB** itself, which functions under the **Ministry of Home Affairs**, not the Ministry of Social Justice and Empowerment.

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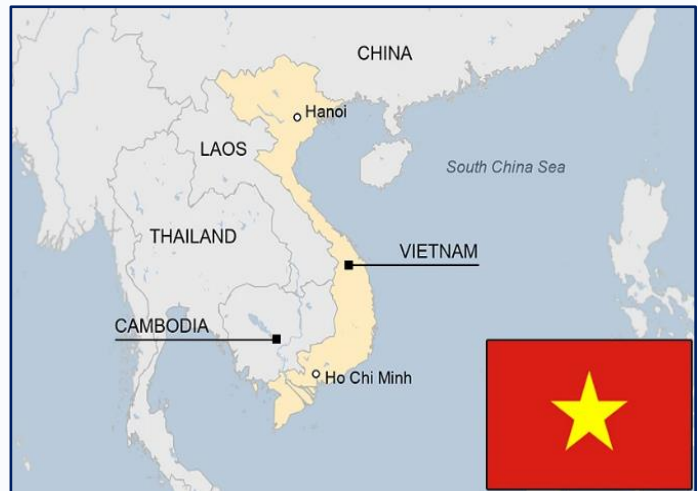
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INTERNATIONAL RELATIONS

2.1. INDIA-VIETNAM "ENHANCED COMPREHENSIVE STRATEGIC PARTNERSHIP"

Context:

Recently, the Vietnamese President **To Lam** paid a State Visit to India. This visit resulted in the elevation of bilateral ties to an "**Enhanced Comprehensive Strategic Partnership**" (a step above the 2016 Comprehensive Strategic Partnership). The visit marks the **10th anniversary** of their strategic partnership and reinforces Vietnam as a "major pillar" of India's **Act East Policy** and **Vision SAGAR**.



1. Strategic & Defense Cooperation

Defense is the "central pillar" of this relationship, focusing on a "shared vision for the Indo-Pacific."

- **Joint Vision 2030:** Guided by the 'Joint Vision Statement on India-Vietnam Defence Partnership towards 2030'.
- **Defense Lines of Credit (LoC):** India has extended LoCs totaling over **\$400 million** for defense procurement and high-speed guard boats.
- **Key Assets:** India recently gifted the indigenously built missile corvette **INS Kirpan** to Vietnam (2023).
- **Military Exercises:** **VINBAX** (Army exercise) and regular naval PASSEX and OTRs (Operational Turn Arounds).
- **Maritime Security:** Both nations emphasize adherence to **UNCLOS 1982** and a "Code of Conduct" in the **South China Sea**.

2. Economic & Digital Integration

- **Trade Target:** A new goal of **\$25 billion** bilateral trade by **2030** (up from current \$16 billion).
- **Digital Payments:** Linking India's **UPI** with Vietnam's **NAPAS** (fast payment system) for cross-border QR code interoperability.
- **Rare Earths & Critical Minerals:** A landmark MoU between **IREL (India) Ltd.** and Vietnam's **ITRRE** for cooperation in rare earth elements, vital for the EV and defense sectors.
- **Agriculture:** Facilitating "pests-free" trade for fruits like Indian pomegranates/grapes and Vietnamese durian/pomelo.

3. Cultural & Development Partnership

- **Civilizational Links:** Shared **Buddhist and Cham heritage**. India is actively restoring the **My Son Sanctuary** (UNESCO site) and **Nhan Tower**.
- **Education:** Over 200 annual slots under **ITEC** (Indian Technical and Economic Cooperation) for Vietnamese professionals.

- **Humanitarian Aid: Operation Sadbhav** (2024) saw India delivering 35 tons of relief to Vietnam after Typhoon Yagi.

4. All about Vietnam

I. Political System

- Socialist Republic with a one-party system.
- Governed by the Communist Party of Vietnam.
- **Capital:** Hanoi
- **Largest City:** Ho Chi Minh City

II. Economic System

- Socialist-oriented market economy under the Đổi Mới reforms (1986).
- **Major sectors:** manufacturing, agriculture, electronics, textiles, and tourism.
- **Major exports:** rice, coffee, smartphones, garments, and seafood.
- **Minerals:** Vietnam is well-endowed with significant mineral reserves, holding the world's second-largest rare earth deposits (estimated at 22–30 million tonnes) and substantial bauxite, coal, and tungsten reserves.

III. Geographical Borders

- Borders China to the north.
- Borders Laos and Cambodia to the west.
- Eastern coastline along the South China Sea.
- **Major rivers:** Mekong and Red River.
- The Mekong River flows through **six countries:** China (where it originates), Myanmar, Laos, Thailand, Cambodia, and Vietnam.
- **Famous natural sites:** Ha Long Bay, Phong Nha-Ke Bang National Park

Q. Consider the following statements regarding India–Vietnam relations:

1. Vietnam is an important pillar of India's Act East Policy and Indo-Pacific strategy.
2. Vietnam follows a socialist-oriented market economy introduced through the Đổi Mới reforms.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: C

Explanation:

- **Statement 1 is correct:** In numerous official statements, including the recent 2026 visit by President To Lam, India has consistently referred to Vietnam as a "**major pillar**" of its **Act East Policy**. Vietnam is also a key partner in India's **Vision SAGAR** (Security and Growth for All in the

Region) and the **Indo-Pacific Oceans Initiative (IPOI)**, serving as a strategic balancer in the South China Sea.

- **Statement 2 is correct:** Vietnam transitioned from a centrally planned economy to a "**socialist-oriented market economy**" following the **Đổi Mới** (Renovation) reforms launched in 1986. These reforms encouraged private enterprise and foreign investment while maintaining the state's socialist framework. This economic shift is the primary reason why bilateral trade between India and Vietnam has grown to approximately **\$16 billion** today.

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3.1. ELECTRONIC GOLD RECEIPTS (EGRS)

Context

Recently, the **National Stock Exchange (NSE)** launched the **Electronic Gold Receipts (EGRs)** segment. This move fulfills a 2018-19 Union Budget announcement to establish a regulated gold exchange in India, aiming to transition the gold market from fragmented to a centralized, transparent ecosystem.



1. Understanding Electronic Gold Receipts (EGRs)

Electronic Gold Receipts are **dematerialized securities** that represent ownership of physical gold. Unlike "digital gold" sold by private apps, EGRs are regulated financial instruments traded on stock exchanges, much like shares.

I. The Three-Tranche Mechanism

The operational framework of the Gold Exchange is divided into three distinct phases:

- **First Tranche (Conversion):** Physical gold is deposited in a SEBI-accredited vault. The **Vault Manager** then creates an EGR in the depositor's demat account.
- **Second Tranche (Trading):** These EGRs are traded on the stock exchange (NSE/BSE) on a continuous basis, allowing for real-time **price discovery**.
- **Third Tranche (Redemption):** An investor can surrender the EGR and convert it back into physical gold delivered from the vault.

II. Regulatory Framework

- **Legal Status:** The Government of India has notified EGRs as '**securities**' under the **Securities Contracts (Regulation) Act, 1956 (SCRA)**.
- **Regulator:** The **Securities and Exchange Board of India (SEBI)** is the primary regulator for the entire EGR ecosystem, including Vault Managers.
- **Standardization:** To ensure quality, the gold must comply with either the **LBMA (London Bullion Market Association) Good Delivery Standard** or the **India Good Delivery Standard**.

2. Key Facts: EGRs vs. Other Gold Instruments

Feature	Electronic Gold Receipts (EGRs)	Sovereign Gold Bonds (SGBs)	Gold ETFs
Issuer/Regulator	SEBI	RBI (on behalf of Govt)	SEBI
Underlying Asset	Physical Gold in Vaults	Not backed by physical gold	Physical Gold / Gold instruments
Redeemability	Can be converted to physical gold	Cash only at maturity	Cash or Gold (for large units)

Interest	No fixed interest	2.5% fixed interest per annum	No fixed interest
Usage	Can be used as collateral for loans	Can be used as collateral	Generally not used for loans
Maturity	Perpetual	8 years	Perpetual

Q. With reference to Electronic Gold Receipts (EGRs) recently launched in India, consider the following statements:

1. They are classified as 'securities' under the Securities Contracts (Regulation) Act, 1956.
2. The entire ecosystem, including vault managers, is regulated by the Reserve Bank of India (RBI).
3. EGRs allow for the conversion of physical gold into a dematerialized form that can be traded on stock exchanges.

Which of the statements given above are correct?

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

Answer: C

Explanation:

Statement 1 is correct: The Government of India has officially notified **Electronic Gold Receipts (EGRs)** as 'securities' under the **Securities Contracts (Regulation) Act, 1956 (SCRA)**. This legal classification allows them to be traded, cleared, and settled on recognized stock exchanges just like shares.

Statement 2 is incorrect: The entire ecosystem of the Gold Exchange, including the **Vault Managers** who store the physical gold, is regulated by the **Securities and Exchange Board of India (SEBI)**. While the RBI regulates the gold monetization scheme and SGBs, SEBI has the mandate for the EGR segment to ensure market integrity and investor protection.

Statement 3 is correct: The core purpose of EGRs is to allow physical gold to be deposited in a vault and converted into an electronic (dematerialized) receipt. This receipt can then be traded on the stock exchange, providing a transparent and efficient platform for price discovery.

4.1. ABROLHOS MARINE NATIONAL PARK

Context:

Recently, the coral cover of Brazil's Abrolhos reefs—the most biodiverse coral ecosystem in the South Atlantic—has fallen by around 15% over 18 years due to climate change and human activity.



1. About the Abrolhos Marine National Park

The **Abrolhos Marine National Park** (*Parque Nacional Marinho dos Abrolhos*) is a pristine archipelago and marine sanctuary located in the South Atlantic, roughly 70 kilometers off the coast of Bahia, Brazil. Established in 1983, it was the first of its kind in the country and protects the largest and most biodiverse coral reef system in the South Atlantic.

I. Unique Geological & Coral Formations

The park is world-renowned for its "**Chapeirões**"—mushroom-shaped coral pinnacles that rise up to 25 meters from the sandy seafloor.

- **Endemic Species:** It is the primary home of the Brain Coral (*Mussismilia braziliensis*), a species found only in Brazilian waters.
- **Biodiversity:** The area supports over 1,300 species, including sea turtles, reef sharks, and the endemic Parrotfish.

II. Seasonal Highlight: Humpback Whales

From **July to November**, the park becomes a critical nursery for Humpback Whales migrating from Antarctica.

- **Whale Watching:** The warm, shallow waters are ideal for mating and calving. Visitors during this time can frequently see breaches and hear "songs" from the males.
- **Research Hub:** It is considered the most significant breeding ground for these mammals in the entire South Atlantic.

2. About Coral Reefs

Coral reefs are underwater ecosystems formed by colonies of coral polyps held together by calcium carbonate. Often called the "rainforests of the sea," they occupy less than 0.1% of the ocean floor but support over 25% of all marine species (National Marine Sanctuary Foundation, 2020).

I. Types of Coral Reefs

There are three primary types of coral reefs, distinguished by their formation and relationship to land:

- **Fringing Reefs:** The most common type, these grow seaward directly from the shore of islands or continents.

- **Barrier Reefs:** Similar to fringing reefs but separated from the shoreline by a deep lagoon (e.g., the Great Barrier Reef).
- **Atolls:** Rings of coral that surround a central lagoon, usually formed when a fringing reef grows around a volcanic island that eventually sinks (National Marine Sanctuary Foundation, 2020).

II. Impact of Climate Change on Coral Reefs

Climate change poses an existential threat to coral ecosystems through several mechanisms:

- **Coral Bleaching:** As ocean temperatures rise, corals experience thermal stress and expel the symbiotic algae (*zooxanthellae*) living in their tissues. These algae provide corals with food and their vibrant colors. Without them, the coral turns white (bleaches) and is at high risk of starvation and disease (The SEA People, 2024).
- **Ocean Acidification:** The ocean absorbs a significant portion of atmospheric CO₂, which lowers the pH of seawater. This increased acidity reduces the availability of carbonate ions, making it difficult for corals to build and maintain their calcium carbonate skeletons (The SEA People, 2024).
- **Sea Level Rise:** Rapidly rising sea levels can lead to increased sedimentation. Silt and runoff can "smother" corals, blocking the sunlight needed for photosynthesis (The SEA People, 2024).
- **Extreme Weather:** Increased intensity of tropical storms can physically destroy reef structures, which take decades to regrow (The SEA People, 2024).

III. Conservation Efforts in India

India has four major coral reef regions: **Andaman and Nicobar Islands, Lakshadweep, Gulf of Mannar, and Gulf of Kachchh** (Madras School of Economics, 2018).

- **Legal Protection:** Corals are protected under **Schedule I** of the Wildlife Protection Act, 1972, granting them the highest level of legal protection in India.
- **Marine Protected Areas (MPAs):** India has established several MPAs, such as the Gulf of Mannar Marine National Park, to regulate human activities and prevent habitat destruction.
- **Restoration Projects:**
 - In the **Gulf of Mannar**, authorities and researchers have successfully transplanted seized poached corals onto artificial reef modules with a survival rate of over 60%.
 - **Mineral Accretion Technology (Biorock):** This technology has been piloted in the Gulf of Kachchh to accelerate coral growth using small electrical currents.
- **Coastal Regulation Zone (CRZ):** Specific rules (like CRZ4 for Andaman and Nicobar) prohibit the use of corals and beach sand for construction and restrict dredging near reef formations (Madras School of Economics, 2018).

IV. International Conservation Efforts

Global cooperation is essential given that climate change is a transboundary issue.

- **CORDAP (Coral Research & Development Accelerator Platform):** Launched by **G20** nations in 2020, CORDAP is the only international organization solely dedicated to funding global R&D for coral restoration and conservation at scale (CORDAP, 2020).

- **ICRI (International Coral Reef Initiative):** An informal partnership among nations and organizations which strives to preserve coral reefs and related ecosystems worldwide.
- **GCRMN (Global Coral Reef Monitoring Network):** This network provides scientific data on the status and trends of coral reef ecosystems to help guide policy decisions.
- **The Paris Agreement:** By aiming to limit global warming to well below 2 degree above pre-industrial levels, this treaty is considered the single most important factor for the long-term survival of reefs (IUCN).

Q. Consider the following statements regarding coral reefs:

1. Coral reefs occupy less than 1% of the ocean floor but support a large proportion of marine species.
2. Coral reefs are formed by calcium carbonate secreted by coral polyps.
3. Atolls are formed when volcanic islands subside and coral reefs grow around them.

Which of the statements given above are correct?

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

Answer: D

Explanation:

Statement 1 is correct: While coral reefs cover a tiny fraction—approximately **0.1% to 1%**—of the ocean's surface area, they are incredibly dense hubs of life. They provide habitat, food, and breeding grounds for roughly **25% of all marine species**, including fish, mollusks, worms, crustaceans, and echinoderms.

Statement 2 is correct: Corals are colonial marine invertebrates. Most "hard" corals have a symbiotic relationship with algae called zooxanthellae. The coral polyps extract calcium and carbonate ions from seawater to secrete a hard **calcium carbonate (CaCO_3) skeleton** that forms the physical structure of the reef.

Statement 3 is correct: This describes the **Darwinian Theory of Atoll Formation**. It begins with a fringing reef growing around a volcanic island. As the island slowly subsides (sinks) due to tectonic shifts or erosion, the coral continues to grow upward toward the light. Eventually, the island disappears below sea level, leaving a ring-shaped reef (the atoll) surrounding a central lagoon.

4.2. THE DILEMMA OF CRITICAL MINERALS

Context

- As the world transitions toward a low-carbon future, the demand for renewable energy technologies—such as wind turbines, solar panels, and electric batteries—has skyrocketed. However, these "green" solutions rely heavily on the extraction of finite, non-renewable resources



like lithium, cobalt, and rare-earth elements. This has sparked a global debate on whether mining, an inherently extractive process, can ever truly be "sustainable".

1. Sustainable Mining: An Economic and Environmental Oxymoron?

I. The Inherent Conflict

Mining is fundamentally a non-sustainable activity in the commonsensical sense because it extracts finite resources that do not grow back. The environmental footprint is significant, often resulting in:

- **Pollution:** Contamination of air, water, and soil during extraction.
- **Landscape Alteration:** Permanent changes to the Earth's surface.
- **Biodiversity Loss:** Destruction of pristine ecosystems and rainforests that no amount of technology can fully restore.

II. The Concept of "Weak Sustainability"

To reconcile the need for minerals with environmental goals, organizations like the UN and the International Energy Agency (IEA) have introduced the idea of **weak sustainability**.

- **Core Argument:** Mining is considered sustainable if the value created from the extracted resources (e.g., human capital through education and infrastructure) outlasts the lifespan of the mine itself.
- **Inescapability:** Proponents argue that since green technologies require these minerals, mining is an inescapable necessity for a low-carbon future.

III. "Responsible Mining" Frameworks

Industries are increasingly adopting "responsible mining" practices to mitigate their immediate impact. Key pillars include:

- **Green Powering:** Using green hydrogen, solar, or wind power to run mining equipment and trucks.
- **Community Engagement:** Seeking explicit permission from local communities to operate.
- **Profit Sharing:** Ensuring that a portion of the mining revenue is shared directly with the local inhabitants.

IV. The Recycling Bottleneck

A major hurdle to achieving a circular mineral economy is the current recycling rate.

- **Current Rate:** For many critical minerals, the global recycling rate is currently at best only **5%**.
- **Future Goal:** To reduce reliance on fresh mining, minerals must be recycled almost indefinitely once they have been extracted and used in products.

2. Major Mineral Production by Country

Mineral	Top Producer	Other Major Producers
Iron Ore	Australia	Brazil, China, India
Gold	China	Australia, Russia, Canada

Aluminum	China	India, Russia, Canada
Silver	Mexico	China, Peru, Chile
Nickel	Indonesia	Philippines, Russia, New Caledonia
Coal	China	India, Indonesia, USA

3. Mineral-Wise Leading States

Mineral	Leading State	Notable Regions/Mines
Iron Ore	Odisha	Mayurbhanj, Keonjhar (Joda-Barbil belt)
Coal	Chhattisgarh / Odisha	Korba (CG), Talcher (Odisha), Jharia (JH)
Bauxite (Aluminum)	Odisha	Kalahandi, Koraput (Panchpatmali)
Manganese	Madhya Pradesh	Balaghat (Bharveli mine)
Copper	Madhya Pradesh	Malanjkhand (Largest open-cast copper mine)
Chromite	Odisha	Sukinda Valley (Produces ~95% of India's supply)
Limestone	Rajasthan	Chittorgarh, Jodhpur
Gold	Karnataka	Kolar Gold Fields (KGF), Hutti Mines

Q. With reference to critical minerals, consider the following statements:

1. They are renewable resources that can be replenished naturally.
2. They are essential for technologies like electric batteries and solar panels.
3. Their extraction has no significant environmental impact.

Which of the statements given above are correct?

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

Answer: A

Explanation:

1. **They are renewable resources that can be replenished naturally (Incorrect):** Critical minerals such as lithium, cobalt, and copper are **finite, non-renewable resources**. Once extracted from the ground, they do not grow back. To maintain a steady supply without constant new mining, these materials must be recycled almost indefinitely.
2. **They are essential for technologies like electric batteries and solar panels (Correct):** The transition to a low-carbon future is heavily dependent on these minerals. Wind turbines, solar panels, and electric batteries all require specific elements like lithium, cobalt, and rare-earth elements to function efficiently.

3. Their extraction has no significant environmental impact (Incorrect): Mining for critical minerals is far from impact-free. The process often **pollutes the environment**, destroys biodiversity, and permanently changes landscapes. Even with technologies designed to reduce footprints, mining remains an extractive process that cannot restore pristine ecosystems like rainforests once they are destroyed.

4.3. LAND SUBSIDENCE IN MEXICO CITY

Context

Recent satellite imagery from the **NISAR satellite** has revealed that Mexico City is sinking at an alarming rate of nearly **50 cm per year**, making it one of the world's fastest-subsiding metropolises.



1. Geomorphological Background

- **Location & Terrain:** Mexico City is built atop an **ancient lake bed**.
- **Historical Context:** Historically, indigenous groups used canals (chinampas), but modern urban development has led to massive land alterations.
- **Key Cause:** The primary driver of subsidence is **excessive groundwater pumping** and urban development, which causes the underlying aquifer to shrink and compact.

2. Impact of Land Subsidence

- **Infrastructure Damage:** Subsidence causes tilting and structural damage to monuments (e.g., Metropolitan Cathedral, Angel of Independence), housing, and critical infrastructure like the subway and drainage systems.
- **Water Crisis:** The contracting aquifer contributes to a chronic potable water shortage.

- **Magnitude:** In less than a century, some parts of the city have dropped by more than **10 meters**.

3. Science and Technology: The NISAR Mission

- **Definition:** NISAR stands for **NASA-ISRO Synthetic Aperture Radar**.
- **Collaboration:** It is a joint initiative between **NASA** (USA) and **ISRO** (India).
- **Capability:** It tracks real-time changes on the Earth's surface with high-resolution "hair-thin" discrimination.
- **Global Utility:** Beyond urban subsidence, the technology is used to track:
 - Natural disasters and fault line changes.
 - Climate change effects in regions like Antarctica.
 - Volcanic eruption warning systems.

4. Geographical Features

- Located in **North America**, south of United States.
- Bounded by **Pacific Ocean (west)** and **Gulf of Mexico & Caribbean Sea (east)**.
- Major landforms:
 - **Sierra Madre Occidental (west)** and **Sierra Madre Oriental (east)** mountain ranges
 - **Mexican Plateau** (central highland region)
- Highest peak: **Pico de Orizaba (Citlaltépetl)** – a volcanic mountain
- Major rivers:
 - **Rio Grande** (forms US–Mexico border)
 - Lerma, Balsas

5. Borders & Location

- Shares land borders with:
 - United States (north)
 - Guatemala and Belize (southeast)
- Maritime proximity to **Caribbean islands**
- Important strategic location for **North American trade**

6. Economic Features

- Classified as an **upper-middle-income economy**
- Member of **OECD**
- Key sectors:
 - Manufacturing (automobiles, electronics)
 - Oil (state company Pemex)
 - Agriculture (maize, coffee, sugarcane)
- Major export partner: **United States**

- Important concept: **Maquiladora industries** (export-oriented factories near border)

7. Environment & Climate

- Lies in **tropical and subtropical zones**
- Climate types:
 - Arid (north), tropical (south), temperate (central highlands)
- Part of **Mesoamerica Biodiversity Hotspot**
- Rich biodiversity: tropical rainforests, deserts, mangroves

Q. With reference to land subsidence in Mexico City, consider the following statements:

1. The city is built on an ancient lake bed.
2. Excessive groundwater extraction is a major cause of subsidence.
3. Subsidence leads to expansion of aquifers beneath the city.

Which of the statements given above are correct?

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

Answer: (a) 1 and 2 only

Explanation:

Statement 1 is Correct: Mexico City is built on the bed of the former **Lake Texcoco**, an ancient lake system. This soft, water-rich sediment makes the ground highly susceptible to subsidence.

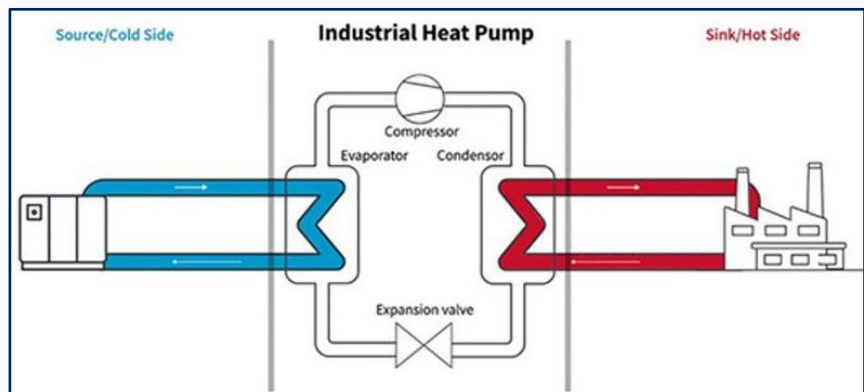
Statement 2 is Correct: Excessive **groundwater extraction** is the primary cause of subsidence. When water is pumped out, the underlying aquifer loses pressure, causing the soil layers to **compact and sink**.

Statement 3 is Incorrect: Subsidence does **not expand aquifers**. Instead, it causes **compaction and shrinking of aquifer spaces**, reducing their water-holding capacity and worsening water scarcity.

4.4. INDUSTRIAL HEAT PUMPS (IHPS) AND INDUSTRIAL DECARBONISATION

Context

As India pushes toward its Net-Zero goals, the focus is shifting toward "hard-to-abate" sectors. While technologies like Green Hydrogen are still in the early stages of adoption, **Industrial Heat Pumps (IHPs)** have emerged as a ready-to-deploy



solution for low-to-medium temperature process heat. Decarbonizing industrial heat is critical as it

accounts for nearly half of India's final energy consumption in 2025 and is a major source of CO₂, SO₂, and NO_x emissions.

1. Core Technology: Industrial Heat Pumps

I. Mechanism: How IHPs Work

- **Heat Transfer:** Unlike boilers that *generate* heat by burning fossil fuels, IHPs *move and upgrade* low-grade waste heat from one stream to another using electricity.
- **Thermodynamic Cycle:** They utilize a refrigerant cycle involving four main components: an **Evaporator** (absorbs heat), a **Compressor** (increases pressure/temperature), a **Condenser** (releases heat to the process), and an **Expansion Valve**.
- **Simultaneous Heating and Cooling:** IHPs can produce hot water or steam while simultaneously producing chilled water or dehumidified air as a byproduct, making them highly efficient for sectors like food processing.

II. Efficiency and Performance

- **Coefficient of Performance (COP):** This is the ratio of useful heat output to electricity input. IHPs typically have a COP of **3 to 5**, meaning they deliver 3–5 units of heat for every 1 unit of electricity consumed.
- **Energy Savings:** Transitioning from conventional boilers to IHPs can reduce overall energy use by **40–60%** in suitable industrial applications.

2. Significance for India and MSMEs

- **Sectoral Impact:** IHPs are most effective in sectors requiring low-to-medium temperatures, such as **textiles, food processing, chemicals, and pharmaceuticals**.
- **Focus on MSMEs:** Micro, Small, and Medium Enterprises (MSMEs) contribute significantly to industrial emissions (around 17%). IHPs offer a modular and scalable solution for brownfield MSME clusters where replacing large boiler systems is impractical.
- **Public Health:** By displacing on-site coal and biomass combustion, IHPs reduce air pollutants that contribute to respiratory and cardiovascular diseases, potentially mitigating the high rate of premature deaths linked to industrial air pollution.

Q. Industrial heat pumps are most suitably used in which of the following sectors?

1. Food processing
2. Textile industries
3. Paper industry

Select the correct answer using code given below:

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

Answer: D

Explanation:

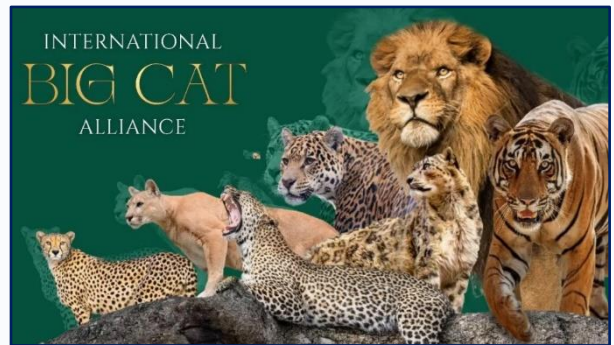
Industrial Heat Pumps (IHPs) are designed to provide low-to-medium temperature process heat, making them highly effective in sectors where thermal requirements match their operating range.

- **Food Processing:** This sector is a primary candidate for IHPs. Many processes, such as pasteurization, drying, and washing, require temperatures within the range that heat pumps can efficiently provide. Furthermore, the food industry often requires simultaneous heating and cooling, which IHPs can deliver as a byproduct.
- **Textile Industries:** Textile units require significant thermal energy for processes like dyeing, washing, and finishing. These processes typically rely on process steam or hot water at low-to-medium temperatures, which are the optimal application zones for IHP technology.
- **Paper Industry:** The paper and pulp industry is heat-intensive, particularly for drying processes. IHPs can be utilized to recover waste heat and provide the necessary thermal energy for drying and other low-temperature pulp processing stages.

4.5. INTERNATIONAL BIG CAT ALLIANCE (IBCA)

Context

Recently, the Union Minister for Environment, Forest and Climate Change launched the website and logo for the **inaugural International Big Cat Alliance (IBCA) Summit**, which India is set to host from **June 1 to 3, 2026**, in New Delhi. The summit, themed **‘Save big cats, save humanity, save ecosystem’**, is expected to witness the participation of 95 countries and culminate in the adoption of the first-ever global declaration on big cat conservation, titled the **‘Delhi Declaration’**.



1. Origin and Launch

- **Launched by:** Prime Minister Narendra Modi on **April 9, 2023**.
- **Occasion:** Commemoration of **50 years of Project Tiger** in Mysuru, Karnataka.
- **Status:** A treaty-based international intergovernmental organization.
- **Headquarters:** **New Delhi, India**.

2. The Seven Big Cats Covered

The alliance focuses on the protection and conservation of seven major big cat species. Out of these seven, **five are found in India** (Tiger, Lion, Leopard, Snow Leopard, and Cheetah).

Species	IUCN Status (General)	Key Fact
Tiger	Endangered	Largest of all wild cats; India holds ~75% of global population.
Lion	Vulnerable	Asiatic Lions are restricted solely to Gir National Park, Gujarat.

Leopard	Vulnerable	Most adaptable; found across diverse habitats in Africa and Asia.
Snow Leopard	Vulnerable	"Ghost of the Mountains"; found in the high-altitude Himalayas.
Cheetah	Vulnerable	Declared extinct in India in 1952; reintroduced in 2022 (Project Cheetah).
Jaguar	Near Threatened	Largest cat in the Americas; famous for the strongest bite force.
Puma	Least Concern	Also known as Cougar or Mountain Lion; found in the Americas.

3. Membership and Governance

- **Eligibility:** Open to **96 range countries** (nations where these cats naturally occur) and non-range countries, intergovernmental organizations, and scientific bodies.
- **Structure:** Consists of a **General Assembly**, a **Council** (7 to 15 members), and a **Secretariat**.
- **Model:** It is modeled on the lines of the **International Solar Alliance (ISA)** and the **Coalition for Disaster Resilient Infrastructure (CDRI)**, positioning India as a global leader in environmental diplomacy.

4. Funding and Objectives

- **Initial Funding:** The Government of India has committed **₹150 crore** for the first five years (2023–2028).
- **Primary Goals:** To curb **illegal wildlife trade** and poaching through transboundary cooperation.
 - Knowledge sharing and capacity building among range countries.
 - Creating a **centralized repository** of successful conservation practices (like India's Project Tiger).
 - Integrating conservation with sustainable local livelihoods.

Q. With reference to the International Big Cat Alliance (IBCA), consider the following statements:

1. It is a treaty-based international organization headquartered in Mysuru, Karnataka.
2. The alliance aims to conserve seven big cats, all of which are naturally found in India.
3. The governance structure of IBCA is modeled after the International Solar Alliance (ISA).

Which of the statements given above is/are correct?

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

Correct Answer: B) 3 only

Solution:

- **STATEMENT 1 IS INCORRECT:** While the alliance was *launched* in Mysuru, its **Secretariat and Headquarters** are established in **New Delhi**.

- **STATEMENT 2 IS INCORRECT:** The alliance covers seven big cats (Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma). However, only **five** are naturally found in India. The **Jaguar and Puma** are native to the Americas and are not found in the wild in India.
- **STATEMENT 3 IS CORRECT:** The IBCA is indeed modeled after India's successful international initiatives like the **International Solar Alliance (ISA)** to provide a platform for global cooperation.

4.6. MELITTOLOGY AND CROSS-POLLINATION IN COMMERCIAL CROPS

Context

A collaborative experiment between the **Khadi and Village Industries Board (KVIB)** and the **Central Bee Research Institute (CBRI), Pune**, was conducted in **Yercaud** (Tamil Nadu). The study examined the symbiotic relationship between honey bee activity and coffee plantation productivity, demonstrating a significant increase in honey yields and potential bean quality.



1. The Experiment Design: Controlled Variables

To measure the impact of pollination, the research divided the plantation into three distinct sections:

- **Self-Pollination Only:** Coffee plants were enclosed to prevent access by bees or other natural pollinators.
- **Natural Pollination:** Plants were left open to all natural agents, including wild bees and wind.
- **Maximized Bee Pollination:** Plants were specifically surrounded by bee-hives to ensure a high frequency of bee-flower interaction.

2. Key Findings

- **Honey Production:** During the one-week blossoming period, honey production effectively **doubled**.
- **Yield Metrics:** Average honey yields from beehives placed near blossoming coffee reached approximately **3 kg to 4 kg** per box, showing a marked increase compared to normal periods.
- **Long-term Outlook:** The study aims to evaluate the **quantity and quality** of coffee seeds (beans) nine months post-blossoming to confirm the benefits of cross-pollination.

3. Scientific Significance

- **Cross-Pollination vs. Self-Pollination:** While many coffee varieties (like *Arabica*) are self-fertile, cross-pollination by bees often leads to higher fruit set, heavier berries, and improved genetic vigor.
- **Ecosystem Services:** This experiment highlights the role of bees as providers of "regulating services" in an ecosystem, which has direct economic benefits for the agrarian economy.
- **Institutional Roles: CBRI (Pune):** A nodal agency for research in apiculture.

- The Khadi and Village Industries Commission (KVIC) is a statutory body established in April 1957 by an Act of Parliament (1956) under the Ministry of Micro, Small and Medium Enterprises (MSME)

4. Required Climate for Coffee

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.

5. Production

- **Traditional regions:** Karnataka, Kerala, Tamil Nadu
- **Non-traditional regions:** Andhra Pradesh, Odisha
- **North Eastern regions:** Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura.
- 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.

Q. With reference to the role of honey bees in coffee cultivation, consider the following statements:

1. Cross-pollination by bees can improve fruit set and berry quality in coffee plantations.
2. Coffee cultivation requires deep, well-drained loamy soil rich in humus.
3. Coffee plants grow best under direct and intense sunlight without shade trees.
4. The Khadi and Village Industries Commission (KVIC) is a statutory body under the Ministry of MSME.

Which of the statements given above are correct?

- (a) 1, 2 and 4 only
- (b) 1 and 3 only

(c) 2, 3 and 4 only

(d) 1, 2, 3 and 4

Answer: A

Explanation:

Statement 1 is correct: As highlighted in the experiment by CBRI and KVIB, cross-pollination by honey bees leads to better fruit set (the transition from flower to berry) and improved genetic vigor. Even in self-pollinating varieties like *Arabica*, bee activity often results in heavier and more uniform berries.

Statement 2 is correct: From a geographical perspective, coffee is a demanding crop. It requires **deep, fertile, and well-drained loamy soil** with a high organic (humus) content. It is typically grown on hill slopes to ensure water does not stagnate, which would otherwise lead to root rot.

Statement 3 is incorrect: Coffee plants are sensitive to direct, intense sunlight and high temperatures. In India, coffee is traditionally grown under a **two-tier mixed shade canopy**. Shade trees (like Silver Oak or Dalbergia) are essential to protect the plants from the midday sun and to maintain a cooler microclimate.

Statement 4 is correct: The **Khadi and Village Industries Commission (KVIC)** was established by an Act of Parliament in 1956. It is a **statutory body** functioning under the **Ministry of Micro, Small and Medium Enterprises (MSME)**. It oversees the "Honey Mission" or the "Sweet Revolution" to promote apiculture as a supplementary income for farmers.

4.7. OIL SPILLS

Context

Recently, the draft Oil Spill Contingency Plan (OSCP) for Kerala highlighted that oil spills are no longer just accidental leaks but complex environmental disasters involving diverse pollutants like **nurdles** and **hazardous chemicals**.



What are Oil Spills?

An oil spill is the release of a liquid petroleum hydrocarbon into the environment, especially the marine ecosystem, due to human activity. It is a form of pollution that involves different types of oil, including crude oil, refined petroleum products (such as gasoline or diesel), or oily refuse.

Primary Causes

1. **Accidental Discharges:** Shipwrecks (e.g., *MSC Elsa 3*), tanker accidents, or pipeline ruptures.
2. **Operational Discharges:** Illegal tank cleaning by ships at sea or runoff from land-based industries.
3. **Blowing Out:** Uncontrolled release from offshore oil and gas wells during drilling.

Behavior of Oil in Water (The "Weathering" Process)

When oil spills into the ocean, it undergoes a series of physical and chemical changes known as **weathering**. This is a critical concept for UPSC Geography and Environment:

- **Spreading:** Oil initially spreads as a thin film called an **oil slick**.

- **Evaporation:** Light components of the oil evaporate into the atmosphere within hours.
- **Emulsification:** The mixing of water into the oil, often creating a thick, mayonnaise-like substance called "mousse," which is much harder to clean.
- **Biodegradation:** Microorganisms in the ocean naturally break down some oil components, though this is a very slow process.
- **Sedimentation:** Heavier components of oil sink to the seafloor, affecting benthic (bottom-dwelling) organisms.

Ecological and Socio-Economic Impacts

- **Hypoxia:** The oil slick blocks sunlight and prevents oxygen exchange between the air and water, leading to "dead zones."
- **Hypothermia in Wildlife:** Oil destroys the insulating ability of fur-bearing mammals (like sea otters) and the water-repellency of a bird's feathers, causing them to die of cold.
- **Toxicity:** Ingesting oil causes kidney and liver damage in fish and marine mammals.
- **Livelihood:** Contamination of fish stocks leads to a collapse in the local fishing economy and tourism.

National Oil Spill Disaster Contingency Plan (NOS-DCP)

- **Origin:** Originally promulgated in 1996 and periodically updated (the latest major revision being in 2024).
- **Mandate:** It provides a proactive institutional framework for responding to oil and **Hazardous and Noxious Substances (HNS)** spills in Indian waters.
- **Tiers of Response:**
 - **Tier 1 (Small):** Handled by the individual port, oil company, or facility (up to 700 tonnes).
 - **Tier 2 (Medium):** Handled at the regional/district level with state assistance (700 to 10,000 tonnes).
 - **Tier 3 (Large):** National-level emergency handled by the Indian Coast Guard (>10,000 tonnes).

Role of the Indian Coast Guard (ICG)

- The ICG is the **Central Coordinating Authority** for combating marine pollution in India's Exclusive Economic Zone (EEZ).
- It functions under the **Ministry of Defence**.
- The ICG maintains dedicated **Pollution Response Vessels (PRVs)** and stockpiles of equipment (like booms and skimmers) at major centers like Mumbai, Chennai, and Port Blair.

Q. In the context of marine pollution, the term "Mousse" refers to:

- a) A type of biological algae that thrives after an oil spill.
- b) A thick, stable emulsion of water-in-oil formed during the weathering process.
- c) The light, gaseous components of petroleum that evaporate immediately.
- d) A specialized mechanical tool used by the Coast Guard to scoop oil.

Answer: b)

Solution:

Option b is Correct: During the weathering of an oil spill, the physical action of waves can mix water into the oil, creating a stable **water-in-oil emulsion** popularly known as "mousse." This substance can contain up to 70% water and is significantly more voluminous and difficult to treat than the original oil.

4.8. INDIA-BANGLADESH BORDER

Context

Recently, India and Bangladesh have witnessed renewed diplomatic tension regarding border management and the repatriation of illegal immigrants. The Government of India issued a formal diplomatic note (Note Verbale) to Dhaka expressing concern over the lack of "actionable response" to over 1,000 requests for nationality verification of suspected illegal immigrants.



1. Geographical Profile

- **Length:** India shares its longest international land border with Bangladesh, spanning approximately **4,096.7 km**.
- **Bordering States:** Five Indian states share this boundary:
 - **West Bengal** (Longest share: ~2,217 km)
 - **Tripura** (~856 km)
 - **Meghalaya** (~443 km)
 - **Mizoram** (~318 km)
 - **Assam** (~262 km)
- **Terrain:** The border is highly porous, consisting of plains, riverine belts (Char lands), hills, and dense forests.

2. Historical & Legal Framework

- **Radcliffe Line:** The boundary was originally demarcated by the Radcliffe Commission during the partition of 1947.
- **Land Boundary Agreement (LBA) 2015:** The **100th Constitutional Amendment Act** was passed to give effect to the 1974 LBA. It involved the exchange of 111 Indian enclaves in Bangladesh and 51 Bangladeshi enclaves in India, effectively resolving a decades-old sovereignty dispute.
- **1975 Border Guidelines:** These guidelines prohibit the construction of "defensive structures" within **150 yards** of the Zero Line. Disputes frequently arise regarding whether "fencing" constitutes a defensive structure.

3. Border Management & Security

- **Border Security Force (BSF):** The primary agency responsible for guarding the India-Bangladesh border.

- **Comprehensive Integrated Border Management System (CIBMS):** Often referred to as "Smart Fencing," it utilizes sensors, thermal imagers, and underground surveillance to monitor unfenced and riverine sections.
- **Border Haats:** These are traditional markets located at the border to promote local trade and people-to-people ties (e.g., Kamalasagar-Tarapur in Tripura).

4. Connectivity & Water Resources

- **Maitri Setu:** A 1.9 km long bridge over the **Feni River**, connecting Sabroom in Tripura to Ramgarh in Bangladesh, providing India's Northeast access to the Chittagong Port.
- **Railway Links:** Operational routes include **Maitree Express** (Kolkata-Dhaka), **Bandhan Express** (Kolkata-Khulna), and **Mitali Express** (New Jalpaiguri-Dhaka).
- **River Disputes:** 54 rivers cross the border. The **Teesta River** remains the most contentious water-sharing issue, while the **Ganga Water Treaty (1996)** is set for renewal in December 2026.

Q. With reference to the India-Bangladesh Land Border, consider the following statements:

Statement-I: West Bengal shares the longest land boundary with Bangladesh among all Indian states.

Statement-II: The 100th Constitutional Amendment Act of India was enacted to facilitate the exchange of enclaves under the Land Boundary Agreement.

Which one of the following is correct in respect of the above statements?

- A) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I.
- B) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I.
- C) Statement-I is correct but Statement-II is incorrect.
- D) Statement-I is incorrect but Statement-II is correct.

Solution:

Correct Option: B

STATEMENT I IS CORRECT: West Bengal shares approximately 2,217 km of the total 4,096 km border, making it the longest.

STATEMENT II IS CORRECT: The 100th Constitutional Amendment (2015) was indeed passed to ratify the 1974 LBA and the 2011 Protocol for the exchange of enclaves.

EXPLANATION: While both are facts related to the border, the legal amendment (LBA) is not the *reason* why West Bengal has the longest boundary; geographical partition in 1947 is the cause.

Therefore, Statement-II does not explain Statement-I.

5.1. DUAL-USE SATELLITES AND INTERNATIONAL SPACE LAW

Context

Recently, discussions on the militarization of space have intensified due to the increasing reliance on commercial satellite constellations for military intelligence and drone targeting, which creates a "legal blindspot" in existing international treaties. Modern orbital conflicts are transitioning from physical destruction to invisible cyber-interference, such as signal loss and deliberate misdirection, as seen in recent global geopolitical tensions.



1. Dual-Use Technology in Space

- **Definition:** Dual-use satellites are those that provide services to both civilian and military sectors simultaneously.
- **Examples:** GPS networks used for civilian navigation also provide high-precision coordinates for missile strikes; broadband constellations like Starlink provide internet to remote areas while supporting military communication networks.
- **Strategic Ambiguity:** Because these assets serve schools or hospitals alongside military kill-chains, they complicate the "principle of distinction" required under international humanitarian law.

2. Cyber-Warfare Tactics in Orbit

- **Jamming:** The process of blocking or interfering with radio signals, preventing the satellite from communicating with ground stations.
- **Spoofing:** Sending false data to a satellite or its users, such as manipulating GPS signals to mislead maritime vessels or aircraft.
- **Ground Station Hacking:** Gaining unauthorized control of satellite systems via the terrestrial infrastructure that manages them.

3. Legal Frameworks and Challenges

- **Outer Space Treaty (1967):** The foundational pillar of international space law which stipulates that space should be used for peaceful purposes.
- **Principle of Distinction:** Requires warring parties to differentiate between civilian objects and military targets, a rule that is increasingly difficult to apply to dual-use constellations.
- **The UN Charter Article 2(4):** Prohibits the "use of force"; however, there is significant debate on whether a non-physical cyber-attack that "bricks" a satellite constitutes a violation of this article.

- **Attribution Gap:** In the digital domain, operations routed through proxy networks make it difficult to identify the perpetrator with evidentiary certainty, complicating traditional deterrence.

4. India's Stance and Initiatives

- **CERT-In/SIA-India Guidelines:** India has institutionalized a "secure-by-design" doctrine for space systems to embed cybersecurity into every stage of a satellite's lifecycle.
- **Capability Building:** India is expanding its presence in orbit to improve the ability to detect, trace, and respond to cyberattacks in real-time.

Q. With reference to the 'Outer Space Treaty of 1967' and modern space security, consider the following statements:

1. The treaty explicitly prohibits the placement of all types of weapons, including conventional missiles, in Earth's orbit.
2. The 'Principle of Distinction' under international humanitarian law requires satellites to be used exclusively for either civilian or military purposes, prohibiting dual use.
3. The 'Attribution Gap' refers to the difficulty in legally identifying the perpetrator of a cyber-interference operation against a satellite.

How many of the above statements are correct?

- A) Only one
- B) Only two
- C) All three
- D) None

Answer: A) Only one

Solution:

- **STATEMENT 1 IS INCORRECT:** While the treaty prohibits placing weapons of mass destruction (WMDs) in orbit and forbids military bases on celestial bodies (like the Moon), it does not explicitly ban all conventional weapons in Earth's orbit.
- **STATEMENT 2 IS INCORRECT:** The Principle of Distinction requires warring parties to differentiate between civilian and military *targets* during a conflict, but it does not prohibit the existence or manufacturing of dual-use technology.
- **STATEMENT 3 IS CORRECT:** The attribution gap is a significant technical and legal challenge where the invisible nature of cyber-disruption makes it hard to prove who launched an attack.

5.2. DIRECTED ENERGY WEAPONS (DEWS)

Context

Recently, Defence Minister Rajnath Singh, while addressing the North Tech Symposium in Prayagraj, underscored the urgent necessity for India to accelerate innovation in high-tech warfare domains. He specifically urged the industry and academia to prioritize the development of emerging



technologies, including **Directed Energy Weapons (DEWs)**, hypersonic systems, and artificial intelligence, to ensure India maintains a strategic edge in a rapidly transforming global security landscape.

1. What are Directed Energy Weapons (DEWs)?

Directed Energy Weapons are a class of technologies that use **concentrated electromagnetic energy** rather than kinetic projectiles (bullets or missiles) to incapacitate, damage, or destroy enemy equipment and personnel. They operate at the **speed of light**, offering near-instantaneous engagement of targets.

2. Types of DEWs

- **High-Energy Lasers (HEL):** These weapons focus intense beams of light to physically burn through a target's hull or destroy sensitive optical sensors (a process known as a "hard-kill").
- **High-Power Microwaves (HPM):** These emit short pulses of microwave energy that penetrate electronic systems to "fry" circuits and disrupt internal electronics without necessarily causing physical structural damage.
- **Particle Beam Weapons:** These use accelerated subatomic particles (electrons or protons) to damage targets, though they remain largely experimental due to massive power requirements.

3. India's Key DEW Projects

Project Name	Type	Key Features
DURGA-II	High-Energy Laser	Standing for Directionally Unrestricted Ray-Gun Array , it is a 100-kW system intended for land, sea, and air platforms to neutralize drones and missiles.
KALI	High-Power Microwave	Standing for Kilo Ampere Linear Injector , it is a linear electron accelerator developed by DRDO and BARC to disrupt enemy satellite and missile electronics.
Project Tri-Netra	High-Energy Laser	Managed by the Laser Science and Technology Centre (LASTEC) for short-range aerial defense.

4. Advantages vs. Challenges

- **Cost-Effectiveness:** A single "shot" from a laser costs only a few dollars (primarily the cost of electricity), compared to millions for an interceptor missile.
- **Logistical Ease:** There is no need for physical ammunition storage; as long as there is power, the weapon has an "infinite magazine."
- **Speed and Precision:** They are unaffected by gravity or wind and can hit hypersonic targets instantly.
- **Challenges:** DEWs are heavily affected by **atmospheric conditions** (fog and rain scatter the beam) and require **massive power sources** and cooling systems.

Q. With reference to Directed Energy Weapons (DEWs), consider the following statements:

1. High-Energy Lasers (HEL) primarily damage targets by disrupting their electronic circuits through electromagnetic interference.
2. The KALI (Kilo Ampere Linear Injector) is an indigenous Indian project developed jointly by DRDO and the Bhabha Atomic Research Centre (BARC).
3. Atmospheric conditions such as heavy fog and rain do not impact the efficacy of Laser-based DEWs due to their high frequency.

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

Solution: (b)

- **STATEMENT 1 IS INCORRECT:** High-Energy Lasers (HEL) damage targets through **thermal effects** (burning/melting), whereas High-Power Microwaves (HPM) are the ones that disrupt electronic circuits.
- **STATEMENT 2 IS CORRECT:** KALI is a linear electron accelerator designed for generating high-power microwaves, developed as a collaboration between DRDO and BARC.
- **STATEMENT 3 IS INCORRECT:** Laser-based DEWs are highly sensitive to **atmospheric attenuation**; particles like water droplets (fog/rain) and dust scatter the light beam, significantly reducing its range and power.

5.3. TARA WEAPON SYSTEM

Context:

Recently, the **Defence Research and Development Organisation (DRDO)** and the **Indian Air Force (IAF)** successfully conducted the maiden flight-trial of the **Tactical Advanced Range Augmentation (TARA)** weapon system off the coast of Odisha on May 7, 2026. This development, marks the arrival of India's first indigenous modular range extension kit designed to transform conventional unguided bombs into high-precision glide weapons.



This development, marks the arrival of India's first indigenous modular range extension kit designed to transform conventional unguided bombs into high-precision glide weapons.

1. Definition and Functional Utility

The **Tactical Advanced Range Augmentation (TARA)** is a glide weapon system designed to convert existing unguided warheads (gravity bombs) into **precision-guided munitions (PGMs)**. It essentially acts as a "modular kit" that can be attached to standard bombs to provide them with guidance and extended range.

2. Key Technical Features

- **Glide Technology:** The system utilizes a modular range extension kit consisting of deployable wings. These wings allow the bomb to "glide" through the air, significantly increasing its standoff distance.

- **Precision Guidance:** By integrating state-of-the-art guidance systems, TARA ensures that low-cost unguided warheads can neutralize ground-based targets with extreme accuracy.
- **Variants:** The system is developed in multiple configurations to suit different payloads, including **TARA 250**, **TARA 450**, and **TARA 500** (corresponding to 250kg, 450kg, and 500kg bomb classes).
- **Low Cost:** A primary objective of the TARA project is to provide a cost-effective solution for precision strikes compared to expensive dedicated missiles.

3. Development and Indigenization

- **Agency:** The system has been designed and developed by the **Research Centre Imarat (RCI)**, Hyderabad, in collaboration with other DRDO laboratories.
- **Industrial Collaboration:** The project involves **Development-cum-Production Partners (DcPP)** and several private Indian industries, ensuring a robust supply chain under the **Atmanirbhar Bharat** framework.
- **Platform Integration:** While initial carriage trials were conducted using **Jaguar** fighter jets, the system is slated for integration with other frontline IAF aircraft like the **Su-30MKI** and **Mirage 2000**.

4. Strategic Importance

- **Standoff Capability:** By increasing the range, TARA allows IAF pilots to release weapons from a distance where they remain safe from enemy Ground-Based Air Defence (GBAD) systems.
- **Lethality and Efficiency:** It enhances the lethality of the existing stockpile of "dumb bombs" by ensuring they hit specific high-value targets rather than causing collateral damage.

Q. With reference to the Tactical Advanced Range Augmentation (TARA) system, consider the following statements:

Statement-I: TARA is a modular range extension kit designed to convert unguided warheads into precision-guided glide weapons.

Statement-II: It has been developed by the Research Centre Imarat (RCI) to provide a low-cost indigenous alternative for the Indian Air Force.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I.
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I.
- (c) Statement-I is correct but Statement-II is incorrect.
- (d) Statement-I is incorrect but Statement-II is correct.

Solution: (a)

- **STATEMENT I IS CORRECT:** TARA is specifically designed as a modular kit that adds wings and guidance to unguided bombs, turning them into glide weapons.

STATEMENT II IS CORRECT: The Research Centre Imarat (RCI), a premier DRDO lab, led the development to enhance strike accuracy at a low operational cost, explaining the functional necessity of the system mentioned in Statement I.

5.4. NATIONAL FRAMEWORK FOR CHILDHOOD DIABETES CARE

Context:

- Recently, the **Union Ministry of Health and Family Welfare** released a comprehensive "Guidance Document on Diabetes Mellitus in Children" during the National Summit on Best Practices in Public Healthcare Service Delivery. This first-of-its-kind national framework aims to integrate the screening, diagnosis, and long-term management of childhood diabetes into India's public health system.



Key Highlights of the Framework

1. Universal Screening and Coverage

- The framework mandates universal health screening for all children from **birth to 18 years of age**.
- Screening will be conducted through community platforms like **Anganwadi Centres** and school-based health programs.
- Mobile health teams will be deployed to identify symptomatic children in educational and childcare settings.

2. Integration with RBSK 2.0

- The government has revamped the **Rashtriya Bal Swasthya Karyakram (RBSK)** into **RBSK 2.0**.
- The original "4Ds" approach—Defects at birth, Diseases, Deficiencies, and Developmental delays—has been expanded to include **Non-Communicable Diseases (NCDs)** like diabetes and hypertension, as well as mental health conditions.

3. The "4Ts" Awareness Framework

To help parents, teachers, and caregivers recognize early warning signs of **Type 1 Diabetes**, the guidelines promote the **4Ts**:

- Toilet:** Frequent urination.
- Thirsty:** Excessive thirst.
- Tired:** Persistent fatigue.
- Thinner:** Unexplained or rapid weight loss.

4. Free Lifelong Care Package

- Confirmed cases are eligible for a **free, comprehensive care package** at public health facilities.
- This package includes **lifelong insulin therapy**, glucometers, test strips, and regular diagnostic monitoring.

- The framework establishes a "continuum of care" by linking community screening with district hospitals and advanced care at medical colleges.

5. Type 1 vs. Type 2 Diabetes

Feature	Type 1 Diabetes	Type 2 Diabetes
Nature	Autoimmune condition ; the immune system attacks insulin-producing cells.	Metabolic/Hormonal disorder ; the body becomes resistant to insulin.
Insulin Production	The body produces no insulin .	The body produces insulin, but cannot use it effectively.
Common Age	Historically called "juvenile diabetes," usually diagnosed in children/teens.	Historically in adults, but increasingly seen in children due to obesity.
Prevention	Currently cannot be prevented .	Can often be prevented/managed through lifestyle and diet .
Treatment	Requires lifelong daily insulin injections or pumps.	Managed with diet, exercise, oral meds, or sometimes insulin.

Q. Consider the following statements regarding the recently released 'Guidance Document on Diabetes Mellitus in Children' and the RBSK 2.0 guidelines:

1. The revised Rashtriya Bal Swasthya Karyakram (RBSK 2.0) focuses exclusively on screening for Non-Communicable Diseases (NCDs) like diabetes and hypertension.
2. The '4Ts' framework is an awareness tool designed to help identify early warning signs of Type 2 Diabetes in adolescents.
3. Under the new framework, the government provides free lifelong insulin therapy and glucometers to children diagnosed with diabetes in public health facilities.

How many of the statements given above are correct?

- A) Only one
- B) Only two
- C) All three
- D) None

Answer: A) Only one

Solution:

- **STATEMENT 1 IS INCORRECT:** RBSK 2.0 does not focus *exclusively* on NCDs; it expands the existing "4Ds" framework (Defects, Diseases, Deficiencies, Developmental delays) to *include* NCDs, mental health, and behavioral conditions.

- **STATEMENT 2 IS INCORRECT:** The '4Ts' framework (Toilet, Thirsty, Tired, Thinner) is specifically highlighted as a tool to recognize the early warning signs of **Type 1 Diabetes**, which often has a sudden onset in children.
- **STATEMENT 3 IS CORRECT:** A key feature of the new framework is the provision of a free, comprehensive care package at public health centers, which includes lifelong insulin, glucometers, and test strips.

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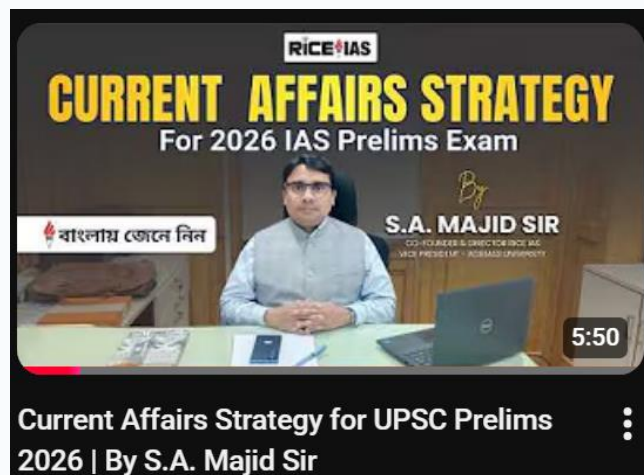
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