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IMPORTANT INSIGHTS

Census 2027: Centre Expands Enumerator Eligibility as Legal Questions Arise over Compulsory Service by Private Citizens

Recent Developments: Census Rules Amended in October 2026

- On **16 October 2026**, the Ministry of Home Affairs amended the **Census Rules, 1990**, through the Census (Amendment) Rules, 2026, expressly including teachers of private educational institutions and employees of private establishments among the categories eligible for appointment as Census enumerators.
- The amendment followed judicial challenges to the compulsory deployment of private-school teachers, including interim protection granted by the Bombay High Court in May 2026 and a stay issued by the Punjab and Haryana High Court in October 2026.
- The central issue concerns the relationship between **administrative necessity, statutory authority and individual rights**: whether the government can compel private individuals to undertake Census duties merely because the amended rules identify them as eligible enumerators.

Understanding the Census Rules Amendment:

What Has Changed?

- The amendment expressly identifies three categories of eligible enumerators: teachers of government, local-authority, aided and unaided private educational institutions; clerks and officials of government departments, local authorities and specified establishments; and any other person considered suitable by the State Government or Union Territory Administration.
- The specified establishments include **public sector undertakings, statutory bodies, banks, companies, institutions, societies and trusts**, thereby expanding the explicitly identified pool of potential Census personnel.
- The amendment was issued under **Section 18(1) of the Census Act, 1948**, which empowers the Central Government to make rules for implementing the Act.

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Why Was the Amendment Needed?

- The earlier Rule 3 already referred to "teachers, clerks or any official or any person," creating an argument that private teachers and employees could be appointed under the existing provision.
- The government sought to remove ambiguity by expressly naming private educational institutions and private establishments, particularly after courts questioned whether the earlier wording permitted compulsory requisition of their staff.
- **Key distinction:** Eligibility for appointment under the rules and the statutory power to compel a person to serve are separate legal questions. Clarifying a person's eligibility does not automatically resolve whether the parent Act authorises compulsory deployment.

Legal Framework under the Census Act, 1948:

Section 4(2): Appointment of Census Officers

- **Section 4(2)** empowers the State Government to appoint persons as Census officers, who are then bound to serve in the capacity for which they are appointed.

- The government can rely on the broad expression "persons" to argue that the power is not confined to government employees.
- The opposing argument is that the scope of compulsory service must be determined by reading the provision alongside the Act's other specific provisions and the limits of delegated legislation.

Section 4A: Obligations of Local Authorities

- **Section 4A** provides a specific mechanism for requiring local authorities to make necessary staff available for Census work when directed by the Central Government.
- This provision establishes an express statutory arrangement for securing personnel from local authorities, distinguishing them from private establishments that do not fall within the same category.

Sections 6 and 7: Assistance from Establishments

- **Sections 6 and 7** provide for assistance connected with Census operations in specified circumstances, including counting persons within establishments and obtaining relevant cooperation.
- In earlier litigation, courts interpreted Section 7(c) narrowly, rejecting its use as a general power to requisition private employees for door-to-door enumeration.
- The government therefore faces a statutory-interpretation question: whether general appointment powers under Section 4(2) can support compulsory service when the more specific provisions impose narrower obligations on particular categories of institutions.

Judicial Developments and Key Precedents:

Bombay High Court, 2026

- In May 2026, the Bombay High Court granted interim protection to more than 500 private unaided and minority schools in Maharashtra against compulsory deployment of their staff for Census duties.
- The court questioned whether Sections 6 and 7 authorised the general requisition of private-school teachers and rejected, at the interim stage, the argument that the expression "any person" in the earlier rules necessarily covered such compulsory deployment.
- The proceedings raised the principle that **subordinate legislation cannot exceed the authority granted by its parent statute**. The amendment subsequently clarified the categories named in the rules, but its effect on the underlying statutory controversy remains distinct from the question of eligibility.

Punjab and Haryana High Court, 2026

- In October 2026, the Punjab and Haryana High Court stayed the operation of Haryana government communications seeking details of private-school teachers for Census duty.
- The challenge concerned the government's authority to requisition teachers from private unaided schools under the existing statutory framework.
- The Centre's subsequent amendment addressed the ambiguity in the enumerator-eligibility rules, but the broader question of compulsory service must still be examined against the Census Act and applicable judicial orders.

Earlier Litigation: LIC Employees and Private-School Teachers

- In the **2010 LIC Jalandhar case**, the Punjab and Haryana High Court quashed an order requiring the Life Insurance Corporation of India to provide 150 employees as enumerators, holding that Section 7(c) did not authorise such a general requisition.

- The court distinguished the restricted assistance contemplated by Section 7(c) from the appointment power under Section 4(2), leaving open the possibility of action under the latter provision.
- In a **2019 Gujarat High Court LIC case**, the court similarly ruled against requisitioning LIC employees under Section 7; the decision has been challenged before the Supreme Court.
- During the **2011 Census**, the Bombay High Court initially protected private-school teachers but subsequently modified its interim directions, permitting deployment before or after school hours, exempting teachers handling Classes X and XII, and allowing school managements to determine which staff could be spared.

Constitutional Dimension: Compulsory Service and Fundamental Rights:

Article 23: Forced Labour and Public Service

- **Article 23(1)** prohibits trafficking in human beings, begar and other similar forms of forced labour, while **Article 23(2)** permits the State to impose compulsory service for public purposes.
- Article 23(2) provides a constitutional basis for compulsory public service in appropriate circumstances, subject to the prohibition on discrimination based only on religion, race, caste or class, or any combination of these grounds.
- However, Article 23(2) does not independently confer a specific Census-requisition power on every government authority. The authority to appoint and compel Census personnel must still be established under the applicable statute.

Comparative Precedents on Compulsory Civilian Service

- In **Dulal Samanta v. District Magistrate, Howrah (1958)**, compulsory appointment of special police officers under the Police Act, 1861, was upheld in the context of Article 23(2), illustrating that compulsory civilian service can be constitutionally permissible when supported by law.
- The **National Service Act, 1972**, which provided for calling up qualified doctors and engineers, illustrates a more elaborate legislative framework involving registration, postponement on hardship grounds, prescribed remuneration and obligations concerning employer release and reinstatement.
- The comparison highlights the importance of clear statutory safeguards, defined duties and fair conditions when public authorities impose compulsory service on individuals outside the regular government workforce.

Administrative Necessity: Why Does the Census Need So Many Enumerators?

- The Census is a large-scale exercise requiring household visits, population enumeration, supervision, verification and timely collection of reliable demographic information, making field personnel indispensable despite increasing digitisation.
- Estimates cited during preparations for Census 2027 indicated a requirement of approximately **34 lakh enumerators and supervisors**, with around **31 lakh personnel reported to be undergoing training** in the figures provided for the exercise.
- Traditionally, Census personnel are drawn substantially from school teachers and government or local-authority employees. However, the availability of suitable personnel varies across regions rather than necessarily reflecting a uniform national shortage.
- Remote, tribal and geographically difficult areas may face staffing constraints even when urban areas have comparatively greater availability. Expanding the eligible pool can therefore improve operational flexibility, provided deployment follows the law.
- **Honoraria and suitable working arrangements** may encourage voluntary participation and reduce reliance on compulsory requisition. The effectiveness of these measures depends on adequate compensation, manageable workloads and timely administrative planning.

Governance Challenges and the Way Forward:

- **Legislative clarity:** Parliament may consider whether the Census Act should explicitly define the categories of persons liable for compulsory service, the circumstances permitting requisition and the safeguards available to affected individuals.
- **Proportionality and fairness:** Authorities should consider exemptions or adjustments for examinations, essential professional responsibilities, health-related difficulties and other demonstrable hardships.
- **Administrative efficiency:** Workforce mapping, interdepartmental coordination, realistic honoraria and targeted recruitment can address regional shortages without relying excessively on coercive measures.
- **Judicial compliance:** Census authorities must comply with operative court orders. The amended rules should not be treated as automatically overriding judicial stays or resolving questions that courts have not finally decided.
- **Digital and institutional support:** Self-enumeration, digital data collection and improved supervisory systems can reduce avoidable field burdens, although they cannot eliminate the need for trained personnel and verification.

Value Addition for UPSC:

GS Paper II: Polity, Constitution and Governance

- **Core constitutional provisions:** Article 23(1), prohibition of forced labour; Article 23(2), compulsory service for public purposes; Section 4(2), appointment of Census officers; Section 4A, assistance by local authorities; Sections 6 and 7, specified assistance connected with Census operations; Section 18(1), rule-making power.
- **Key legal doctrine:** Delegated legislation must remain within the scope of its parent statute. A rule may clarify statutory implementation but cannot independently create a power that the Act does not authorise.
- **Important governance concept:** Administrative necessity must operate within the rule of law. The scale of a public programme does not, by itself, justify disregarding statutory limits or procedural safeguards.
- **Probable Mains question:** "Examine the constitutional and statutory limits on compulsory civilian service in India with reference to the Census Rules Amendment, 2026."
- **Analytical conclusion:** The amendment expands and clarifies the categories of people eligible for Census enumeration. Whether particular private employees can be compelled to serve depends on the proper interpretation of the Census Act, the applicable court orders and the constitutional limits governing compulsory public service.

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Special Executive Magistrates: Recent Protests Reignite Debate over Preventive Powers, Personal Liberty and Executive Accountability

Recent Developments:

- In October 2026, the detention and subsequent release of Cockroach Janta Party (CJP) activists **Saurav Das and Ashutosh Ranka** brought the powers of **Special Executive Magistrates (SEMs)** under renewed scrutiny. The activists were detained following a protest at Jantar Mantar against the **Special Intensive Revision (SIR)** of electoral rolls.
- On 21 October 2026, a Special Executive Magistrate ordered their release after they furnished bonds and undertook to maintain peace and refrain from calling for protests at Jantar Mantar while the site remained

de-notified as a protest venue. A notice to **All India Students' Association (AISA)** president Neha Bora also drew attention to the use of preventive proceedings against protesters.

- The episode revived concerns about the exercise of coercive powers by executive officials, particularly when preventive proceedings result in custody, and raised questions about procedural fairness, proportionality and the separation of executive and judicial functions.

Who Are Special Executive Magistrates?

- **Legal basis:** Section 15 of the **Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023**, permits State Governments to appoint Executive Magistrates or police officers not below the rank of Superintendent of Police, or equivalent, as Special Executive Magistrates for specified areas, periods or functions.
- **Purpose:** SEMs exercise those powers of Executive Magistrates that are specifically conferred on them. Their principal function is preventive, allowing authorities to address an apprehended breach of peace or threat to public tranquillity before it escalates.
- **Delhi-specific arrangement:** The Delhi Police Act, 1978, provides a statutory basis for authorising the Police Commissioner and specified police officers to exercise designated Executive Magistrate powers. The precise authority exercised in a case depends on the applicable law and notification.

SEMs versus Judicial Magistrates:

- **Executive Magistrates and SEMs** operate within the executive-administrative framework and undertake preventive and public-order functions. Their decisions must remain within statutory limits and are subject to judicial review.
- **Judicial Magistrates**, governed by the judicial structure under Section 9 of the BNSS, function within the judiciary and exercise judicial powers, including conducting criminal trials, deciding bail applications within their jurisdiction and imposing sentences as authorised by law.
- **Critical distinction:** SEMs cannot conduct criminal trials or convict a person for an offence merely by exercising their preventive powers. However, statutory preventive proceedings can still result in custody in specified circumstances, making procedural safeguards essential.

Statutory Powers and Procedural Safeguards:

Peace Bonds and Preventive Proceedings:

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- **Section 126, BNSS — Security for keeping peace:** When an Executive Magistrate receives credible information that a person is likely to breach the peace or disturb public tranquillity, the Magistrate may require the person to show cause why a bond or bail bond should not be executed to maintain peace for a period not exceeding **one year**.
- **Sections 130–133 — Initiation and notice:** These provisions govern the formal order, its explanation to the person concerned and the issue of summons or warrants where applicable. The person must be informed of the grounds of the proceedings through the prescribed process.
- **Section 135 — Inquiry into the truth of information:** The Magistrate must inquire into the information underlying the proceedings and may take further evidence. The inquiry should, as far as practicable, follow the procedure for recording evidence in summons cases.
- **Section 135(3) — Interim preventive measures:** During the inquiry, the Magistrate may require a bond or bail bond and order custody until it is furnished or, where it is not furnished, until the inquiry concludes, but only when immediate measures are necessary and reasons are recorded in writing. The provision therefore requires an individualised justification rather than automatic detention.
- **Section 136 — Final security order:** A direction to furnish security must follow the inquiry and be supported by the conclusion that security is necessary. The amount and conditions of the bond must be reasonable and cannot exceed the limits prescribed by the initial order.

- **Section 137 — Discharge:** If the inquiry does not establish the necessity of a bond, the Magistrate must record that conclusion and discharge the person; anyone held only for the inquiry must be released.
- **Section 141 — Imprisonment in default of security or breach of bond:** A person who fails to furnish security as legally required may be committed to prison for the prescribed period. A person who breaches a peace bond may also be arrested and detained under the statutory conditions, provided the Magistrate records the grounds.
- **Section 170 — Preventive arrest by police:** This provision separately authorises police to arrest without a Magistrate's order when the statutory conditions for preventing a cognisable offence are met and the offence cannot otherwise be prevented. It is a police power, not an exclusive power of SEMs.

Judicial Review and Remedies:

- **Challenge to orders:** SEM orders are not immune from judicial scrutiny. Depending on the nature of the order and the remedy available under law, an affected person may approach the appropriate court or statutory authority.
- **Procedural accountability:** A lawful preventive order should identify the relevant apprehension, explain the necessity of the action and demonstrate that the prescribed procedure has been followed. Mechanical orders, unsupported allegations or disproportionate bond conditions can undermine the legality of the proceedings.

Colonial Origins and Constitutional Concerns:

- **Historical continuity:** Preventive peace-bond mechanisms have roots in English law, including the Justices of the Peace Act, 1361. Indian criminal procedure subsequently incorporated similar mechanisms, which continued under the **Code of Criminal Procedure (CrPC), 1973**, and now operate under the BNSS, in force since **1 July 2024**.
- **Separation of powers:** The controversy arises because executive officials can exercise powers affecting personal liberty without functioning as independent judicial officers. Preventive administration is a legitimate state function, but its exercise requires safeguards against arbitrariness.
- **Article 21:** The constitutional guarantee of life and personal liberty requires deprivation of liberty to follow a procedure established by law that satisfies constitutional standards of fairness and non-arbitrariness.
- **Article 19:** Peaceful assembly and expression are constitutionally protected under Articles 19(1)(a) and 19(1)(b), subject to the reasonable restrictions permitted by the Constitution. Preventive action must address a legally relevant threat to public order and should not treat peaceful dissent itself as sufficient proof of an impending breach of peace.
- **Article 22:** Constitutional protections concerning arrest and detention remain relevant where preventive proceedings lead to custody. The precise safeguards depend on the legal basis of the custody; ordinary preventive proceedings should not be confused with preventive detention under a separate law.
- **Article 23:** The prohibition of forced labour is relevant to the broader history of constitutional limits on coercive state power, but it is not the primary constitutional provision governing SEM proceedings. Articles 14, 19 and 21 provide the more direct framework for examining arbitrariness, peaceful protest and personal liberty.

Judicial Interventions: A Recurring Pattern of Concern:

Sunil Batra Case, 1984:

- In **Sunil Batra v. Commissioner of Police, Delhi (1984)**, the Delhi High Court examined complaints of unjustified arrests under the preventive provisions of the CrPC. The records revealed the use of cyclostyled forms that appeared to presume answers rather than record the person's actual responses.

- The Court stressed the need for proper procedure, disclosure of the grounds for requiring a bond and evidence that the Magistrate had applied an independent mind. The case exposed how routine paperwork could undermine safeguards intended to protect liberty.

Delhi High Court Proceedings, 2007–2018:

- In 2007, the Delhi High Court, drawing on earlier judicial reasoning, emphasised that preventive proceedings under the CrPC required recorded statements and reasoned orders rather than mechanical initiation.
- In **2018**, the Delhi High Court again examined preventive proceedings conducted by police officers exercising Executive Magistrate powers. It highlighted the continued use of cyclostyled proformas and raised concerns about the concentration of executive and quasi-judicial functions.
- The Court called for stronger oversight, suggested considering the designation **"Special Executive Officers"** to reduce confusion with judicial magistrates, and raised concerns about the treatment of preventive detainees and the disproportionate burden on economically weaker and marginalised groups who could not furnish sureties.
- The proceedings also highlighted the need for regular scrutiny of continued custody. Any claim about a specific detention limit must, however, be read in the context of the relevant court order and statutory framework rather than treated as a universal rule applicable to every case.

Narmada Bachao Andolan Case, 2007:

- In proceedings concerning the detention of **Medha Patkar and other protesters**, the Madhya Pradesh High Court examined the arrest and detention of people agitating over rehabilitation issues linked to the Sardar Sarovar Project. The case reinforced the importance of due process when the state acts against protest movements.
- The broader principle is that maintaining public order does not remove the obligation to respect lawful protest, follow statutory procedures and provide remedies for unlawful deprivation of liberty.

Key Issues and the Way Forward:

- **Risk of mechanical action:** Repeated judicial criticism of standardised forms and inadequately reasoned orders indicates a need for case-specific assessment, clear recording of evidence and transparent reasons for imposing bonds or custody.
- **Disproportionate impact:** High surety requirements can affect people with limited financial resources more severely. Bond amounts and conditions should reflect the circumstances of the case and comply with statutory limits.
- **Institutional independence:** Where police officers exercise executive-magisterial powers, independent scrutiny is important to reduce the risk that preventive proceedings become an extension of routine policing.
- **Administrative reforms:** Governments should strengthen training, maintain auditable records, establish effective supervisory review and examine independent oversight arrangements. Any change in designation or institutional structure should be supported by legal and administrative reform.
- **Protection of peaceful protest:** Authorities should distinguish peaceful dissent from conduct supported by specific evidence of an imminent breach of peace. Preventive measures should be necessary, proportionate and no more restrictive than required to address the identified risk.

Value Addition for UPSC:

- **GS Paper II — Polity and Governance:** The issue links separation of powers, executive accountability, judicial review, rule of law and the institutional protection of civil liberties.

- **GS Paper II — Constitutional Framework:** Articles **14, 19 and 21** provide a core framework for evaluating arbitrary preventive action, restrictions on peaceful assembly and deprivation of personal liberty; Article 22 is relevant where arrest and custody engage its safeguards.
- **GS Paper II — Judiciary:** The Sunil Batra litigation and subsequent Delhi High Court interventions illustrate the role of judicial review in correcting procedural failures and holding executive authorities accountable.
- **GS Paper IV — Ethics and Public Administration:** SEM proceedings raise questions of impartiality, proportionality, accountability, procedural integrity and the ethical use of coercive state power.
- **Mains-ready conclusion:** Preventive powers can help avert violence and protect public order, but their legitimacy depends on evidence-based action, reasoned orders, proportionate conditions and effective judicial oversight. The constitutional challenge is to prevent genuine public-safety powers from becoming instruments that unnecessarily restrict peaceful dissent or personal liberty.

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Cyclone Arnab Intensifies over the Bay of Bengal, Threatening Andhra Pradesh with Severe Winds, Heavy Rainfall and Coastal Flooding

Recent Developments:

- On **27 October 2026**, **Cyclone Arnab** intensified into a **Very Severe Cyclonic Storm** over the west-central Bay of Bengal, according to the India Meteorological Department (IMD).
- The IMD forecast that the system would move west-northwestwards before turning northwestwards and crossing the **Andhra Pradesh–Yanam coast between Bapatla and Visakhapatnam** by the forenoon of **28 October 2026**.
- The forecast indicated maximum sustained winds of **115–125 kmph**, with gusts reaching **140 kmph**, accompanied by heavy to extremely heavy rainfall, rough seas and possible coastal flooding. The IMD issued a **Red Message** for the Andhra Pradesh and adjoining southern Odisha coasts.
- The approaching cyclone highlights the importance of accurate forecasting, timely evacuation, protection of critical infrastructure and coordination among meteorological agencies, disaster-management authorities and coastal administrations.

What Is a Tropical Cyclone?

- **Definition:** A tropical cyclone is an organised, rotating low-pressure weather system that develops over sufficiently warm tropical or subtropical ocean waters. It is characterised by strong winds, intense rainfall and a circulation directed towards its low-pressure centre.
- **Regional terminology:** The same broad type of weather system is called a **cyclone** in the Indian Ocean and South Pacific, a **hurricane** in the Atlantic and eastern North Pacific, and a **typhoon** in the north-western Pacific.
- **Cyclone Arnab:** Arnab is the first cyclonic storm of the **2026 North Indian Ocean cyclone season**. Its development over the Bay of Bengal illustrates the seasonal risks faced by the eastern coast of India.

Cyclone Arnab: Track and Expected Intensity:

- **Origin and development:** Arnab developed from a depression over the east-central and adjoining south-east Bay of Bengal. It intensified into a deep depression and subsequently a cyclonic storm before strengthening into a very severe cyclonic storm.

- **Location and movement:** The system was reported over the west-central Bay of Bengal, moving towards the Indian east coast. Its forecast track indicated movement west-northwestwards, followed by a turn towards the north-west.
- **Expected landfall:** The forecast placed the likely landfall between Bapatla and Visakhapatnam, close to Yanam, along the Andhra Pradesh–Yanam coast by the forenoon of 28 October 2026.
- **Wind speed:** Maximum sustained winds of 115–125 kmph, with gusts up to 140 kmph, were forecast near landfall. Such winds can uproot trees, damage weak structures, disrupt power supplies and affect road, rail and communication networks.
- **Rainfall and coastal hazards:** Heavy to extremely heavy rainfall may cause flash floods, waterlogging and river flooding. Strong onshore winds and storm surge can inundate low-lying coastal areas, particularly where high tides, poor drainage and vulnerable settlements increase exposure.

How Are Tropical Cyclones Classified?

- The **India Meteorological Department** classifies cyclonic disturbances over the North Indian Ocean according to maximum sustained wind speed. The principal categories are:
  - **Cyclonic Storm:** 62–88 kmph.
  - **Severe Cyclonic Storm:** 89–117 kmph.
  - **Very Severe Cyclonic Storm:** 118–166 kmph.
  - **Extremely Severe Cyclonic Storm:** 167–221 kmph.
  - **Super Cyclonic Storm:** 222 kmph or more.
- The forecast wind range for Arnab straddles the upper end of the severe cyclonic storm category and the very severe cyclonic storm category. The official classification depends on the assessed intensity at the relevant observation time, rather than on the forecast range alone.

How Is a Tropical Cyclone Formed?

Essential Conditions:

- **Warm ocean water:** Sea-surface temperatures of around **26.5°C or higher** over a sufficient depth generally support cyclone development by supplying heat and moisture. Warm water alone is insufficient; atmospheric conditions must also be favourable.
- **Moist and unstable atmosphere:** Warm, moist air rises and condenses, releasing latent heat. This process strengthens upward motion and can deepen the low-pressure system.
- **Low vertical wind shear:** Large changes in wind speed or direction with altitude can disrupt the storm's vertical structure. Relatively low vertical wind shear allows organised convection and circulation to develop.
- **Coriolis force:** The Earth's rotation helps organise the circulation around the low-pressure centre. Tropical cyclones generally do not form directly at the equator because the Coriolis force is too weak there.

Stages of Development:

- **Low-pressure formation:** Warm, moist air rises from the ocean surface, reducing surface pressure and drawing surrounding air towards the developing low-pressure region.
- **Intensification:** Condensation releases latent heat, encouraging further ascent and strengthening the pressure gradient. Increasing pressure differences accelerate winds around the centre.
- **Cyclonic circulation and eye formation:** The Coriolis force organises the inflowing air into rotating circulation. In sufficiently mature and intense cyclones, a relatively calm **eye** may develop, surrounded by the **eyewall**, where the strongest winds and intense rainfall generally occur.
- **Dissipation:** A cyclone weakens after moving over land or cooler waters, encountering dry air or experiencing unfavourable wind shear. These conditions disrupt its supply of heat and moisture and weaken its organised circulation.

Cyclone Naming: Purpose and Significance

- **Naming system:** Tropical cyclones in the North Indian Ocean are named through the regional mechanism coordinated by the **World Meteorological Organization (WMO)** and the **United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)** Panel on Tropical Cyclones.
- **Origin of the name Arnab:** The name was proposed by **Bangladesh** under the regional naming list adopted in 2020. "Arnab" is a Bengali word associated with the sea or ocean, and the IMD gives its pronunciation as "Ornab".
- **Why names matter:** Standardised names help authorities, the media and the public identify a particular storm, distinguish it from other weather systems and communicate warnings more clearly. Names are assigned from a predetermined list; the naming country does not determine where the cyclone will develop or make landfall.

Impact of Cyclones on India:

Economic and Social Consequences:

- **Coastal communities:** High winds, storm surge and flooding threaten lives, houses, fishing settlements and coastal livelihoods. People living in low-lying areas and poorly constructed dwellings face greater exposure.
- **Agriculture and fisheries:** Heavy rainfall and saline inundation can damage standing crops, orchards and agricultural land. Rough seas disrupt fishing activity, damage boats and threaten the safety of fishers.
- **Infrastructure and essential services:** Cyclones can damage roads, bridges, ports, railways, power lines, mobile networks and water-supply systems. Disruptions can delay relief operations and interrupt access to hospitals and markets.
- **Environmental effects:** Coastal erosion, saline intrusion, damage to mangroves and contamination of freshwater sources can create lasting ecological and livelihood challenges.

Disaster Preparedness and Response:

- **Forecasting and early warning:** The IMD monitors cyclone formation, intensity, movement, rainfall and wind conditions through satellites, weather radars, observations and numerical forecasting models. Timely, location-specific warnings enable administrations to prepare before landfall.
- **Evacuation and shelters:** State governments and district authorities should identify vulnerable settlements, evacuate exposed populations when necessary, operate cyclone shelters and ensure safe transport for elderly people, children, persons with disabilities and patients.
- **Protection of essential services:** Authorities should secure electricity and communication networks, maintain emergency medical services, position rescue teams and prepare food, drinking water and essential supplies before the cyclone arrives.
- **Community preparedness:** Public communication should explain warning levels, evacuation routes, shelter locations and safe behaviour. Fishers should follow official advisories and avoid entering dangerous seas.
- **Recovery and resilience:** Post-cyclone priorities include restoring essential services, assessing damage, providing relief and rebuilding infrastructure to withstand future hazards.

India's Institutional and Policy Framework:

- **India Meteorological Department:** The IMD is the national meteorological agency responsible for weather forecasting and cyclone warnings. The **Regional Specialized Meteorological Centre for Tropical Cyclones over the North Indian Ocean**, located in New Delhi and operated by the IMD, provides regional cyclone advisories.

- **National Disaster Management Authority:** The NDMA issues disaster-management guidelines and promotes preparedness, mitigation and coordinated response. State disaster-management authorities and district administrations implement local measures.
- **National Disaster Response Force:** The NDRF supports specialised search, rescue and evacuation operations during major disasters, working with state agencies and other emergency services.
- **Disaster risk reduction:** The **Disaster Management Act, 2005**, provides the institutional framework for disaster management in India. Risk reduction also requires cyclone-resistant infrastructure, effective land-use planning, resilient power and communication systems, and protection of natural coastal barriers such as mangroves.

Value Addition for UPSC:

- **GS Paper I — Geography:** Tropical cyclone formation, the Coriolis force, latent heat, atmospheric pressure, ocean temperature and the geographical vulnerability of the Bay of Bengal coast.
- **GS Paper III — Disaster Management:** Early-warning systems, evacuation, inter-agency coordination, resilient infrastructure, community preparedness and the transition from relief-oriented response to risk reduction.
- **GS Paper III — Environment:** Coastal erosion, saline intrusion, mangrove protection, ecosystem-based adaptation and the growing importance of climate-resilient coastal planning.
- **Key analytical point:** A cyclone's impact depends not only on its intensity but also on its track, rainfall, storm surge, population exposure, infrastructure quality and the speed of the official response.
- **Mains-ready conclusion:** Cyclone Arnab demonstrates the need to integrate scientific forecasting with last-mile communication, timely evacuation and resilient infrastructure. A disaster-resilient coastal strategy must combine reliable early warnings, community participation, ecosystem protection and coordinated governance to minimise loss of life and economic damage.

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India's Defence Sector Advances Aatmanirbharta 2.0 Through Indigenous Production, Advanced Technologies and Resilient Supply Chains

Recent Developments:

- **Aatmanirbharta 2.0:** The Defence Minister has called for a new phase of defence self-reliance focused on advanced technologies, stronger research and development (R&D), and resilient domestic supply chains.
- **Record domestic production:** India's defence production reached **₹1.78 lakh crore in FY 2025–26**, registering **15.6% growth** over ₹1.54 lakh crore in the previous financial year. Defence exports also reached a record **₹38,424 crore**, with Indian equipment exported to more than 80 countries.
- **Growing industrial participation:** Defence Public Sector Undertakings (DPSUs) and other public sector units contributed approximately 76% of production, while the private sector accounted for 24%, indicating an expanding role for domestic industry.
- **Long-term ambition:** India aims to achieve **₹3 lakh crore in defence production by 2029**, shifting from import dependence towards a competitive domestic manufacturing and technology ecosystem.

Overview of India's Defence Sector:

- **Budgetary expansion:** The defence budget increased from ₹2.53 lakh crore in 2013–14 to ₹7.85 lakh crore in 2026–27, supporting military modernisation, domestic manufacturing and technological development.

- **Research and development:** Defence R&D allocation rose from ₹13,716.14 crore in 2014–15 to ₹29,100.25 crore in 2026–27, an increase of more than 112%. Sustained investment is essential for developing technologies that cannot be acquired reliably from foreign suppliers.
- **Changing industrial structure:** Public sector manufacturers continue to provide significant production capacity, while private firms, start-ups and micro, small and medium enterprises (MSMEs) are expanding their participation in components, electronics, aerospace and specialised systems.
- **Strategic objective:** Defence indigenisation means developing and manufacturing equipment, components, materials and technologies within India. **Self-reliance does not require eliminating every import immediately; it requires reducing critical dependencies and acquiring the capacity to design, manufacture, maintain and upgrade essential systems domestically.**

Achievements in Defence Self-Reliance: FY 2025–26

Ammunition and Missile Capabilities:

- **Ammunition indigenisation:** The Indian Army achieved approximately **91% self-sufficiency across 175 ammunition variants**, with 159 variants indigenised. This improves supply assurance and reduces exposure to disruptions in foreign procurement.
- **Strategic missiles:** India successfully tested the **Agni-4 intermediate-range ballistic missile** and the **Agni-5 long-range surface-to-surface ballistic missile**, strengthening indigenous strategic strike capabilities.
- **Precision-strike systems:** The **TARA glide weapon** and **RudraM-II air-to-surface missile** demonstrated indigenous precision-strike capabilities against ground targets. Such systems can reduce dependence on imported weapons and support mission-specific operational requirements.

Air Defence and Emerging Technologies:

- **Integrated air defence:** The Defence Research and Development Organisation (DRDO) has advanced indigenous systems, including the **Kusha long-range air defence missile** and the **Very Short-Range Air Defence System (VSHORADS)**. An integrated system combining missile interceptors, short-range weapons and laser technologies has also been tested.
- **Hypersonic research:** DRDO conducted a 12-minute ground test of an actively cooled scramjet combustor, supporting the development of hypersonic missile technologies.
- **Strategic significance:** Indigenous air defence, propulsion, sensors and precision weapons strengthen the ability to detect, track and counter diverse threats while reducing vulnerability to technology denial and external supply constraints.

Warships and Maritime Surveillance:

- **Naval modernisation:** The Indian Navy commissioned 12 warships and submarines during FY 2025–26, including **INS Surat, INS Nilgiri and INS Vaghsheer**.
- **Indigenous shipbuilding:** The stealth frigate **INS Mahendragiri**, commissioned in July 2026, has more than 75% indigenous content. Its construction involved Indian industries, including MSMEs, and strengthened domestic capabilities in ship design, weapons, sensors and combat systems.
- **Maritime domain awareness: SHACHI**, the first of 11 Next Generation Offshore Patrol Vessels, was launched. INS Dunagiri, INS Sanshodhak and INS Agray also entered service, strengthening maritime surveillance, hydrographic survey and coastal security capabilities.

Why Is Defence Indigenisation Necessary?

- **Strategic autonomy and national security:** Domestic manufacturing reduces dependence on foreign suppliers during wars, geopolitical crises, sanctions or disruptions in international supply chains. It also improves India's freedom to make independent security decisions.
- **Operational readiness:** Indigenous production can improve the availability of ammunition, spare parts and repair services, reduce procurement delays and support faster equipment upgrades. However, these benefits depend on reliable quality and adequate production capacity.
- **Economic efficiency:** Domestic manufacturing can reduce foreign exchange outflows, create skilled employment and support industrial development. Initial development costs may be high, so long-term efficiency depends on economies of scale, sustained demand and lifecycle maintenance.
- **Technology sovereignty:** Indigenous research and intellectual property provide greater control over design, software, critical components and future upgrades. This is particularly important in jet engines, semiconductors, electronic warfare, advanced sensors and autonomous systems.
- **Export competitiveness:** A strong domestic industrial base can expand defence exports, improve economies of scale and strengthen strategic partnerships. Export growth also requires dependable after-sales support, quality certification and compliance with international obligations.

Defence Acquisition and Indigenisation Reforms:

Procurement Framework:

- **Defence Procurement Procedure 2016:** It supported procurement reform and the Make in India approach, providing a foundation for subsequent changes in acquisition priorities.
- **Defence Acquisition Procedure 2020:** It strengthened preferences for domestic procurement and expanded opportunities for Indian firms in defence design, development and production.
- **Draft Defence Acquisition Procedure 2026:** The draft proposes reducing procurement categories from five to four, defining indigenous design more clearly and raising indigenous content from 50% to **60% under the Buy Indian–IDDM category**. These are proposed reforms and should not be treated as implemented provisions unless formally notified.

Indigenisation Lists and Digital Platforms:

- **Positive Indigenisation Lists:** By May 2026, 10 lists—five each issued by the Department of Military Affairs and the Department of Defence Production—covered **5,521 items**. These lists identify items intended for domestic development and procurement, creating opportunities for Indian manufacturers.
- **SRIJAN Defence Equipment Empowerment Platform:** The platform connects defence organisations with domestic suppliers. By May 2026, the SRIJAN DEEP database listed more than **41,000 vendors and 2.7 lakh products**, strengthening supply-chain visibility and domestic sourcing.

Industrial Corridors and Innovation:

- **Defence industrial corridors:** The Uttar Pradesh Defence Industrial Corridor had attracted investment commitments of ₹42,057 crore by April 2026, while the Tamil Nadu Defence Industrial Corridor attracted ₹32,699 crore. The BrahMos integration and testing facility in Lucknow has begun manufacturing missiles.
- **Defence Testing Infrastructure Scheme:** The scheme supports the development of eight greenfield testing and certification facilities. Seven facilities had been approved in areas such as unmanned aerial systems, electronic warfare, electro-optics and communications.
- **Innovations for Defence Excellence:** Launched in 2018, **iDEX** supports start-ups, MSMEs, innovators and academic institutions developing defence and aerospace technologies.

- **Technology Development Fund:** The fund supports domestic defence R&D, particularly by start-ups and MSMEs, helping bridge the gap between laboratory research, prototype development and industrial production.
- **Ease of doing business:** Industrial licence validity has been extended to 15 years, with a possible additional three-year extension. Defence-sector foreign direct investment is permitted up to **74% through the automatic route** and up to **100% through the government route**, subject to applicable conditions.

Key Challenges:

- **Critical technology gaps:** India continues to depend on foreign suppliers for several advanced technologies and components, including aero-engines, specialised semiconductors and certain high-end sensors.
- **R&D and innovation constraints:** Higher allocations do not automatically translate into technological leadership. India needs sustained research funding, advanced testing facilities, stronger university–industry links and greater development of indigenous intellectual property.
- **Procurement uncertainty:** Long acquisition cycles, changing requirements and limited visibility of future orders can discourage private investment. Stable procurement planning and timely payments are essential for industrial scale-up.
- **Quality and production capacity:** Indigenous products must meet stringent reliability, safety and performance standards. Domestic suppliers also need the capacity to manufacture at scale and deliver spare parts throughout a platform's service life.
- **Export barriers:** Global competitiveness requires internationally credible testing, certification, financing, maintenance and training support, alongside compliance with export-control obligations.

Way Forward:

- **Prioritise critical technologies:** Focus national R&D on aero-engines, propulsion, semiconductors, electronic warfare, artificial intelligence, autonomous systems, cyber defence and advanced materials.
- **Deepen public–private collaboration:** Strengthen partnerships among DRDO, DPSUs, private manufacturers, start-ups, MSMEs and academic institutions, with clear milestones for technology transfer and commercialisation.
- **Build resilient supply chains:** Develop multiple domestic suppliers for critical components, strengthen local testing and certification, and reduce excessive dependence on single-source imports.
- **Reform procurement:** Provide predictable multi-year orders, transparent evaluation, timely payments and performance-based acquisition processes while maintaining operational requirements and quality standards.
- **Invest in skills and exports:** Expand specialised training in aerospace, electronics, robotics and advanced manufacturing, while supporting export certification, maintenance networks and long-term international partnerships.

Value Addition for UPSC:

- **GS Paper III — Internal Security:** Defence indigenisation, strategic autonomy, defence manufacturing, technological sovereignty and modernisation of the armed forces.
- **GS Paper III — Science and Technology:** Indigenous R&D, advanced missiles, hypersonic technologies, sensors, artificial intelligence and public–private innovation.
- **GS Paper III — Economy:** Manufacturing-led growth, MSMEs, industrial corridors, employment, exports and import substitution.
- **Analytical takeaway: Aatmanirbharta 2.0 must move beyond increasing the value of domestic production towards mastering critical technologies.** Its success should be assessed through indigenous design capability, reliable supply chains, operational performance, lifecycle support, export competitiveness and reduced dependence on strategically sensitive imports.

NVS-03 Mission Seeks to Restore NavIC's Standalone Positioning Capability and Strengthen India's Indigenous Satellite Navigation System

Recent Developments:

- The **Indian Space Research Organisation (ISRO)** is scheduled to launch the **NVS-03 navigation satellite** aboard the **GSLV-F18 (Mk II)** launch vehicle from Sriharikota, Andhra Pradesh, on 30 October 2026. The mission is intended to strengthen India's indigenous satellite navigation system, **Navigation with Indian Constellation (NavIC)**.
- NavIC's operational capability has weakened because several first-generation satellites have aged or experienced technical failures. According to a July 2026 government statement, only three satellites—**IRNSS-1B, IRNSS-1I and NVS-01**—were providing positioning, navigation and timing services, below the four-satellite minimum required for standalone positioning.
- NVS-03 belongs to the second-generation satellite series and incorporates an indigenous **rubidium atomic clock** and civilian signals in the **L1 frequency band**, alongside L5 and S-band signals. These features are intended to improve reliability and encourage integration into civilian navigation devices.

What Is NVS-03?

- NVS-03 is the third satellite in the second-generation **Navigation Satellite (NVS) series**, designed to replenish and modernise the original Indian Regional Navigation Satellite System satellite constellation. The NVS series is planned to include five satellites—NVS-01 to NVS-05—with an intended mission life of approximately 12 years.
- Its indigenous rubidium atomic clock, developed by ISRO's Space Applications Centre in Ahmedabad, is intended to reduce dependence on imported precision timing components. Atomic clocks provide the accurate time references needed to calculate a receiver's distance from navigation satellites.
- The inclusion of the **L1 civilian signal**, in addition to the existing L5 and S-band signals, is expected to improve compatibility with commercial navigation equipment. However, wider adoption will also depend on receiver-chipset support, device manufacturers and integration costs.
- NVS-03 could strengthen NavIC's ability to provide standalone positioning after successful launch, orbital placement, commissioning and integration into the operational constellation. Its actual contribution will depend on the satellite's final operational status and the availability of the other satellites.

What Is NavIC?

- **NavIC**, formerly known as the Indian Regional Navigation Satellite System (IRNSS), is India's independent regional satellite navigation system developed by ISRO. It provides **positioning, navigation and timing (PNT)** services for civilian, commercial and authorised strategic users.
- Unlike the United States' Global Positioning System (GPS), which provides global coverage, NavIC is designed primarily for India and the region extending approximately **1,500 km beyond the Indian mainland**. Its extended service area reaches a wider region defined by specified geographical limits.
- The system is designed around **seven navigation satellites**—three in geostationary orbit and four in inclined geosynchronous orbit—supported by a ground network of control centres, monitoring stations, timing facilities and ranging infrastructure. Its three principal segments are:
    - **Space segment:** Navigation satellites that transmit timing and ranging signals.
    - **Ground segment:** Infrastructure responsible for satellite control, orbit determination, monitoring and timing.

- **User segment:** Receivers in devices used for navigation, mapping, transport, surveying and other applications.

- NavIC provides two principal services. The **Standard Positioning Service (SPS)** is intended for civilian users, while the encrypted **Restricted Service (RS)** is available to authorised users, including strategic and defence organisations. The SPS is designed to deliver positioning accuracy better than 20 metres and timing accuracy better than 40 nanoseconds at the two-standard-deviation level within the primary service area.

Evolution of NavIC and the Current Satellite Gap:

First-Generation Satellites:

- The first-generation constellation comprised the **IRNSS-1 series**, including satellites 1A, 1B, 1C, 1D, 1E, 1F and 1G, launched between 2013 and 2016. These satellites were designed for an approximately 10-year mission life.
- IRNSS-1H failed to reach its intended orbit in 2017 because of a heat-shield separation failure, but IRNSS-1I was successfully launched in 2018 as a replacement. Several older satellites subsequently experienced atomic-clock failures, reached the end of their design life or became unavailable for full navigation services.

Second-Generation NVS Satellites:

- **NVS-01**, launched in May 2023, was the first second-generation satellite and carried an indigenous atomic clock. It continues to provide operational navigation services.
- **NVS-02**, launched in January 2025, reached its intended transfer orbit, but a propulsion-system valve failure prevented the satellite from completing the required orbit-raising manoeuvres. ISRO's review identified a likely problem involving the electrical connection to the oxidiser-line pyro valve, leading to corrective measures for subsequent missions.
- **NVS-03, NVS-04 and NVS-05** form part of the planned replenishment programme. Timely deployment is necessary to improve constellation redundancy and reduce the risk of service interruptions.

Why Four Satellites Matter:

- A conventional satellite-navigation receiver generally requires signals from **at least four satellites** to calculate three-dimensional position—latitude, longitude and altitude—while correcting for the receiver's clock error.
- With only three satellites providing full PNT services in the government's July 2026 assessment, NavIC could not provide standalone positioning. Its timing service remained functional, and users could continue using multi-constellation receivers that combine signals from NavIC and other navigation systems.
- This distinction is important: a reduced constellation does not mean that every NavIC service has stopped. Timing, limited messaging capabilities and use alongside other satellite-navigation systems may continue even when standalone positioning is unavailable.

Why Is NavIC Strategically Important?

- **Strategic autonomy:** NavIC was conceived partly in response to the denial of assured access to GPS during the 1999 Kargil conflict. An operational indigenous system reduces dependence on foreign navigation infrastructure during geopolitical crises and supports national security requirements.
- **Defence and critical infrastructure:** Reliable navigation and timing support military operations, transport, telecommunications, surveying and other systems that depend on accurate location or synchronised time. Resilience requires adequate satellite coverage, secure signals and dependable ground infrastructure.

- **Civilian applications:** NavIC can support road transport, maritime navigation, emergency alerts, mapping, agriculture, logistics and location-based services. Wider availability in smartphones and other consumer devices would help translate public investment in space infrastructure into everyday benefits.
- **Maritime and international relevance:** NavIC has received recognition as a component of the **World-Wide Radio Navigation System** under the International Maritime Organization framework. It can support maritime safety and navigation, while regional coverage offers opportunities for cooperation with neighbouring countries.
- **Domestic technology development:** Indigenous atomic clocks, receiver chipsets and navigation-message authentication can reduce reliance on foreign components and strengthen India's broader space and electronics manufacturing ecosystem.

Major Concerns Regarding NavIC:

- **Satellite reliability and continuity:** Ageing satellites, atomic-clock failures and the NVS-02 orbit-raising anomaly have exposed the need for stronger redundancy, dependable propulsion systems and a predictable satellite replacement schedule.
- **Dependence on foreign components:** Critical technologies such as precision clocks, semiconductor components and specialised receiver hardware can create supply-chain vulnerabilities. Domestic manufacturing must therefore extend beyond satellite assembly to essential components and associated software.
- **Electronic warfare threats:** Navigation signals can be disrupted through **jamming**, which interferes with reception, or **spoofing**, which transmits deceptive signals that may mislead a receiver. Secure signal design, authentication, interference monitoring and resilient receivers are essential, particularly for strategic users.
- **Limited civilian adoption:** Global manufacturers often prioritise GPS and other widely supported navigation systems because of their established user base and economies of scale. NavIC adoption therefore depends on affordable compatible chipsets, clear technical standards and incentives for domestic manufacturers.
- **Delayed ecosystem development:** The development of consumer receivers and integration into devices must proceed alongside satellite deployment. Otherwise, the operational life of satellites may be consumed before the civilian ecosystem achieves widespread adoption.

Measures Needed to Strengthen NavIC:

- **Ensure continuity of launches:** ISRO should complete the planned NVS deployment programme, maintain sufficient operational satellites and incorporate lessons from the NVS-02 anomaly into future mission design and testing.
- **Indigenise critical technologies:** Indigenous atomic clocks, navigation processors, receiver chipsets and secure signal-processing systems should be developed and qualified for operational use, reducing exposure to foreign technology restrictions.
- **Expand the user ecosystem:** Government agencies and industry should encourage NavIC-compatible receivers in smartphones, transport tracking devices, maritime equipment and other civilian applications through interoperability standards and domestic manufacturing support.
- **Improve resilience against interference:** Navigation-message authentication, anti-jamming capabilities, spoofing detection and multi-constellation receiver designs should be strengthened to improve service reliability in contested environments.
- **Pursue regional cooperation:** India can promote NavIC-based services and technical cooperation with neighbouring and partner countries, while exploring interoperability with systems such as Europe's Galileo and Japan's Quasi-Zenith Satellite System.
- **Plan long-term development:** India should prioritise reliable regional coverage, service continuity and commercial adoption before treating global expansion as an immediate objective. Any broader coverage ambitions would require sustained investment, technical planning and a clearly defined policy framework.

Value Addition for UPSC:

- **GS Paper III — Science and Technology:** Satellite navigation, atomic clocks, geosynchronous orbits, indigenous semiconductors, navigation-message authentication and space technology applications.
- **GS Paper III — Internal Security:** Strategic autonomy, military navigation, electronic warfare, jamming, spoofing and secure positioning and timing services.
- **GS Paper III — Economy:** Domestic electronics manufacturing, commercial space applications, innovation, supply-chain resilience and reduced dependence on imported technology.
- **Analytical takeaway: NVS-03 is important not merely as another satellite launch but as part of the effort to restore a reliable, independent navigation capability.** Long-term success depends on dependable satellites, indigenous critical components, secure signals, affordable receivers and widespread civilian integration. The effectiveness of NavIC should therefore be assessed through operational continuity, positioning accuracy, resilience and actual user adoption—not simply the number of satellites launched.

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QUESTIONS

1. Which of the following statements correctly capture the constitutional framework of compulsory public service in India?

(1) Article 23(2) permits the State to impose compulsory service for public purposes.

(2) Compulsory service under Article 23(2) cannot discriminate solely on grounds of religion, race, caste, or class.

(3) Article 23(2) acts as a self-executing provision that allows executive orders to compel service without a supporting statute.

(4) In Dulal Samanta (1958), compulsory civilian appointment under statutory police law was held constitutionally valid under Article 23(2).

Select the correct answer using the code given below:

(A) 1 and 3 only

(B) 1, 2, and 4 only

(C) 2 and 4 only

(D) 1, 2, 3, and 4

2. Consider the following statutory provisions of BNSS, 2023 and their corresponding subject matter:

Statutory Provision	Subject Matter
1. Section 15	Appointment of Special Executive Magistrates
2. Section 126	Security for keeping peace and public tranquillity
3. Section 137	Formal discharge of person when no necessity for bond is established
4. Section 170	Judicial Magistrate's power to conduct criminal trials

How many of the above pairs are correctly matched?

(A) Only one pair

(B) Only two pairs

(C) Only three pairs

(D) All four pairs

3. Given below are two statements, one labeled as Assertion (A) and the other as Reason (R):

Assertion (A): Tropical cyclones rarely form within 5° North or South of the Equator.

Reason (R): When Pressure Gradient Force (PGF) pushes air toward a low-pressure zone, the Coriolis force deflects it.

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

(A) Both A and R are correct and R is the correct explanation of A.

(B) Both A and R are correct but R is NOT the correct explanation of A.

(C) A is correct but R is incorrect.

(D) A is incorrect but R is correct.

4. Consider the following statements regarding naval indigenisation efforts:

Statement-I: INS Mahendragiri, a Nilgiri-class stealth frigate, incorporates over 75% indigenous content in its construction.

Statement-II: The Project 17A stealth frigate program serves as a flagship blueprint for India's Aatmanirbhar Bharat initiative.

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 explains Statement-I.

(B) Both Statement-I and Statement-II are correct but Statement-II does NOT explain Statement-I.

(C) Statement-I is correct but Statement-II is incorrect.

(D) Statement-I is incorrect but Statement-II is correct.

5. With reference to the operational architecture and orbital mechanics of the Navigation with Indian Constellation (NavIC), consider the following statements:

(1) NavIC's satellite constellation is composed exclusively of satellites placed in Geostationary Earth Orbits (GEO) to ensure continuous coverage over the Indian subcontinent.

(2) The Standard Positioning Service (SPS) transmitted by NavIC provides encrypted positioning and timing services intended for general civilian applications.

(3) The encrypted Restricted Service (RS) of NavIC is accessible only to authorized users, including strategic and defense organizations.

(4) NavIC provides a global service area identical in geographical coverage to the United States' Global Positioning System (GPS).

How many of the above statements are correct?

(A) All four

(B) Only three

(C) Only two

(D) Only one

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ANSWER KEY

1 – Answer (B), 2 – Answer (C), 3 – Answer (B), 4 – Answer (A), 5 – Answer (D)

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