

THE PALA

CIVIL TIMES

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Shift to computer-based NEET-UG 2027 still under ‘active consideration’, Govt. tells SC
: Examining proposed reforms to NEET-UG, including the shift to computer-based testing.

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Punjab’s Drug Crisis and the Need for a New Drug Policy
: Punjab’s persistent drug crisis grows on the limitations of an enforcement-led approach.

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Balancing deep-sea discovery with environmental stewardship
: India’s growing deep-sea exploration and seabed-mining capabilities should focus on the ecological risks.

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IA homegrown innovation ecosystem is taking root
: Examining India’s evolving innovation ecosystem, including rising patent activity, deep-tech and indigenous technologies

Editor’s Note

Another day, another edition of the Pala Civil Times. This edition focuses on a diverse set of themes covering important national, economic and strategic developments. We begin with the National Eligibility cum Entrance Test (NEET-UG) and the ongoing efforts to reform the examination system, with a focus on strengthening its security and institutional framework. We also examine Punjab’s persistent drug crisis and the factors underlying its deep-rooted nature. Our decoded editorials turn to the EPFO wage ceiling and the latest U.S. sanctions, exploring their implications for India’s social-security and economic systems. We further look at India’s growing ambitions in deep-sea exploration and the ecological concerns associated with expanding activity in the ocean. In the economic section, we examine India’s emerging innovation ecosystem, with particular attention to developments in deep-tech, space technology and semiconductor manufacturing. Each topic has been curated to help learners develop a comprehensive and well-rounded understanding of contemporary developments and their wider implications. We hope this edition serves as a useful resource for thoughtful reading, revision and preparation. All the best, and happy reading!

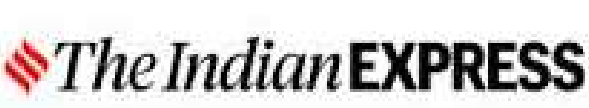
Editorials Decoded

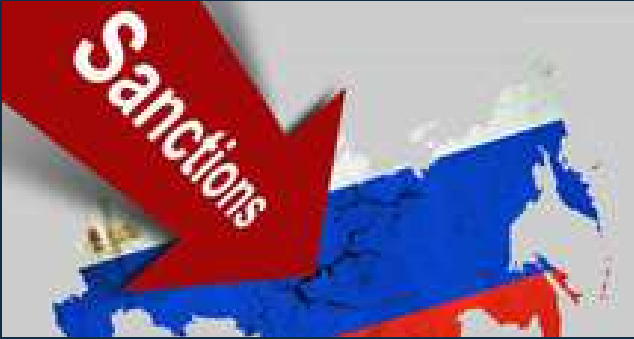




No Hard Ceilings

Examining the increase in the EPFO wage ceiling and its implications for employee coverage, retirement savings, pension contributions and social security.





US sanctions policy — on India and beyond — is reckless and blunt

Examining the U.S. Graham sanctions law, its potential impact on countries buying Russian energy, and the implications for India’s energy security and strategic autonomy.

Shift to computer-based NEET-UG 2027 still under 'active consideration', Govt. tells SC

Following the 2026 NEET-UG paper leaks, the Union government told the Supreme Court that shifting NEET-UG from the written format to computer-based testing (CBT) is under active consideration.

Present Scenario

CBT Consideration: The government is considering shifting NEET-UG 2027 from the written examination format to CBT mode to strengthen examination security and reduce the possibility of paper leaks.

Task Force: A High-Powered Task Force chaired by Infosys co-founder **Nandan Nilekani** has been examining technological reforms to make NTA-conducted examinations more secure.

Pending Decision: Although the NTA had earlier indicated that it was ready to introduce CBT from the next examination cycle, the government and NTA are now awaiting the Nilekani task force's recommendations before taking a final decision.

Timeline: The task force was expected to submit its report by the end of September 2026, with the Supreme Court directing it to file an affidavit within two weeks.

Background : Earlier attempts to reform NEET

2026 Leaks: The NEET-UG 2026 paper leaks affected nearly 23 lakh students, eventually leading to the resignation of the then Education Minister.

Earlier Recommendation: In May 2026, an NTA affidavit stated that a High-Level Committee of Experts (HLCE) had recommended shifting examinations to CBT mode.

Ministerial Involvement: The NTA had proposed implementing the transition in consultation with the Ministry of Health and Family Welfare, the Ministry responsible for NEET-UG.

Multiple Committees: Alongside the Nilekani task force, an earlier High-Powered Steering Committee (HPSC) headed by Dr. K. Radhakrishnan was constituted to examine systemic problems in the conduct of NEET-UG.

Supreme Court's Concerns

Implementation Gap: The Supreme Court questioned when the recommendations of the various committees would actually be implemented on the ground rather than remaining at the committee stage.

Institutional Stability: The Court emphasised that NTA requires permanent offices and a stable workforce to build institutional capacity and ensure continuity.

Permanent Staff: At least half of the NTA workforce should consist of permanent employees rather than officials working on deputation.

Specialisation: Senior leadership should include officials from diverse specialised services, while domain experts should be consulted to strengthen examination-related functions.

Institutional Restructuring

Functional Verticals: NTA is transitioning from exam-specific units to functional verticals to develop specialised capabilities.

Specialist Recruitment: Open recruitment is underway for specialists in security, human resources and research and development.

Leadership: The NTA's leadership has been strengthened with a Secretary-level Director-General, while senior leadership includes officials from the IAS, IPS and other Central services.

Institutional Memory: Greater permanent staffing and specialised leadership are intended to preserve institutional knowledge even when deputed officials are transferred.

Institutional Memory:

Greater permanent staffing and specialised leadership are intended to preserve institutional knowledge even when deputed officials are transferred.

Way Forward

A nationwide CBT system for a large examination such as NEET-UG requires adequate technological infrastructure, trained personnel and secure examination centres. Therefore, the central concern is to move from recommendations and committees to actual institutional reforms before the next examination cycle.

PYQ COMPASS



Q. What are the aims and objects of the recently passed and enforced, The Public Examination (Prevention of Unfair Means) Act, 2024? Whether University/State Education Board examinations are also covered under the Act? (GS II - 2024)

Punjab's Drug Crisis and the Need for a New Drug Policy

The launch of the 'Nasha Mukht Punjab Yatra' has renewed attention on Punjab's persistent drug crisis and the effectiveness of its predominantly enforcement-led approach to drug control.

Scale of the Crisis

Drug Use: A 2023 Parliamentary Panel estimated around 66 lakh people using drugs in Punjab, including approximately 6.97 lakh children aged 10–17 years with some form of substance use disorder (SUD).

Drug Deaths: Punjab reported 266 drug-related deaths between April 2020 and March 2023, placing it among the States with significant drug-related mortality.

Treatment Burden: According to figures reported by the State Assembly, around 6.2 lakh people were in government-run treatment centres, while approximately 6.12 lakh were in private treatment facilities.

Border Location: Punjab's location along the Pakistan border makes it vulnerable to cross-border drug trafficking and complicates efforts to control supply.

Current Approach

Enforcement Focus: Drug control in Punjab has increasingly adopted a securitised and enforcement-led approach, relying heavily on policing and criminal-justice measures.

Health Measures: Government efforts have also included treatment, rehabilitation and preventive education, but these measures have operated alongside a predominantly punitive framework.

Limited Outcomes: The continued prevalence of drug use, addiction and drug-related deaths has raised questions about whether enforcement alone can address the underlying causes of drug demand and dependence.

Human Rights: Concerns have also been raised about abuse and inadequate conditions in de-addiction centres and jails, highlighting the need for stronger safeguards for people affected by substance dependence.

Changing Drug Market

Synthetic Opioids: The emergence of synthetic opioids such as fentanyl in heroin supplies has increased the risk of overdoses and potentially fatal drug consumption.

Early Warning: The absence of an effective early-warning drug monitoring system makes it difficult to identify changes in drug composition, supply and emerging health risks quickly.

Drone Trafficking: Drug traffickers are increasingly using drones to move substances across the Pakistan border. More than 200 drones were seized in 2024, reportedly twice the number seized the previous year.

Women's Involvement: Investigations have indicated growing participation of women in the illegal drug economy, particularly in economically deprived areas with limited legal employment opportunities.

Policy Concerns

Ad-Hoc Strategy: Punjab's drug policy combines criminal-justice and health-based approaches but has been criticised for lacking a consistent, evidence-based long-term framework.

Political Pressure: The urgency of the drug problem creates pressure for governments to demonstrate immediate action, which can favour highly visible enforcement measures over slower public-health interventions.

Demand Reduction: Preventive education and other demand-reduction initiatives have not sufficiently prevented addiction and drug-related harms.

Root Causes: Drug dependence is connected not only to drug supply but also to unemployment, social vulnerability, inadequate treatment and limited opportunities, requiring interventions beyond policing.

PYQ COMPASS



Q. Can the constitutional mandate of rights-based welfare be effectively realised in the context of non-integrated governance and minimal public investment? Examine (GS II - 2026)

Q. "In contemporary development models, decision-making and problem-solving responsibilities are not located close to the source of information and execution, defeating the objectives of development." Critically evaluate. (GS II - 2025)

Balancing deep-sea discovery with environmental stewardship

India is expanding its deep-sea exploration and seabed-mining capabilities, raising an important question about whether technological ability should automatically lead to commercial exploitation of deep-ocean resources.

India's Deepsea footprint

ISA Contracts: India holds three International Seabed Authority (ISA) exploration contracts covering about 95,000 sq km in the international seabed area across the Central Indian Ocean Basin, Central Indian Ridge and Carlsberg Ridge.

Mineral Resources: Exploration has identified an estimated 366 million tonnes of polymetallic nodules containing nickel, copper, cobalt and manganese.

Deep Ocean Mission: Under the Deep Ocean Mission, India is developing deep-sea mining technologies, underwater robotics and the MATSYA-6000 human submersible.

Mining Technology: The National Institute of Ocean Technology has tested a seabed-mining machine at depths of around 5,270 metres, demonstrating India's growing technological capacity.

Biodiversity Research: Surveys across 19 seamounts have studied around 1,300 deep-sea organisms, including nearly 23 species reported as new to science.

Exploration, not mining

Instead of asking only how mining can be carried out with minimum environmental damage, India could first ask whether mining is necessary at all.

The Ecological Concern

Unknown Ecosystems: The deep ocean remains a poorly understood ecosystem. The discovery of previously unknown species highlights the limits of current scientific understanding.

Irreversible Damage: Large-scale seabed mining could physically disturb deep-ocean ecosystems, while its long-term ecological consequences remain difficult to predict.

Precaution: The lack of complete ecological knowledge strengthens the case for more scientific research before irreversible intervention, rather than treating technological capability as sufficient justification for extraction.



Strategic Need vs Ecological Limits

Critical Minerals: Polymetallic nodules contain minerals that may have strategic importance for India's renewable energy, electric mobility and advanced manufacturing ambitions.

Necessity Test: Strategic importance should not automatically become ecological permission. Before extraction, India should examine whether the minerals are genuinely necessary at the proposed scale.

Alternatives: Dependence on seabed minerals can potentially be reduced through recycling, resource efficiency, substitution, lower demand and a circular economy.

India's investment in exploration does not necessarily require a commitment to commercial exploitation. Exploration can generate knowledge, establish environmental baselines and improve biodiversity understanding without proceeding to mining.

PYQ COMPASS



Q. Which of the following statements about Rare Earth Elements (REEs) and Critical Minerals is/are correct? (2026)

1. Modern technological innovations including Artificial Intelligence, robotics and space exploration extensively utilise Rare Earth Elements (REEs).
2. China has the highest share in mining of REEs followed by India.
3. The Government of India launched the National Critical Mineral Mission (NCMM) in 2025 to establish a robust framework for self reliance in the critical mineral sector.
4. Rare Earth Elements are a set of 13 metallic elements.

Select the answer using the code given below:

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

See page 9 for answer

No Hard Ceilings

The Union Cabinet has approved raising the wage ceiling for mandatory EPFO coverage from ₹15,000 to ₹25,000 per month, a revision made after 12 years.

What has changed?

- The earlier wage ceiling of ₹15,000, fixed in September 2014, has been increased to ₹25,000.
- The move is expected to bring more than 51 lakh additional employees under mandatory EPFO coverage.
- Workers earning between ₹15,000 and ₹25,000 will gain access to social-security benefits linked to EPF, Employees' Pension Scheme (EPS) and Employees' Deposit Linked Insurance Scheme (EDLI).
- EPFO currently has around 7.98 crore contributing members across about 7.68 lakh establishments.

Why is the revision significant?

The government links the increase to rising wages, higher incomes and expansion of formal employment. A higher ceiling can widen access to retirement savings, pension and insurance benefits and strengthen social-security coverage among formally employed workers.



How will contributions change?

For employees, the EPF contribution is 12% of wages. With the new ceiling, an employee earning ₹25,000 could contribute up to ₹3,000 per month, compared with ₹1,800 under the ₹15,000 ceiling.

For employers:

- 3.67% goes towards EPF.
- 8.33% goes towards EPS.
- The EPS contribution ceiling will rise from ₹1,250 to ₹2,082.50 per month.
- 0.5% is contributed towards EDLI and another 0.5% towards administrative charges.

The government's annual contribution to EPS is expected to rise to around ₹11,339 crore, from about ₹10,250 crore.

Major Concerns

Delay in revision: The ceiling was last revised in 2014, leading trade unions to argue that the increase has come too late.

Impact on take-home pay: Since employees contribute 12%, the higher ceiling can increase their mandatory contribution. Trade unions have therefore argued that employers should not adjust their additional statutory contribution against existing employee wages.

Burden on employers: Employers, particularly MSMEs, may face higher labour costs. There is concern that excessive additional costs could discourage formal employment.

Implementation issues: Some employers may resist the additional contribution, requiring effective enforcement by the government.

What remains : The unresolved pension issue

The EPS minimum pension remains ₹1,000 per month, an amount fixed in 2014. Around 45% of nearly 82 lakh pensioners reportedly receive ₹1,000 or less.

The Joint Parliamentary Standing Committee on Labour, in March 2026, called for an urgent and comprehensive review of the minimum pension, particularly in view of rising healthcare and living costs.

The broader issue is therefore not only expanding EPFO coverage but also ensuring that the existing pension system provides adequate retirement security.

PYQ COMPASS



Q. Which principle among the following was added to the Directive Principles of State Policy by the 42nd Amendment to the Constitution? (2017)

- Equal pay for equal work for both men and women
- Participation of workers in the management of industries
- Right to work, education and public assistance
- Securing living wage and human conditions of work to workers

US sanctions policy — on India and beyond — is reckless and blunt

The Lindsey O. Graham Sanctioning Russia and Iran Act of 2026 has become law after President Donald Trump signed it on September 18, giving the U.S. President authority to impose tariffs on major buyers of Russian energy, including India and China.

What is the Graham Bill?

Tariff Power: The law authorises tariffs of up to 100% on the five largest purchasers of Russian oil and natural gas, potentially affecting major buyers such as India and China.

Russian Goods: It also authorises tariffs of up to 500% on Russian-origin goods, subject to specified exceptions.

Iran Sanctions: The Iran Sanctions Act of 1996 has been extended until 2031, maintaining U.S. secondary sanctions related to specified transactions involving Iran.

Presidential Discretion: The tariffs are not automatically imposed. The law gives the U.S. President significant discretion over whether and how to apply the measures, including available exceptions and waivers.

Why India is concerned?

Russian Oil: India is a major purchaser of Russian crude, making it potentially vulnerable to the secondary tariff mechanism.

Energy Security: Russian crude has become an important component of India's diversified energy sourcing. Restrictions on access could increase the cost or complexity of securing alternative supplies.

Strategic Autonomy: The issue also intersects with India's principle of maintaining independent foreign-policy choices, including the ability to conduct energy trade based on national requirements.

Trade Impact: If tariffs are imposed on Indian goods, Indian exporters to the U.S. could face higher costs and reduced competitiveness. The precise impact depends on the products targeted, tariff rates and implementation decisions.

U.S Rationale

Pressure on Russia: The legislation is intended to increase economic pressure on Russia over the Russia-Ukraine conflict by targeting its energy revenues and countries that continue purchasing Russian energy. (Reuters)

Secondary Pressure: Instead of restricting only Russian trade, the law creates a mechanism to pressure third countries purchasing Russian energy, thereby increasing the economic cost of continuing such transactions.

Iran: The legislation simultaneously maintains and extends the U.S. sanctions framework against Iran.

Possible Economic Effects

Oil Markets: If major Russian oil buyers are pushed towards alternative suppliers, additional demand could enter an already constrained global oil market, potentially affecting energy prices.

Indian Exports: Higher U.S. tariffs could affect Indian exporters, particularly if the measures cover a broad range of products. The ultimate impact depends on how the administration exercises its tariff authority.

Energy Costs: Reduced access to Russian crude could require India to source more oil from alternative suppliers, potentially increasing procurement costs depending on global prices and availability.

Trade Negotiations: The legislation adds another layer of complexity to India-U.S. trade relations, particularly because energy purchases and market access are now interconnected.

Economic Impact on India

The law authorises tariffs of up to **100%** on the five largest purchasers of Russian oil and natural gas, potentially affecting major buyers such as India and China.

PYQ COMPASS



Q. Which of the following items of defence hardware is/are manufactured in India? (2026)

1. Su-30 MKI Fighter Jets
2. T-90 MK-III Tanks
3. Akula Class Submarine

Select the answer using the code given below:

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

(See page 10 for answer)

A homegrown innovation ecosystem is taking root

India is increasingly moving from importing technologies to developing them domestically, with public research institutions, corporate R&D and deep-tech startups emerging as the three major pillars of this transition.

The Innovation Landscape

Patent Growth: Patent filings increased from just over 1.10 lakh in 2024–25 to more than 1.43 lakh in 2025–26, registering a 30.2% rise. Domestic applicants now account for nearly 70% of filings.

Patent Gap: Despite rising filings, India had just over 2.40 lakh patents in force in 2025, compared with 5.7 million in China, 3.5 million in the U.S. and 2.1 million in Japan based on 2024 data.

Commercialisation: The gap between patent applications and patents in force points to possible low grant rates, abandonment and weak commercialisation. Patent filings alone therefore do not fully capture innovation capacity.

Three Emerging Pillars

Public Research: Government-supported institutions are producing long-gestation technologies in areas such as semiconductors, defence and space, creating foundational capabilities that can later move into commercial applications.

Corporate R&D: Private-sector R&D spending exceeded the combined R&D spending of all levels of government for the first time in 2024 and is expected to account for 55% in 2025–26.

Deep-Tech Startups: Indian startups are increasingly moving beyond conventional service platforms towards deep technology.

Space to healthcare

Space Technology: Pixxel Space is developing hyperspectral imaging technology, with six satellites in orbit and plans for a constellation of 18–24 satellites.

Launch Technology: Skyroot Aerospace and Agnikul Cosmos are developing indigenous launch technologies.

CAR-T Therapy: ImmunoACT, incubated at IIT Bombay in partnership with Tata Memorial Centre, developed NexCAR19, India's first indigenous CAR-T cell therapy. It has expanded access to advanced cancer treatment at around one-tenth of typical treatment costs.

AI Healthcare: Remidio Innovative Solutions, supported at an early stage by BIRAC, is using smartphone-based retinal imaging and AI to help detect conditions such as diabetic retinopathy and glaucoma.

R&D Spending in India

India spends just under 1% of GDP on R&D, compared with around 2.4% in China and 3.5% in the U.S., indicating the need for greater investment in research and technological development.

GaN Technology

Domestic Capability: In March 2023, DRDO scientists at the Solid State Physics Laboratory (SSPL) and Gallium Arsenide Enabling Technology Centre (GAETEC) announced a breakthrough in producing Gallium Nitride (GaN) monolithic microwave integrated circuits (MMICs).

Strategic Importance: GaN technology is important for advanced radar, defence systems, space applications and next-generation communications.

Technology Transfer: DRDO is transferring GaN-based High Electron Mobility Transistor (HEMT) MMIC technology for applications including 5G/6G infrastructure, electric-vehicle chargers and renewable-energy inverters.

Global Position: India is among seven countries reported to have mastered this technology, alongside China, France, Germany, Russia, South Korea and the U.S.

What lies ahead

India needs standardised terms for transferring intellectual property created through publicly funded research into industry and startups. Greater patent-examiner capacity is needed to process the growing volume of applications efficiently.

PYQ COMPASS



Q. Which of the following statements with regard to genetic medicine is/are correct? (2026)

1. Genetic medicines correct/compensate for the faulty genes responsible for disease.
2. Engineered viruses and lipid nanoparticles are used as carriers of the genetic medicine.
3. Genetic medicines alter the entire DNA sequence.

Select the answer using the code given below:

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

INDIA DEEP TECH ALLIANCE (IDTA)

The India Deep Tech Alliance (IDTA) announced that its members had invested ₹2,170 crore in 56 Indian deep-tech firms over the previous year, highlighting growing private-sector support for India's deep-tech ecosystem.

What is Deep Tech?

Deep technology refers to innovations rooted in substantial scientific research or advanced engineering that seek to solve complex problems or create breakthrough technologies. Unlike conventional startups that may focus on incremental improvements to existing products or services, deep-tech ventures generally work on fundamental scientific or engineering challenges and require longer research and development cycles.

What makes Deep Tech different?

- Science and engineering intensive: Deep-tech ventures are built around advances in areas such as artificial intelligence, quantum technology, biotechnology, robotics, space and advanced energy technologies.
- Long R&D cycles: These ventures often require 5–10 years of research and development before their technologies become commercially viable.
- High upfront investment: Significant capital is often required before the technology generates revenue because the primary challenge is developing and validating the underlying technology.
- Lab-to-market transition: The central challenge is converting scientific discoveries or advanced engineering solutions into commercially viable products and services.

Venues for Deep-Tech Applications

Deep-tech ventures can include technologies such as:

- Quantum processors based on advances in quantum science.
- Synthetic biology for applications such as sustainable agriculture.
- Fusion energy technologies.
- Advanced space technologies and launch systems.
- AI-based scientific applications, including technologies capable of solving complex biological or engineering problems.

BRAIN BOOSTERS

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Did You Know?

INDIA DEEP TECH ALLIANCE

Why in News? The India Deep Tech Alliance (IDTA) announced that its members had invested ₹2,170 crore in 56 Indian deep-tech firms over the previous year.

- IDTA is an industry-led alliance of Indian and U.S. investors that mobilises capital and expertise for India-domiciled deep-tech companies.
- It is an independent, industry-led initiative, with members retaining autonomy over their investment decisions.
- At launch, IDTA members committed more than \$1 billion towards India's next generation of deep-tech startups.
- The capital is expected to be deployed largely over 5–10 years, reflecting the long development cycles of deep technologies.
- Energy and climate received more than 30% of the investment, with 8 firms receiving ₹655 crore.

What is India Deep Tech Alliance (IDTA)?

- The India Deep Tech Alliance (IDTA) is an industry-led alliance of leading U.S. and Indian investors that seeks to mobilise capital and expertise to build India-domiciled deep-tech companies.
- It provides a platform through which investors and corporate partners can:
- Share investment pipelines and technical knowledge.
- Conduct technical due diligence.
- Co-invest in promising deep-tech companies.
- Provide capital, mentorship and network access to Indian startups and scale-ups.
- Engage government stakeholders through a unified channel on matters related to the RDI Scheme.

IDTA and the RDI Scheme

The Government of India has approved the Research, Development and Innovation (RDI) Scheme with a ₹1 lakh crore corpus to support and scale strategic technologies.

The IDTA is an independent, industry-led initiative that seeks to complement the RDI Scheme by coordinating private-sector investment, technical expertise and industry participation.

- There is no single IDTA fund or central investment vehicle.
- Independent investment decisions: Individual member firms retain full autonomy over their funds, investment strategies and decisions.
- Shared collaboration: Members can share pipelines, conduct technical due diligence and co-invest.

PYQ Compass



Q. Which of the following statements about Rare Earth Elements (REEs) and Critical Minerals is/are correct? (2026)

1. Modern technological innovations including Artificial Intelligence, robotics and space exploration extensively utilise Rare Earth Elements (REEs).
2. China has the highest share in mining of REEs followed by India.
3. The Government of India launched the National Critical Mineral Mission (NCMM) in 2025 to establish a robust framework for self reliance in the critical mineral sector.
4. Rare Earth Elements are a set of 13 metallic elements.

Select the answer using the code given below:

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

Ans : a – 1 and 3 only

REEs are essential in producing specialized components such as microchips, sensors, and high performance magnets that are widely used in advanced technologies. China holds the largest share in global REE mining; however, countries such as the United States or Australia generally rank next, rather than India. The Government of India launched the National Critical Mineral Mission (NCMM) in 2025 to create a strong framework for self-reliance in the critical minerals sector. Rare Earth Elements actually comprise 17 metallic elements, including the 15 lanthanides along with scandium and yttrium.

Q. Which principle among the following was added to the Directive Principles of State Policy by the 42nd Amendment to the Constitution? (2017)

- (a) Equal pay for equal work for both men and women
- (b) Participation of workers in the management of industries
- (c) Right to work, education and public assistance
- (d) Securing living wage and human conditions of work to workers

Ans : b

The principle of "Participation of workers in the management of industries" was added to the Directive Principles of State Policy by the 42nd Amendment Act, 1976. This principle, enshrined in Article 43A, emphasizes fostering industrial democracy and promoting harmony between employers and workers.

PYQ Compass



Q. Which of the following items of defence hardware is/are manufactured in India? (2026)

1. Su-30 MKI Fighter Jets
2. T-90 MK-III Tanks
3. Akula Class Submarine

Select the answer using the code given below:

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

Ans : a

India has increasingly emphasized domestic defence manufacturing through technology transfer agreements and strategic collaborations with partner countries, **particularly Russia**. Public sector undertakings such as Hindustan Aeronautics Limited (HAL) and defence manufacturing units have played a major role in indigenous production of advanced military systems.

Su-30 MKI Fighter Jets: Su-30 MKI multirole air superiority fighter aircraft are manufactured in India under a licensed production arrangement by Hindustan Aeronautics Limited (HAL).

T-90 MK-III Tanks: T-90 main battle tanks, commonly referred to as Bhishma tanks, are produced in India at the Heavy Vehicles Factory in Avadi under a technology transfer and licensed manufacturing agreement with Russia.

Akula Class Submarine: Akula-class nuclear-powered submarines have not been manufactured in India. These submarines have been leased from Russia and operated by the Indian Navy under the name INS Chakra.

Q. Which of the following statements with regard to genetic medicine is/are correct? (2026)

1. Genetic medicines correct/compensate for the faulty genes responsible for disease.
2. Engineered viruses and lipid nanoparticles are used as carriers of the genetic medicine.
3. Genetic medicines alter the entire DNA sequence.

Select the answer using the code given below:

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

Ans : C

Genetic medicines are therapeutic agents that work by correcting, compensating for, or silencing faulty genes responsible for diseases. Examples include gene therapy, antisense oligonucleotides, and RNA interference therapies. Engineered viruses (viral vectors like adeno-associated viruses) and lipid nanoparticles (used in mRNA vaccines and therapies) serve as delivery vehicles or carriers for genetic medicines.

PRACTICE QUESTIONS

Q.) With reference to India's Deep Ocean Mission, consider the following statements:

1. MATSYA-6000 is being developed as a human-occupied submersible capable of carrying three people to a depth of 6,000 metres.
2. Deep Ocean Mission includes activities related to deep-sea mining, underwater robotics and exploration of marine biodiversity.
3. The mission is concerned exclusively with extraction of mineral resources from the seabed.

Which of the statements given above is/are correct?

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

Ans: (a) 1 and 2 only

MATSYA-6000 is designed to carry three aquanauts to 6,000 metres. The Deep Ocean Mission has multiple components, including deep-sea mining technology, underwater robotics, biodiversity conservation, ocean exploration, climate services and marine biology.

Q) Consider the following statements regarding deep-sea exploration:

1. Polymetallic nodules found on the ocean floor can contain economically important minerals such as manganese, nickel, copper and cobalt.
2. Technological capability to extract seabed minerals necessarily establishes that their commercial exploitation is environmentally sustainable.
3. Deep-sea mineral exploration can have ecological implications because seabed disturbance may affect marine ecosystems.

Which of the statements given above is/are correct?

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

Ans: (c) 1 and 3 only

Polymetallic nodules contain several commercially important minerals. Deep-sea extraction can disturb seabed ecosystems, making environmental assessment and sustainability important. Technological feasibility by itself does not establish environmental sustainability.