

Day 1-20, 100 Topics, UPSC PRELIMS 2026

Today's 5 topics:

1. The concept of 'Day Zero' in United Nations environmental reports.

2. International Space Station (ISS).

3. Di-Ethylene Glycol (DEG).

4. Blocking Glycolysis to Stop Fungal Invasion.

5. Sodium-ion batteries over Lithium-ion batteries.

Now we will see important explanations and questions.

The concept of 'Day Zero' in United Nations environmental reports.

What is Day Zero that UN warns Earth is headed to?

Day Zero is not just a water problem. It can easily trigger public health emergencies, food supply disruptions, power shortages, and social unrest.

What "Day Zero" signifies?

The term "Day Zero" has increasingly entered global conversations around water security, climate change, and urban resilience.

It refers to the moment when a city or region's water supply falls so low that water taps are turned off, forcing authorities to ration water through emergency collection points.

The United Nations (UN) has repeatedly warned that without urgent reforms, *Day Zero scenarios could become more frequent, putting millions of people, including in India, at risk.*

Day Zero, however, is rarely caused by a single drought year, according to the 2023 UN World Water Development Report.

Instead, it emerges from long-term overuse of water, weak governance, rapid urban expansion, and climate-driven shifts in rainfall patterns that hurt the recharge of water sources.

Q1. With reference to the term "Day Zero", recently seen in global discussions, consider the following statements:

1. It refers to the day declared by the United Nations when global freshwater reserves are officially exhausted.
2. It denotes the point at which a city's municipal water supply is shut off due to critically low reservoir levels.
3. It is primarily associated with Sustainable Development Goal (SDG) 6.

Which of the statements given above is/are correct?

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

Answer: 2 and 3.

“Day Zero” is not an officially declared UN date; it is a conceptual warning term.

International Space Station (ISS)

Q1. With reference to the International Space Station (ISS), consider the following statements:

1. It is placed in a Geostationary Earth Orbit.
2. It completes more than one revolution around the Earth in a single day.
3. It experiences microgravity conditions due to continuous free-fall around the Earth.

Which of the statements given above are correct?

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

Solution: a

ISS is in Low Earth Orbit (~400 km), not GEO.

Q2. With reference to the International Space Station, which of the following space agencies are partners in the programme?

1. NASA
2. Roscosmos
3. European Space Agency
4. ISRO

Overview

✓ The Space Station was officially given approval by President Reagan and a budget approved by the US Congress in 1984. NASA Administrator James Beggs immediately set out to find international partners who would cooperate on the program. Canadians, Japanese and many nations of the European Space Agency began to participate in the program soon after.

The Station was designed between 1984 and 1993. Elements of the Station were in construction throughout the US, Canada, Japan, and Europe beginning in the late 1980s.

In 1993, as the Station was undergoing a redesign, the Russians were invited to participate.

Q3. ISS lies within the thermosphere of the Earth?

The thermosphere is the fourth major layer of Earth's atmosphere, extending from about **80 km** to anywhere between **500 km and 1,000 km** (depending on solar activity). Since the ISS orbits at an average altitude of **400–420 km**, it sits comfortably in the middle of this layer.

Q4. Private space companies have transported astronauts to the ISS?

Yes, as of February 2026, private space companies have not only transported astronauts to the International Space Station (ISS) but have become the primary means of transport for NASA.

Currently, SpaceX is the only private company actively and regularly transporting both government and private astronauts. Boeing has also flown astronauts to the ISS in a test capacity, and several other companies are preparing to join the "taxi service" to orbit.

Di-Ethylene Glycol (DEG)

In late 2025, India faced a significant regulatory crisis involving DEG contamination:

1. The "Coldrif" Tragedy: An outbreak of Acute Kidney Injury in children in Madhya Pradesh and Rajasthan was traced to a cough syrup named Coldrif (manufactured by Sresan Pharmaceuticals).
2. Contamination Levels: Lab tests found levels as high as 48.6% DEG, compared to the permissible limit of just 0.1%.
3. WHO Alert: In October 2025, the World Health Organization (WHO) issued Medical Product Alert No. 5/2025, flagging contaminated batches of Coldrif, Respifresh TR, and ReLife syrups.
4. Regulatory Reform: Following this, the Indian government mandated strict compliance with Revised Schedule M (Good Manufacturing Practices) by December 31, 2025, requiring mandatory raw material testing for DEG/EG.

Read this:

Understanding DEG

DEG is a simple organic chemical belonging to the glycol family, with the formula $(\text{HOCH}_2\text{CH}_2)_2\text{O}$. It is a colourless, odourless, slightly viscous liquid with a faintly sweet taste. It mixes easily with water and alcohol, does not evaporate quickly, remains stable over a wide temperature range, and is inexpensive to manufacture. These properties make it an excellent industrial solvent. DEG mimics safer pharmaceutical solvents such as glycerine or propylene glycol. From an unscrupulous manufacturer's perspective, DEG is far cheaper than glycerine or propylene glycol, which costs more, requires better sourcing, and demands quality control. In poorly-regulated environments, DEG becomes a convenient substitute that reduces production costs without visibly altering the final product.

Q1. With reference to Di-Ethylene Glycol (DEG), consider the following statements:

1. It is commonly used as a pharmaceutical solvent for oral medicines.
2. It has a sweet taste and is highly toxic if ingested.
3. It is used in antifreeze and industrial solvents.

Which of the above statements is/are correct? I won't always give you option. Treat every sentence as a question.

Only statement 1 is incorrect:

DEG is prohibited for use as a pharmaceutical solvent in oral medicines due to its extreme toxicity. The safe and "common" solvents for oral syrups are Glycerin or Propylene Glycol.

In several mass-poisoning cases (like the 2025 Coldrif tragedy), unethical manufacturers illegally substituted Glycerin with DEG because it is significantly cheaper and possesses similar solvent properties. However, its presence in medicine is considered a lethal contaminant, not a standard ingredient.

Blocking Glycolysis to Stop Fungal Invasion

The article talks about the discovery by CSIR–CCMB scientists that fungal metabolism—particularly glycolysis-linked sulphur amino acid production—plays a crucial role in enabling fungi to shift from harmless yeast form to invasive filamentous form, highlighting metabolism as a promising new target for antifungal therapies.

Fungal infections are among the most underestimated health threats worldwide, contributing to rising hospitalizations and deaths. Beyond human health, fungi also **devastate crops**, reduce yields, and worsen food insecurity — creating a dual crisis for both public health and agriculture.

Now, researchers at the CSIR–Centre for Cellular and Molecular Biology (CCMB) in Hyderabad have uncovered a significant insight into how fungi become dangerous in the first place. Their findings point to a promising new pathway for developing antifungal therapies by targeting fungal metabolism rather than only gene networks.

Q1. Consider the following statements.

Assertion (A): Targeting fungal glycolysis may reduce the virulence (the severity or harmfulness of a pathogen) of certain pathogenic fungi.

Reason (R): Glycolysis provides sulphur-containing amino acids necessary for invasive filament formation.

Codes:

- 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

Here is the breakdown in simpler terms:

1. The Two "Avatars" of Fungi:

Fungi are like shape-shifters. They have two forms:

The Yeast Form: This is the "travel mode." It's a tiny, oval shape that floats around your body looking for a place to stay. It's relatively harmless and easy for your immune system to kill.

The Filamentous Form: This is the "attack mode." It grows long, hair-like roots (filaments) that drill into your tissues. This form is aggressive and very hard to kill.

2. The "Fuel" (Glycolysis)

To change from travel mode to attack mode, the fungus needs a lot of energy and specific building blocks. It gets these by breaking down sugar—a process called Glycolysis.

3. The "Short Circuit" (The Discovery)

Scientists used to think the fungus changed shape just because its "brain" (genes) told it to. But CCMB found a hidden link:

When the fungus eats sugar very fast, it creates Sulfur-based amino acids. These amino acids act like the bricks and mortar needed to build those dangerous attack-filaments.

No sugar breakdown = No sulfur bricks = No attack mode.

Putting it all together (A-R Logic)

Assertion (A): If we block sugar breakdown, the fungus becomes weak (less virulent).

Reason (R): This is because sugar breakdown is what creates the "bricks" (sulfur amino acids) the fungus needs to grow its "drills" (filaments) and attack us.

The Link: Therefore, (R) explains (A) perfectly. By taking away the kitchen (glycolysis), the fungus can't bake the bread (amino acids) it needs to grow big and strong.

Sodium-ion batteries over Lithium-ion batteries

Rethinking battery strategy in India: the case for sodium-ion technology

India's dependence on lithium-ion batteries exposes structural constraints linked to critical minerals, import dependence, and supply security; sodium-ion batteries emerge as a safer alternative with lower material risk, compatible with existing infrastructure, and the potential to strengthen energy security

As of early 2026, Sodium-ion (Na-ion) batteries have transitioned from a laboratory curiosity to a major commercial alternative to Lithium-ion (Li-ion). This shift is driven primarily by the need for supply chain security and lower costs, especially in the wake of the 2025 lithium price fluctuations.

Why Sodium?

Sodium (Na) belongs to the same group in the periodic table as Lithium (Li), meaning they share similar chemical properties. However, Sodium offers distinct advantages:

- Abundance:** Sodium is 300 times more abundant than Lithium. It can be harvested from common salt (NaCl), whereas Lithium is concentrated in a few geographic regions (the "Lithium Triangle").
- Cost:** Na-ion cells are roughly 20–40% cheaper to produce.
- Safety:** They are less prone to "thermal runaway" (fire) and can be discharged to 0 Volts for safe transport, unlike Li-ion batteries which must maintain a charge to avoid damage.
- Aluminum Anodes:** In Li-ion, copper is needed for the current collector. In Na-ion, cheaper aluminum can be used for both electrodes because Sodium does not alloy with aluminum.

The Challenges: Energy Density

The primary drawback is that Sodium ions are larger and heavier than Lithium ions.

- Weight:** Na-ion batteries have a lower energy density (typically 140–160 Wh/kg) compared to high-end Li-ion (250+ Wh/kg).
- Size:** They are physically bulkier for the same amount of power.
- Application:** This makes them less ideal for high-performance smartphones or long-range EVs, but perfect for stationary grid storage and short-range urban electric vehicles (e-scooters and budget EVs).

In the 2025-26 fiscal year, the Indian government's **National Mission on Transformative Mobility and Battery Storage** began prioritizing Na-ion for "Made in India" batteries.

Q. With reference to '**Sodium-ion (Na-ion) Battery**' technology, consider the following statements:

- Sodium-ion batteries utilize aluminum foil for both the cathode and the anode, unlike Lithium-ion batteries which require copper.
- The energy density of Na-ion batteries is currently higher than that of Lithium-Cobalt-Oxide (LCO) batteries, making them ideal for high-end smartphones.
- Na-ion batteries can be fully discharged to zero volts for transport without degrading the battery chemistry.
- The process of "intercalation," where ions move between the anode and cathode, is absent in Sodium-ion technology.

How many of the above statements are correct?

- Only one

- b. Only two
- c. Only three
- d. All four

Answer: B (Only two — Statements 1 and 3 are correct)

Statement 1 is Correct: This is a major cost-saving factor; Sodium doesn't react with aluminum at low potentials, whereas Lithium does.

Statement 2 is Incorrect: Na-ion has lower energy density than Li-ion (LCO/NCM). It is not the first choice for slim smartphones but for large-scale storage.

Statement 3 is Correct: This is a major safety advantage for shipping and logistics.

Statement 4 is Incorrect: Na-ion batteries do use intercalation (the "rocking-chair" principle), just like Li-ion. The ions simply move in and out of the crystal structure of the electrodes.

Day 2, 5-topic series, UPSC PRELIMS 2026.

6. LOX-Methane engine (Liquid Oxygen and Methane)

7. What are "Molecular Donuts"?

8. Space Weather forecasting: New research by IIT Kanpur

9. Subsidence of River Deltas' in India

10. Central Pay Commission

Now learn topics and solve question:

LOX-Methane engine (Liquid Oxygen and Methane)

A LOX-Methane engine (Liquid Oxygen and Methane) represents the next frontier in rocket propulsion. While traditional rockets often use Kerolox (Kerosene + LOX) or Hydrolox (Liquid Hydrogen + LOX), the space industry—led by SpaceX (Raptor engine) and Blue Origin (BE-4)—is shifting toward Methane (CH₄).

In 2025-26, the focus has intensified on these engines due to their pivotal role in deep-space exploration and reusability.

Q. With reference to '**LOX-Methane**' rocket engines, consider the following statements:

1. Methane engines are considered 'cleaner' than Kerosene engines because they do not produce carbon soot during combustion, facilitating easier engine reusability.
2. Methane and Liquid Oxygen have widely different storage temperatures, requiring highly complex thermal insulation compared to Hydrolox engines.
3. ISRO is developing a LOX-Methane engine specifically for its Next-Generation Launch Vehicle (NGLV).

How many of the above statements are correct?

- a. Only one
- b. Only two
- c. Only three
- d. All four

Why LOX-Methane? (The Advantages)

1. **Soot-Free Performance:** Unlike kerosene, which leaves "coke" (carbon deposits) inside the engine, methane burns extremely clean. This makes the engine much easier to refurbish and reuse multiple times.
2. **In-Situ Resource Utilization (ISRU):** Methane can be manufactured on Mars. This means a rocket can land on Mars and "refuel" for the return journey using the Martian atmosphere.
3. **Temperature Compatibility:** Liquid Methane (\$111\$ K) and Liquid Oxygen (\$90\$ K) have similar boiling points. This allows for simpler tank designs (common bulkheads) and reduces the complex insulation needed when compared to Liquid Hydrogen (\$20\$ K).
4. **Density & Efficiency:** Methane is denser than Hydrogen (requiring smaller tanks) and more efficient (higher Specific Impulse) than Kerosene.

ISRO tests thrust chamber for LOX-Methane Engine

The test was conducted at the Thrust Chamber Test facility at ISRO Propulsion Complex (IPRC), Mahendragiri on January 27, 2026

What are "Molecular Donuts"?

IIT-Gn team builds precise sieve for industry with molecular 'donuts'

The find is significant because accurate separation is essential to purify water, capture carbon, and to manufacture certain medicines

UPSC has a trend of asking about "Materials in News" (like Graphene, Carbon Nanotubes, or Metal-Organic Frameworks) and their practical applications in solving national challenges like water scarcity or pollution.

This research by the IIT Gandhinagar (IIT-Gn) team represents a major breakthrough in membrane science and nanotechnology. They have successfully created a highly precise sieve using a unique class of materials called **Macrocycles, specifically nicknamed "Molecular Donuts."**

Why is this Significant? (Industrial Use-Cases)

1. **Water Purification:** It can remove specific micropollutants, heavy metals, or salts (desalination) more efficiently than current RO (Reverse Osmosis) membranes, which often require high pressure and energy.
2. **Carbon Capture:** The sieve can be tuned to separate CO_2 molecules from other gases in industrial chimneys, helping to mitigate climate change.
3. **Pharmaceutical Manufacturing:** Many life-saving drugs exist as "isomers" (molecules with the same formula but different shapes). These molecular donuts can be designed to "recognize" and separate the beneficial version of a drug from the inactive or harmful one.

Q1. The '**Macrocyclic Molecular Sieves**' recently developed by researchers at IIT Gandhinagar are best described as:

- a. A new class of biological enzymes designed to break down microplastics in marine ecosystems through active digestion.
- b. An ultra-precise filter using tiny, donut-shaped molecules that can clean water and trap carbon by sorting out individual atoms.
- c. A series of synthetic soil additives used to increase the cation exchange capacity in the alkaline soils of the Deccan Plateau.
- d. Specialized carbon nanotubes developed to enhance the energy density of Sodium-ion batteries for deep-space applications.

Space Weather forecasting: New research by IIT Kanpur

This research from IIT Kanpur is a major breakthrough in Space Weather forecasting. Predicting solar cycles is notoriously difficult because the Sun's internal magnetic "engine" (the dynamo) is incredibly complex.

IIT-Kanpur team develops new way to predict solar cycles

For decades, solar physicists have used computer simulations called dynamo models to understand how the sun generates its magnetic field

The team has developed a new model that can more accurately predict the intensity and timing of Solar Cycles, which are roughly 11-year periods of sunspot activity.

What is a Solar Cycle?

The Sun goes through a cycle where its magnetic field completely flips (the North and South poles trade places).

Solar Maximum: The middle of the cycle, where sunspot activity, solar flares, and Coronal Mass Ejections (CMEs) are at their peak.

Solar Minimum: The beginning and end of a cycle, where the Sun is relatively quiet.

The IIT Kanpur Innovation

Traditional models often rely on historical data alone, which can be inconsistent. The IIT Kanpur team used a combination of Kinematic Dynamo Models and Data Assimilation:

- A. **The "Memory" Effect:** They identified how the magnetic field from previous cycles "lingers" and influences the next one.
- B. **Predicting Solar Cycle 25:** Their model helps refine the current understanding of Solar Cycle 25 (which we are currently in) and provides a blueprint for predicting Solar Cycle 26.
- C. **Importance:** Accurate predictions help protect satellites, power grids, and GPS systems on Earth, which can be "fried" by intense solar storms.

Q1. Consider the following statements.

Assertion (A): Developing precise models to predict solar cycles is a priority for national space agencies like ISRO.

Reason (R): Solar flares and CMEs during solar maxima can increase atmospheric drag on Low Earth Orbit (LEO) satellites, causing them to decay prematurely.

Codes:

- (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

Answer: (a)

Explanation: Both are true. Because solar activity heats the upper atmosphere, the atmosphere expands. This creates more "friction" (drag) for satellites like the Starlink fleet or ISRO's Earth observation satellites, potentially bringing them down. Therefore, predicting these cycles is essential for satellite mission planning.

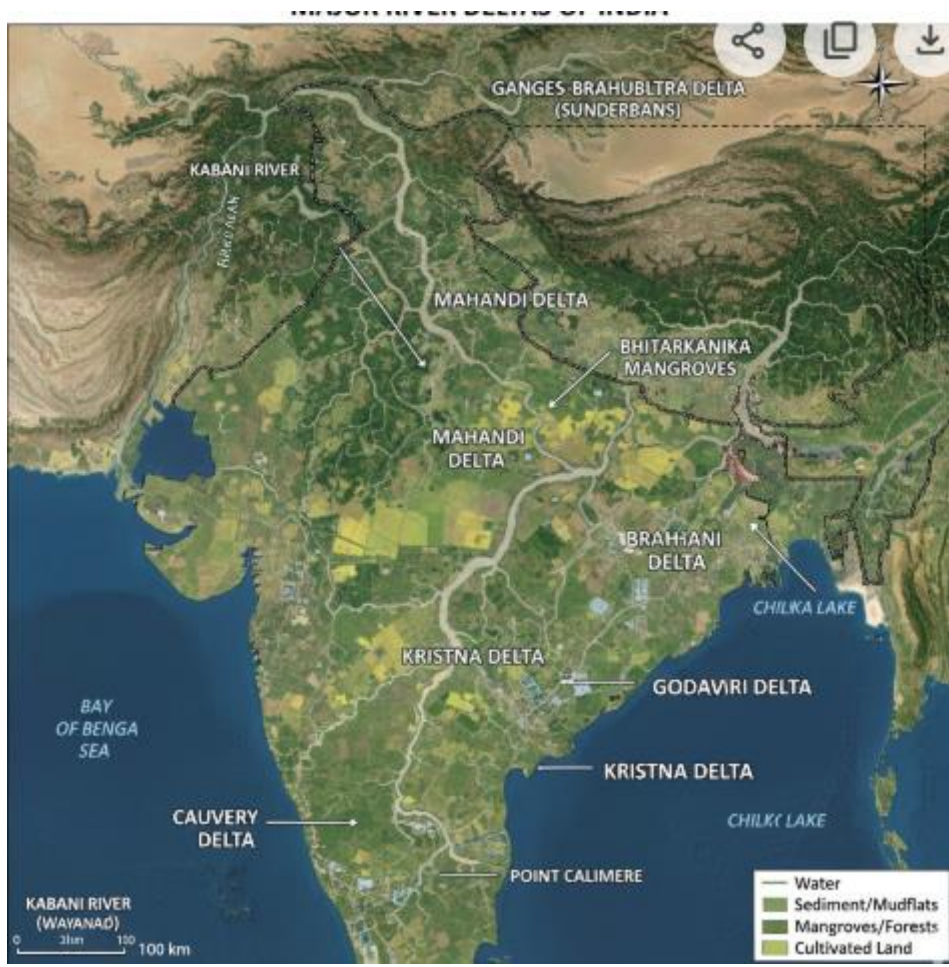
Subsidence of River Deltas' in India

This recent study is a major red flag for India's coastal security. It reveals that our deltas are not just "eroding" from the front, but subsiding (sinking) from within.

They used interferometric synthetic aperture radar data from the European Space Agency's Sentinel-1 satellite collected in 2014-2023. The study covered 40 major deltas around the world, **including six in India, at a spatial resolution of 75 m.**

✓ The Ganges-Brahmaputra, Brahmani, Mahanadi, Godavari, Cauvery, and Kabani deltas were all confirmed to be sinking, with more than 90% of the Ganges-Brahmaputra, Brahmani, and Mahanadi deltas' total area affected. In the Ganges, Brahmani, Mahanadi, Godavari, and Kabani deltas as well, the average rate of land subsidence exceeded the rate of regional sea-level rise.

✓ The team also found that 77% of the Brahmani delta and 69% of the Mahanadi delta were sinking at more than 5 mm/year. Even under the worst future climate scenario, the 95th-percentile subsidence rates in the Godavari delta were expected to exceed the projected rate of global sea-level rise.



Now what you understand by river deltas?

A river delta is a **landform created at the mouth of a river where it enters a slower-moving or still body of water**, such as an ocean, sea, or lake. It is formed by the deposition of sediment (silt, sand, clay) carried by the river, which settles as the water slows down.

These areas are often triangular or fan-shaped, serving as fertile, biologically rich ecosystems.

There are two major ways of classifying deltas. One considers the influences that create the landform, while the other considers its shape.

Influence:

There are four main types of deltas classified by the processes that control the build-up of silt: wave-dominated, tide-dominated, Gilbert deltas, and estuarine deltas.

Shapes of River Deltas



ARCUATE



BIRD'S FOOT



CUSPATE



INLAND

Q1. Assertion-Reason Type

Assertion (A): The Ganga-Brahmaputra delta is classified as an Arcuate delta.

Reason (R): The rate of sediment deposition by the river system is high, and the sea's wave action is moderate enough to maintain a fan-like shape.

Codes:

- Both A and R are correct and R is the correct explanation of A
- Both A and R are correct but R is not the correct explanation of A
- A is correct but R is incorrect
- A is incorrect but R is correct

Answer: (a)

Explanation:

The fan-shape (arcuate) is maintained precisely because the river brings enough silt to "push" into the sea, while waves smooth the edges.

Q2. Consider the following pairs of Indian Rivers and their Delta shapes:

1. Ganga: Arcuate Delta
2. Cauvery: Cuspate Delta
3. Krishna: Bird's Foot (Partial)
4. Narmada: Bird's Foot Delta

Which of the pairs given above are correctly matched?

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

Answer: a (1 AND 2 only)

The **Krishna Delta** is primarily **arcuate**.

Narmada does NOT form a delta. It forms an estuary in the Arabian Sea.

Central Pay Commission

Q1. Assertion (A) & Reason (R)

Assertion (A): The implementation of a Central Pay Commission often leads to a temporary increase in the "Revenue Deficit" of the Union Budget.

Reason (R): Salaries and pensions of government employees are classified as "Revenue Expenditure" rather than "Capital Expenditure."

Codes:

- 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

Answer: (a)

Explanation: Salaries don't create assets; they are recurring costs, hence Revenue Expenditure. When this expenditure rises sharply without a matching rise in revenue, the Revenue Deficit increases.

Q2. Regarding the **Central Pay Commission (CPC)**, which of the following statements is/are correct?

1. The Pay Commission is a statutory body established under the Administrative Tribunals Act, 1985.
2. The recommendations of the Pay Commission are binding on the Government of India.
3. First Pay Commission was set up in 1946 before independence.

Select the correct answer:

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


Statement 1 is Incorrect: The Central Pay Commission is an executive body (set up by a resolution of the Ministry of Finance) rather than a statutory body. It is not established under the Administrative Tribunals Act, 1985.

Statement 2 is Incorrect: The recommendations of the Pay Commission are advisory in nature. The Union Cabinet has the final authority to accept, modify, or reject any recommendation based on the prevailing fiscal situation.

Statement 3 is Correct: The First Pay Commission was indeed established in 1946 under the chairmanship of Srinivasa Varadachariar. While it submitted its report in 1947, its formation took place just before independence.

The Aykroyd Formula (based on nutritional and clothing requirements) has been the historical basis for calculating the minimum pay in India since the 15th Indian Labour Conference.

Read Article 309 of Indian Constitution:

 **309. Recruitment and conditions of service of persons serving the Union or a State.**—Subject to the provisions of this Constitution, Acts of the appropriate Legislature may regulate the recruitment, and conditions of service of persons appointed, to public services and posts in connection with the affairs of the Union or of any State:

Provided that it shall be competent for the President or such person as he may direct in the case of services and posts in connection with the affairs of the Union, and for the Governor ^{2***} of a State or such person as he may direct in the case of services and posts in connection with the affairs of the State, to make rules regulating the recruitment, and the conditions of service of persons appointed, to such services and posts until provision in that behalf is made by or under an Act of the appropriate Legislature under this article, and any rules so made shall have effect subject to the provisions of any such Act.

Article 309:

This article gives the appropriate Legislature (Parliament or State Legislatures) the power to regulate the recruitment and conditions of service of persons appointed to public services. It essentially allows the government to make "Rules" (like the CCS Rules) for its employees.

The Commission's Origin: The Pay Commission is an Executive Body. It is created by a simple Resolution passed by the Ministry of Finance (Department of Expenditure). It does not have a specific constitutional or statutory mandate.

The Connection: While the Commission itself isn't created under Article 309, the recommendations of the Commission, once accepted by the Cabinet, are often implemented by amending the service rules under the powers granted by Article 309.

Day 3, 5-topics series, UPSC PRELIMS 2026

11. Landraces

12. Global Biodiversity Framework Fund (GBFF)

13. Stubble burning in India

14. Agroforestry

15. D.E.S.I.G.N. for BioE3 Challenge

We will learn topics and solve questions.

Landraces

Odisha has launched a new SOP to integrate traditional seed varieties, known as landraces, into formal seed systems. This initiative aims to conserve agrobiodiversity and empower smallholder farmers by prioritizing farmers' knowledge and community seed systems.

Landraces are **locally adapted, traditional varieties of crops** that have evolved naturally over time through **farmers' selection and environmental adaptation**, without formal scientific breeding.

Key Characteristics

1. High genetic diversity (unlike uniform HYVs)
2. Location-specific adaptation
3. Resilience to stress (drought, pests, salinity, etc.)
4. Lower yield but higher stability
5. Evolved through natural + farmer-led selection.

Q1. With reference to **Landraces**, which of the following statements is/are correct?

1. Landraces are genetically uniform populations developed through scientific breeding.
2. They evolve through natural selection and farmer-led seed saving practices.
3. Landraces generally show greater resilience to local environmental stresses than many monoculture varieties.
4. They are legally recognized under the Protection of Plant Varieties and Farmers' Rights Act.

Statement 1 is Incorrect: Landraces are defined by their genetic diversity (heterogeneity), not uniformity. They are populations that have evolved naturally and through traditional practices, rather than being the product of controlled laboratory hybridization or industrial breeding.

Statement 2 is Correct: These varieties are the result of natural adaptation and human selection carried out by traditional farmers over many generations.

Statement 3 is Correct: Because they are "tuned" to local Agro-climatic conditions, they offer superior climate resilience, pest tolerance, and yield stability under low-input systems compared to uniform, industrially bred varieties.

Statement 4 is Correct: In India, the Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001 specifically recognizes and protects "farmers' varieties," which includes landraces. This allows communities to register their traditional seeds and protect them from bio-piracy.

Section 2(l) defines “**extant variety**”, which includes:

1. A variety notified under the Seeds Act, 1966
2. A farmers’ variety
3. A variety about which there is common knowledge
4. Any other variety in public domain

Since **landraces fall under “farmers’ varieties” or varieties of common knowledge**, they are legally recognised as *extant varieties* under this section.

'Global Biodiversity Framework Fund' (GBFF)

Q. With reference to the 'Global Biodiversity Framework Fund' (GBFF), consider the following statements:

1. It was established under the administrative control of the United Nations Environment Programme (UNEP).
2. It is the primary financial mechanism for the implementation of the Kunming-Montreal Global Biodiversity Framework.
3. The fund has a specific mandate to allocate at least 20% of its resources to support biodiversity action led by Indigenous Peoples and local communities.

Established in response to decisions from the Convention on Biological Diversity COP15, the Global Biodiversity Framework Fund (GBFF) will scale up financing for the implementation of the Kunming-Montreal Global Biodiversity Framework.

The GBFF aims to help countries achieve the Kunming-Montreal Global Biodiversity Framework goals and targets with a strategic focus on strengthening national-level biodiversity management, planning, policy, governance, and finance approaches. The fund was ratified by 186 countries and launched at the Seventh GEF Assembly in Vancouver, Canada in August 2023.

As of June 2025, a total of \$386 million has been pledged to the GBFF by 12 sovereign and subnational contributors: Austria, Canada, Denmark, France, Germany, Japan, Luxembourg, New Zealand, Norway, Province of Québec, Spain, and the United Kingdom.

The fund has specific, aspirational "portfolio targets" to ensure equity:

1. 20% for Indigenous Peoples and Local Communities (IPLCs) (This is unique as it bypasses traditional government-only channels).
2. 36% for Small Island Developing States (SIDS) and Least Developed Countries (LDCs).
3. 25% to be delivered through Multilateral Development Banks (MDBs) and international financial institutions.

The fund is the financial engine for the 23 targets of the KMGBF, which replaced the Aichi Biodiversity Targets. Notable targets include:

1. **30x30 Deal:** Conserving 30% of terrestrial, inland water, and coastal/marine areas.
2. **Pollution Reduction:** Reducing the risk from pesticides and highly hazardous chemicals by at least 50%.
3. **Resource Mobilization:** Closing the \$700 billion annual biodiversity funding gap.

Stubble burning in India

The news article says:

India has emerged as a global hotspot for methane emissions from crop-residue burning, according to a United Nations report released on November 17, 2025 at 30th Conference of Parties (COP30) to the UN Framework Convention on Climate Change taking place in Belem, Brazil. Stubble burning, already identified as a major driver of toxic air pollution across northern India, is now flagged as a major climate threat and experts say curbing it would deliver a “win-win” for both public health and the climate.

The report, produced by the UN Environment Programme (UNEP), finds that India is the world's third-largest methane emitter after China and the United States, producing around 31 million tonnes a year. “The G20 group of countries, including India, emits 65 per cent of global emissions,” an UNEP expert told this correspondent. Globally, annual methane emissions currently stand at 360 million tonnes.

The primary driver for the practice is the short turnaround time between the harvesting of the Kharif crop and the sowing of the Rabi crop. The Central Sector Scheme on 'CROP Residue Management' (CRM) provides subsidies for in-situ management of crop residue.

Q1. Which of the following gases released during stubble burning are major greenhouse gases?

1. Carbon dioxide (CO₂)
2. Methane (CH₄)
3. Nitrous oxide (N₂O)
4. Carbon monoxide (CO)
5. Nitrogen oxides (NO_x)

When identifying **Major Greenhouse Gases (GHGs)** released during stubble burning, it is important to distinguish between gases that have a direct “warming” effect on the atmosphere and those that are primarily air pollutants or precursors.

The major greenhouse gases among your list are:

1. **Carbon dioxide**
2. **Methane**
3. **Nitrous oxide**

Detailed Breakdown

1. **Carbon dioxide:** Released in the largest quantity during the combustion of organic matter.
2. **Methane:** Released due to incomplete combustion of the biomass. It has a global warming potential (GWP) significantly higher than CO₂.
3. **Nitrous oxide:** Released from the nitrogen content in the crop residue and the soil. It is an extremely potent GHG with a GWP nearly 300 times that of CO₂.

Why the others are excluded as “Major GHGs”:

1. **Carbon monoxide (\$CO\$):** While it is a weak direct GHG, it is primarily classified as an **indirect GHG**. It reacts with hydroxyl radicals in the atmosphere, which would otherwise remove methane, thereby indirectly increasing methane's lifespan.
2. **Nitrogen oxides:** These are considered **precursors**. They contribute to the formation of ground-level ozone (a GHG) and acid rain, but they are not categorized as major primary GHGs themselves.

Answer is 1, 2 and 3.

Q2. Which has emerged as India's farm stubble-burning hotspot for the second year running, recording nearly half of all crop-fire incidents across six northern states?

Madhya Pradesh has emerged as India's farm stubble-burning hotspot for the second year running, recording nearly half of all crop-fire incidents across six northern states, new data shows.

According to data from the Consortium for Research on Agroecosystem Monitoring and Modelling from Space (CREAMS) at the Indian Agricultural Research Institute (IARI), part of the Indian Council of Agricultural Research in New Delhi, 28,529 crop residue-burning incidents have been reported so far this year across Madhya Pradesh, Uttar Pradesh, Punjab, Haryana, Delhi and Rajasthan.

Nearly half of these events (14,165) were recorded in Madhya Pradesh. Uttar Pradesh reported 5,803 incidents, Punjab 5,092, Rajasthan 2,841, Haryana 623, and Delhi just five.

Agroforestry

We will solve two questions.

Q1. With reference to agroforestry in India, consider the following statements:

1. Agroforestry involves the deliberate integration of woody perennials with crops and/or livestock.
2. It is legally treated as equivalent to natural forests under the Forest (Conservation) Act, 1980.
3. It contributes to increasing tree cover outside recorded forest areas.

Which of the statements given above are correct?

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

Statement 1 is Correct: Agroforestry is a land-use management system where trees or shrubs (woody perennials) are grown around or among crops or pastureland. It integrates agricultural and forestry technologies to create more diverse, productive, and sustainable land-use systems.

Statement 2 is Incorrect: This is a major legal distinction. Agroforestry plantations on private lands are not treated as "natural forests" under the Forest (Conservation) Act, 1980. In fact, the government has been working to remove the "forest" tag from farm-grown trees to ensure farmers can harvest and transport their timber without the restrictive permissions required for natural forest timber.

Statement 3 is Correct: One of the primary goals of India's National Agroforestry Policy (2014) and the Green India Mission is to increase "Trees Outside Forests" (TOF). Since 33% forest cover cannot be achieved through recorded forest areas alone, agroforestry is the primary vehicle to expand green cover on private and community lands.

Q2. With reference to 'Agroforestry' in India, consider the following statements:

1. India was the first nation globally to adopt a dedicated National Agroforestry Policy.
2. Agroforestry is recognized as a key tool for achieving the 'Land Degradation Neutrality' (LDN) targets under the UNCCD.
3. The 'Har Medh Par Ped' scheme was launched specifically to promote the cultivation of trees on farm boundaries.

How many of the above statements are correct?

- a. Only one
- b. Only two
- c. All three
- d. None.

All three are correct.

D.E.S.I.G.N. for BioE3 Challenge

The **D.E.S.I.G.N. for BioE3 Challenge** is a flagship initiative launched by the **Department of Biotechnology (DBT)** in late 2025/early 2026. It is a critical component of the broader **BioE3 Policy** (Biotechnology for Economy, Environment, and Employment).

Q. With reference to the 'D.E.S.I.G.N. for BioE3 Challenge', consider the following statements:

1. It is a national initiative launched by the Ministry of Environment, Forest and Climate Change to promote organic farming.
2. The challenge specifically aims to foster the development of 'Bio-foundries' to bridge the gap between lab-scale research and industrial manufacturing.
3. It focuses on utilizing 'Synthetic Biology' to develop sustainable alternatives to petroleum-based chemicals.
4. One of its primary pillars is the promotion of 'Smart Proteins' and 'Functional Foods'.

How many of the above statements are correct?

- a. Only one
- b. Only two
- c. Only three
- d. All four

Statement 1 is Incorrect: It is an initiative of the Department of Biotechnology (DBT) under the Ministry of Science and Technology, not the Ministry of Environment.

Statement 2 is Correct: Bio-foundries are the physical infrastructure the D.E.S.I.G.N. challenge seeks to build.

Statement 3 is Correct: Synthetic biology is the "Engineering" (E) part of the acronym.

Statement 4 is Correct: These are listed as priority sectors under the BioE3 policy.

The banner features a blue background with a grid pattern. At the top, the title "D.E.S.I.G.N. for BioE3 Challenge" is written in white. Below it, a subtitle reads "12 BioE3 monthly challenge cycles starting 1st November 2025." The main text says "Empowering Youth to Solve Critical Issues of their TIMES". On the right, a circular diagram shows the acronym "BioE3" with lines connecting to six components: D (DEFINE REAL NEEDS), E (EVIDENCE FIRST), S (SUSTAINABILITY BY DESIGN), I (INTEGRATION), G (GO-TO-MARKET), and N (NET-POSITIVE IMPACT). Logos for the Department of Biotechnology, Government of India, and BRIC (a DBT Organization) are also present.

Core Objectives of the Challenge:

- A. **Shift from Chemical to Bio-based:** To move Indian industry from traditional chemical-based manufacturing to biomanufacturing using microorganisms, plants, and animal cells.
- B. **Climate Goals:** To support India's Net Zero goals by promoting "Green Carbon" technologies.
- C. **Bio-Foundries:** Establishing shared infrastructure where startups can scale their biological designs without high capital expenditure.

Day 4, 5-topics daily series, UPSC PRELIMS 2026

- 16. The Process: Biomass to Bio-Bitumen
- 17. Directorate General of Mines Safety (DGMS)
- 18. India–EFTA TEPA
- 19. UNESCO Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage
- 20. Vande Mataram

Now, we will learn topics and questions.

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The Process: Biomass to Bio-Bitumen

News:

Technology Transfer Event Held in New Delhi for **Bio-Bitumen via Pyrolysis Developed by CSIR-CRRI and CSIR-IIP:**

The roads constructed using this technology will involve lesser budget, have a more sustainable lifespan, and will also be free from the hazard of causing environmental pollution, says the Minister:

The production of Bio-Bitumen (also called Bio-asphalt) through the pyrolysis of biomass is a significant development in sustainable infrastructure. It offers a "green" alternative to conventional bitumen, which is a byproduct of crude oil refining.

In the 2026 UPSC context, this falls under Science & Technology (Renewable Energy) and Environment (Circular Economy).

The transformation happens via Fast Pyrolysis:

Feedstock: Non-edible biomass such as agricultural residue (stubble), forest waste, or even treated sewage sludge.

Process: The biomass is heated to 400°C – 600°C in the absence of oxygen.

Result: This breaks the complex organic polymers (Lignin, Cellulose) into three states:

- a. Bio-oil (Liquid - used for Bio-Bitumen).
- b. Bio-char (Solid - used for soil health).
- c. Syngas (Gas - used for energy).

Solve one question:

Q1. With reference to 'Bio-Bitumen' produced via pyrolysis, consider the following statements:

1. Bio-bitumen is primarily derived from the lignin component of agricultural and forest biomass.
2. The process of pyrolysis requires a high-oxygen environment to ensure the complete combustion of organic matter.
3. Bio-bitumen can be used as a partial or total substitute for petroleum-based bitumen in road construction.
4. The production of Bio-bitumen generates 'Bio-char' as a byproduct, which can be utilized for carbon sequestration in soil.

How many of the above statements are correct?

- a. Only one
- b. Only two
- c. Only three
- d. All four

Explanation:

Lignin is an aromatic polymer present in biomass. Its structure resembles petroleum-derived bitumen (rich in aromatic compounds). During pyrolysis, lignin contributes significantly to bio-oil fractions that can be upgraded into bio-bitumen.

So, Statement 1 is correct.

Pyrolysis occurs in absence or very limited oxygen. If oxygen is present in high amounts → it leads to combustion, not pyrolysis. Pyrolysis is thermal decomposition, not burning.

So, Statement 2 is incorrect.

Bio-bitumen is being tested as:

- A. Partial replacement (blending)
- B. In some cases, full replacement
- C. It improves sustainability and reduces carbon footprint.

So, Statement 3 is correct.

Pyrolysis produces:

- A. Bio-oil (can be upgraded to bio-bitumen)
- B. Syngas
- C. Biochar

Biochar is stable carbon material used in soil → long-term carbon sequestration.

So, Statement 4 is correct.

Directorate General of Mines Safety (DGMS)

In January 2026, the **Directorate General of Mines Safety (DGMS)** celebrated its **125th Foundation Day** at its headquarters in Dhanbad, Jharkhand. This milestone highlights the long evolution of India's mining safety standards, from colonial-era inspections to the modern digital and robotic safety era.

Q. With reference to the '**Directorate General of Mines Safety**' (DGMS), consider the following statements:

1. It is a statutory body under the Ministry of Mines responsible for regulating mineral exploration and auctioning.
2. The jurisdiction of DGMS extends to offshore mining operations within India's territorial waters.
3. It was recently declared a 'Science & Technology Institution' to support R&D in mining safety.
4. The Director General of DGMS is the final authority for granting mining leases in India.

How many of the above statements are correct?

- a. Only one
- b. Only two
- c. Only three
- d. All four

Statement 1 is Incorrect: It is under the **Ministry of Labour & Employment, not the Ministry of Mines**. Its focus is on safety, not exploration/auctions.

Statement 4 is Incorrect: Granting mining leases is the role of the Ministry of Mines and state governments; DGMS only regulates safety standards once the mine is operational.

For administering the provisions of the Indian Mines Act, 1901, the Government of India set up a "Bureau of Mines Inspection" on the 7th of January 1902 with headquarters at Calcutta. The name of the organization was changed to the Department of Mines in 1904 and its headquarters shifted to Dhanbad in 1908. On 01.01.1960, the organization was renamed as "Office of the Chief Inspector of Mines". Since 01.05.1967, the office has been re-designated as Directorate General of Mines Safety (DGMS in short).

THE VISION OF DGMS

To attain risk and hazard-free conditions of work and welfare of persons employed in mines.

THE MISSION OF DGMS

To identify and reduce the risk of accidents and diseases in and around the mine through-

- (i) Development of suitable legislation, rules, regulations, standards, and guidelines;
- (ii) Adequate measures to ensure compliance and awareness initiatives to inculcate safety and health culture amongst work-persons and stakeholders.

India–EFTA Trade and Economic Partnership Agreement (TEPA)

Go through this link to cover this topic:

Link: <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2173138®=3&lang=2>

Q1. Consider the following statements.

1. Among EFTA countries, Switzerland is the largest trading partner of India followed by Norway.
2. Under the TEPA, the EFTA States have committed to facilitate foreign direct investment of USD 100 billion into India over a period of 15 years.
3. Gold, which is a major import from Switzerland, has been kept under the sensitive list with no significant tariff reductions

All statements are correct.

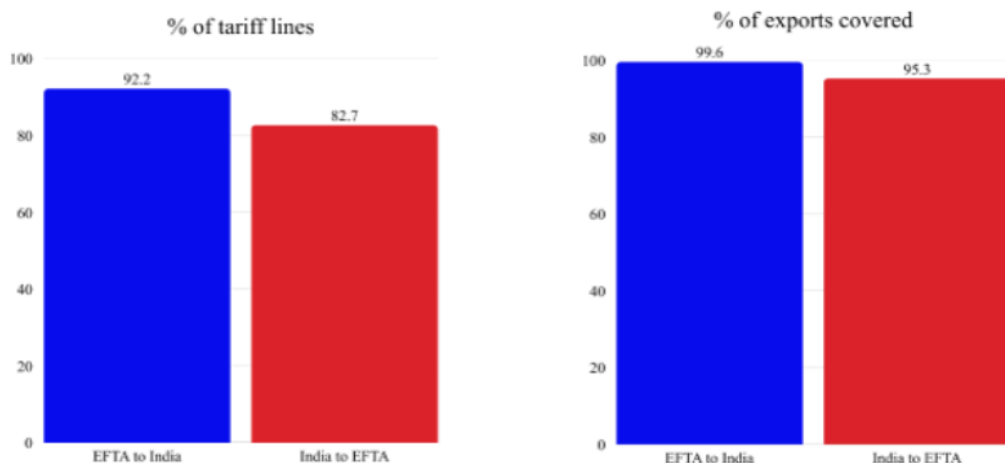
As per Article 7.1 of TEPA, the EFTA States shall aim to increase foreign direct investment (FDI) from their investors into India by **USD 50 billion within 10 years from the entry into force of the Agreement, and an additional USD 50 billion in the succeeding 5 years**, amounting to a total of USD 100 billion over 15 years.

Concurrently, the EFTA States shall aim to facilitate the generation of 1 million direct jobs in India resulting from these investment inflows.

Among EFTA countries, Switzerland is the largest trading partner of India followed by Norway.

India's offer to EFTA covers 82.7% of tariff lines, accounting for 95.3% of EFTA exports.

Over 80% of these imports are Gold, with no change in effective duty on Gold. Sensitive sectors protected, including pharma, medical devices, processed food, dairy, soya, coal, and sensitive agricultural products.



EFTA removes duties on 92.2% lines (covering 99.6% of India's exports). India offers 82.7% lines (95.3% of EFTA exports). Gold duty effectively unchanged.

India has safeguarded its sensitive sectors such as dairy, soya, coal and sensitive agricultural products.

I have covered trade related topics for EFTA in daily quizzes. So, almost all topics covered.

UNESCO Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage

Q. With reference to the 'Intergovernmental Committee for Safeguarding of Intangible Cultural Heritage', consider the following statements:

1. The Government of India hosted the 2025 session of the UNESCO Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage.
2. India was elected as a member of this Committee for the 2022-2026 cycle.
3. To date, 28 Indian elements have been inscribed on the UNESCO Representative list.

For the Safeguarding of Intangible Cultural Heritage, UNESCO adopted the 2003 Convention on 17th October 2003 during its 32nd General Conference in Paris. The *Convention responded to global concerns that living cultural traditions, oral practices, performing arts, social customs, rituals, knowledge systems, and craftsmanship were increasingly threatened by globalisation, social change, and limited resources.*

The Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage advances the objectives of the 2003 Convention and ensures their effective implementation across Member States.

The **Government of India hosted the 20th session of the UNESCO Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage** from 8 to 13 December 2025 in New Delhi.

This will be the first time that India hosts the ICH Committee session.

Composition of the Committee

The **Members of the Intergovernmental Committee** are elected by the States Parties meeting in General Assembly according to the principles of equitable geographical representation and rotation. According to **Article 6.7** of the Convention, States Members of the Committee shall choose as their representatives persons who are qualified in the various fields of the intangible cultural heritage.

Based on the principle of equitable geographical representation foreseen by the Convention in **Article 6.1**, the General Assembly decided in June 2006 that the seats in the Committee would be distributed among the six **UNESCO electoral groups** in proportion to the number of States Parties from each group, it being understood that in a Committee of 24 members, each group will occupy at least three seats.

Terms of office

States Members to the Committee are elected for a term of four years, and every two years, the General Assembly shall renew half of them. A State Member of the Committee may not be elected for two consecutive terms.

Deepavali (Diwali) was inscribed on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity in December 2025, becoming India's 16th entry. Third statement is incorrect.

Indian ICH heritage inscribed on UNESCO's Representative List of the ICH of Humanity

S. No.	ICH Heritage	Year of Inscription	State/ Union Territory
1.	Tradition of Vedic chanting	2008	All states
2.	Ramlila, the traditional performance of the Ramayana	2008	All states
3.	Kutiyattam, Sanskrit theatre	2008	Kerala
4.	Ramman, religious festival and ritual theatre of the Garhwal Himalayas, India	2009	Uttarakhand
5.	Mudiyettu, ritual theatre and dance drama of Kerala	2010	Kerala
6.	Kalbelia folk songs and dances of Rajasthan	2010	Rajasthan
7.	Chhau dance	2010	Eastern India (West Bengal, Jharkhand, Odisha)
8.	Buddhist chanting of Ladakh: recitation of sacred Buddhist texts in the trans-Himalayan Ladakh region, Jammu and Kashmir, India	2012	UT of Ladakh, UT of Jammu & Kashmir
9.	Sankirtana, ritual singing, drumming and dancing of Manipur	2013	Manipur
10.	Traditional brass and copper craft of utensil making among the Thatheras of Jandiala Guru, Punjab, India	2014	Punjab
11.	Yoga	2016	All States
12.	Nawrouz, Novruz, Nowrouz, Nowrouz, Nawrouz, Nauryz, Nooruz, Nowruz, Navruz, Nevruz, Nowruz, Navruz	2016	All states
13.	Kumbh Mela	2017	Uttar Pradesh, Uttarakhand, Maharashtra, Madhya Pradesh
14.	Durga Puja in Kolkata	2021	West Bengal
15.	Garba of Gujarat	2023	Gujarat

'Vande Mataram'

Q1. Arrange the following events related to 'Vande Mataram' in the correct chronological order:

1. Inclusion of the song in the novel 'Anandamath'.
2. Composition of the song by Bankim Chandra Chattopadhyay.
3. First performance of the song at an INC session.
4. Translation of the song into English by Sri Aurobindo.

Select the correct answer:

- a. 2-1-3-4
- b. 1-2-4-3
- c. 2-1-4-3
- d. 1-2-3-4

Solution: a

Explanation:

1. Composition of the song – around 1875–76
2. Inclusion in the novel Anandamath – 1882

3. First sung at INC session (Calcutta) – 1896 (by Rabindranath Tagore)
4. English translation by Sri Aurobindo – early 1900s (during Swadeshi movement phase)

Q2. With reference to the song 'Vande Mataram', consider the following statements:

1. It was originally composed as a part of the novel 'Anandamath' to celebrate the victory of the Marathas over the Mughals.
2. It was adopted as the National Song of India by the Constituent Assembly in 1947, immediately after independence.
3. The Carlyle Circular was issued to suppress nationalist activities among students, including the singing of 'Vande Mataram' in educational institutions.

Statement 1 is Incorrect: While it is in *Anandamath*, the novel is set during the **Sanyasi Rebellion** against the British East India Company, not a Maratha-Mughal conflict.

It was adopted on **January 24, 1950**, not in 1947.

During the Swadeshi Movement (1905–08), Vande Mataram became a powerful nationalist slogan, especially after the Partition of Bengal (1905).

The British administration in Bengal **issued the Carlyle Circular (1905) to curb nationalist activities** in educational institutions. It:

1. Prohibited students from participating in political movements
2. Threatened disciplinary action against institutions encouraging nationalist activities
3. Was used to suppress the singing and public use of Vande Mataram in schools and colleges.

Q3. The song 'Vande Mataram' is a part of the Fundamental Duties mentioned in Part IV-A of the Constitution?

Article 51A(a) mentions the "National Anthem" and the "National Flag," but **it does not explicitly mention the "National Song"** (Vande Mataram).

Day 5, 5-topics series, UPSC Prelims 2026

21. National Maritime Heritage Complex (NMHC) at Lothal in Gujarat

22. Guarantee for Rozgar and Aajeevika Mission (Gramin) (VB—G RAM G) Bill, 2025

23. Eco-design for Sustainable Products Regulation (ESPR)

24. National Green Tribunal

25. India- New Zealand Trade pact

Learn topics and answer questions.

National Maritime Heritage Complex (NMHC) at Lothal in Gujarat

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1. The National Maritime Heritage Complex (NMHC) is a flagship project under the SagarMala Programme of the Ministry of Ports, Shipping and Waterways? Correct.
2. It is being developed as an international tourist destination under the 'PRASHAD' scheme of the Ministry of Tourism? Incorrect.
3. The Netherlands is the only international partner helping India with the development of the NMHC? Incorrect.
India has also signed MoUs with **Portugal, Vietnam, Germany, and the UAE** for this project).
4. Lothal is a UNESCO World Heritage Site? Incorrect.
5. It is world-famous for having the earliest known man-made dockyard? correct.

Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB—G RAM G) Bill, 2025

Learn this bill here: <https://prsindia.org/billtrack/the-viksrit-bharat-%E2%80%93-guarantee-for-rozgar-and-ajeevika-mission-gramin-vb-%E2%80%93-g-ram-g-bill-2025>

Q1. With reference to the **Viksrit Bharat—Guarantee for Rozgar and Ajeevika Mission (Gramin) Bill, 2025**, consider the following statements:

1. It seeks to replace the Mahatma Gandhi National Rural Employment Guarantee Act, 2005.
2. It increases the guaranteed number of employment days from 100 to 125 days.
3. It removes the provision of unemployment allowance.

Which of the statements given above is/are correct?

Solution: 2 only

Q2. Consider the following statements regarding the VB—G RAM G Bill, 2025:

1. The funding pattern for all states is fixed at a 60:40 ratio between the Centre and States.
2. It mandates the preparation of 'Viksrit Gram Panchayat Plans' which must be integrated with the PM Gati Shakti National Master Plan.
3. The Bill removes the provision for unemployment allowance to promote a work-first culture.

Which of the statements given above is/are correct?

Only 2 is correct.

Q3. With reference to agricultural season restrictions under VB—GRAM:

1. States must declare a mandatory 60-day pause period every year.
2. The pause period aims to avoid labour diversion during peak agricultural operations.
3. The pause applies uniformly across all districts of India.

Solution: 2 only

Q4. Regarding the 'Agricultural Pause' provision in the VB—G RAM G Bill, 2025, consider the following statements:

1. State governments are required to notify a period of up to 60 days where works under the scheme will not be undertaken.
2. This pause is intended to coincide with peak agricultural seasons such as sowing and harvesting.
3. The 125-day guarantee is reduced proportionately to the length of the notified pause.

Solution: 1 and 2 only.

Q5. The VB—G RAM G Bill, 2025, emphasizes the use of technology for monitoring and implementation. Which of the following is NOT a technology-related provision mentioned in the Bill?

- a. Mobile application-based dashboards for real-time tracking
- b. Automated drone-based wage disbursement
- c. Biometric authentication for transactions
- d. Geospatial technology for planning and monitoring

Solution: b

Eco-design for Sustainable Products Regulation (ESPR)

The [Ecodesign for Sustainable Products Regulation](#) (ESPR), which entered into force on 18 July 2024, is the cornerstone of the Commission's approach to more environmentally sustainable and circular products.

Products and the way we use them can significantly impact the environment. Consumption in the EU can, therefore, be a major cause of climate change and pollution.

The ESPR is part of [a package of measures](#) that are central to achieving the aims of the [2020 Circular Economy Action Plan](#) and fostering the transition to a circular, sustainable, and competitive economy. It will contribute to helping the EU reach its environmental and climate goals, double its circularity rate of material use and achieve its energy efficiency targets by 2030.

Q1. Consider the following statements regarding the "Digital Product Passport" (DPP) under the ESPR framework:

1. It is a mandatory electronic tool designed to provide consumers and businesses with information on the environmental sustainability of a product.

2. The DPP is exclusively applicable to textile products manufactured within the European Union and does not apply to imported goods.

Which of the statements given above is/are correct?

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

Q2. With reference to the **Eco-design for Sustainable Products Regulation (ESPR)**, consider the following statements:

1. It empowers the European Commission to set requirements for almost all physical goods placed on the EU market.
2. It aims to prevent "Greenwashing" by setting clear standards for product durability and repairability.
3. The regulation includes a specific exemption for Small and Medium Enterprises (SMEs) regarding the ban on destroying unsold textiles.

Which of the statements given above are correct?

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

Q3. In the context of global trade, how is the ESPR expected to act as a "Non-Tariff Barrier" for Indian exporters?

- a. By imposing a direct customs duty on all textile shipments to the EU.
- b. By requiring Indian manufacturers to adhere to strict EU-specific sustainability and transparency standards to access the market.
- c. By banning the export of raw cotton from India to European textile hubs.
- d. By mandating that all Indian textiles must be sold only through European e-commerce platforms.

Answer Key & Explanations

Q1: (a) Statement 2 is incorrect. ESPR applies to products placed on the EU market, regardless of where they are produced (imports are included).

Q2: (a) Statement 3 is incorrect. While there are some transitions, the ban aims for broad compliance; however, typically, the most stringent reporting and bans hit large enterprises first to avoid overburdening SMEs immediately, but the regulation itself sets the goal for the market.

Q3: (b) Technical standards and sustainability requirements often act as "Non-Tariff Barriers" (NTBs) because they require costly compliance and documentation.

National green Tribunal

Answer the following questions:

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1. The National Green Tribunal has been established under which Act?
2. The Tribunal is mandated to make and endeavor for disposal of applications or appeals finally within 6 months of filing of the same?
3. Tribunal is not bound by procedure under the Code of Civil Procedure, 1908?
4. The Chairperson has to a Judge of the Supreme Court of India or Chief Justice of a High Court?
5. Any person aggrieved by order of the Tribunal can file an appeal to the Supreme Court?

THE NATIONAL GREEN TRIBUNAL ACT, 2010

ACT NO. 19 OF 2010

[2nd June, 2010.]

An Act to provide for the establishment of a National Green Tribunal for the effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto.

AND WHEREAS India is a party to the decisions taken at the United Nations Conference on the Human Environment held at Stockholm in June, 1972, in which India participated, calling upon the States to take appropriate steps for the protection and improvement of the human environment;

AND WHEREAS decisions were taken at the United Nations Conference on Environment and Development held at Rio de Janeiro in June, 1992, in which India participated, calling upon the States to provide effective access to judicial and administrative proceedings, including redress and remedy and to develop national laws regarding liability and compensation for the victims of pollution and other environmental damage;

AND WHEREAS in the judicial pronouncement in India, the right to healthy environment has been construed as a part of the right to life under article 21 of the Constitution;

AND WHEREAS it is considered expedient to implement the decisions taken at the aforesaid conferences and to have a National Green Tribunal in view of the involvement of multi-disciplinary issues relating to the environment.

BE it enacted by Parliament in the Sixty-first Year of the Republic of India as follows:—

First statement is wrong, as you can see it was established in 2010.

5. Qualifications for appointment of Chairperson, Judicial Member and Expert Member.—(1)

A person shall not be qualified for appointment as the Chairperson or Judicial Member of the Tribunal unless he is, or has been, a Judge of the Supreme Court of India or Chief Justice of a High Court:

Provided that a person who is or has been a Judge of the High Court shall also be qualified to be appointed as a Judicial Member.

19. Procedure and powers of Tribunal.—(1) The Tribunal shall not be bound by the procedure laid down by the Code of Civil Procedure, 1908 (5 of 1908) but shall be guided by the principles of natural justice.

(2) Subject to the provisions of this Act, the Tribunal shall have power to regulate its own procedure.

(3) The Tribunal shall also not be bound by the rules of evidence contained in the Indian Evidence Act, 1872 (1 of 1872).

22. Appeal to Supreme Court.—Any person aggrieved by any award, decision or order of the Tribunal, may, file an appeal to the Supreme Court, within ninety days from the date of communication of the award, decision or order of the Tribunal, to him, on any one or more of the grounds specified in section 100 of the Code of Civil Procedure, 1908 (5 of 1908):

The Tribunal is mandated to make and endeavor for disposal of applications or appeals finally within 6 months of filing of the same.

India- New Zealand Trade pact

Q1. Currently, New Zealand is India's largest trading partner in Oceania?

Currently, New Zealand is India's second-largest trading partner in Oceania.

Q2. New Zealand will provide 100 per cent duty-free market access on all tariff lines, covering 100 per cent of India's current exports?

100% Indian Exports receive Duty-Free Access: New Zealand will provide *100 per cent duty-free market access* on all tariff lines, covering 100 per cent of India's current exports. This ensures immediate competitiveness for Indian products across labour-intensive manufacturing and in pharmaceutical, chemical, engineering, and agri-processed sectors, reducing landed costs and expanding export opportunities. Earlier New Zealand maintained peak tariffs of 10% in key Indian exports like textile and apparel products, leather, ceramics, carpets, automobiles and auto components. With the zero-duty market access to Indian products, India will become competitive in New Zealand and have a level playing field in New Zealand.

Q3. India has granted immediate tariff elimination on all tariff lines, thereby providing 100% duty-free market access to New Zealand?

India has offered market access in **70.03% of the tariff lines** covering **95% of Bilateral Trade Value** while keeping **29.97 % tariff lines in exclusion**. Immediate Elimination (EIF) on 30%, Rest is phased

- The products that are kept in exclusion are mainly- Dairy (milk, cream, whey, yoghurt, cheese etc.), animal products (other than sheep meat), vegetable products (onions, chana, peas, corn, almonds etc.), sugar, artificial honey, Animal, vegetable or microbial fats and oils, Arms and Ammunition, Gems and Jewellery, Copper and Articles (Cathodes, Cartridges, Rods, Bars, Coils etc.), Aluminium and articles thereof (Ingots, billets, wire bars) among others.

Q4. India-New Zealand trade? **Deficit or surplus.**

Country: NEW ZEALAND					Report Dated: 21 Feb 2026 Values in US \$ Million	
S.No.	Year	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
1	EXPORT	486.25	487.60	547.84	538.33	711.10
2	%Growth		0.28	12.35	-1.74	32.09
3	India's Total Export	291,808.48	422,004.40	451,070.00	437,072.03	437,704.58
4	%Growth		44.62	6.89	-3.10	0.14
5	%Share	0.17	0.12	0.12	0.12	0.16
6	Import	381.53	374.84	477.74	335.07	587.13
7	%Growth		-1.75	27.45	-29.86	75.22
8	India's Total Import	394,435.88	613,052.05	715,968.90	678,214.77	721,200.22
9	%Growth		55.43	16.79	-5.27	6.34
10	%Share	0.10	0.06	0.07	0.05	0.08
11.	Total Trade	867.78	862.44	1,025.58	873.40	1,298.23
12	%Growth		-0.62	18.92	-14.84	48.64
13.	India's Total Trade	686,244.36	1,035,056.45	1,167,038.89	1,115,286.81	1,158,904.80
14	%Growth		50.83	12.75	-4.43	3.91
15	%Share	0.13	0.08	0.09	0.08	0.11
16.	TRADE BALANCE	104.73	112.76	70.10	203.25	123.97
17.	India's Trade Balance	-102,627.40	-191,047.65	-264,898.90	-241,142.74	-283,495.65

Q5. The "Tariff Rate Quota" (TRQ) system mentioned in the India-NZ trade context is primarily used by India to:

- Eliminate all taxes on imported luxury cars from New Zealand.
- Allow a specific quantity of sensitive agricultural products (like Kiwifruit) at lower duties while protecting domestic farmers.
- Mandate that all NZ exports must be shipped only through Indian state-owned vessels.
- Tax Indian pharmaceutical exports to New Zealand to increase government revenue.

Tariff Rate Quota (TRQ) is a trade policy tool where:

- Imports are allowed at **lower or zero tariff up to a specified quantity (quota)**.
- Once the quota limit is exceeded, **higher normal tariffs apply**.
- It balances **market access commitments** and **protection of domestic producers**.

In the India–New Zealand FTA context:

- India may allow limited imports of sensitive agricultural goods like **kiwifruit, dairy substitutes, etc.** at concessional tariffs.
- Beyond that quota, higher tariffs discourage excessive imports and protect Indian farmers.

Day 6, 5-Topics daily series, UPSC Prelims 2026

26. UNESCO Creative Cities Network (UCCN)

27. LVM3-M5/CMS-03 Mission

28. World Summit for Social Development 2025

29. World Travel Market (WTM)

30. Global Coalition for Social Justice

Learn topics and solve few questions.

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UNESCO Creative Cities Network (UCCN)

Mission

Launched in 2004, the UNESCO Creative Cities Network (UCCN) aims to strengthen cooperation with and among cities that have recognized creativity as a strategic factor of sustainable development as regards economic, social, cultural and environmental aspects. By joining the Network, cities acknowledge their commitment to sharing best practices, developing partnerships that promote creativity and the cultural industries, strengthening participation in cultural life and integrating culture in urban development plans. The Network further commits to supporting the United Nations frameworks, particularly the 2030 Agenda for Sustainable Development. The UNESCO Creative Cities Network covers eight creative fields: Architecture, Crafts and Folk Art, Design, Film, Gastronomy, Literature, Media Arts, and Music.

Q1. With reference to the UNESCO Creative Cities Network, consider the following statements:

1. It was launched to promote sustainable urban development through creativity.
2. It provides legal protection to monuments located in the designated cities.
3. Membership is granted to countries rather than individual cities.

Which of the statements given above are correct?

- a. 1 only
- b. 2 only
- c. 1 and 3 only
- d. None.

Solution:

Explanation:

Statement 1 is correct: The primary mission of the UCCN (established in 2004) is to foster international cooperation among cities that have identified creativity as a strategic factor for sustainable urban development. It aligns with the UN's 2030 Agenda, particularly SDG 11 (Sustainable Cities and Communities).

Statement 2 is incorrect: UCCN is a development and cooperation network, not a conservation treaty. Legal protection for monuments is the domain of the UNESCO World Heritage Convention (1972). Being a "Creative City" does not grant legal status or protection to physical structures or monuments.

Statement 3 is incorrect: As the name suggests, the network is focused on individual cities and their local governments/stakeholders. While applications are supported by the respective National Commissions for UNESCO, the membership and obligations rest with the city itself.

Q2. Which of the following is/are part of UNCCN?

1. Architecture
2. Design
3. Film
4. Literature

Prior to October 2025, there were only seven fields. However, on World Cities Day 2025, UNESCO designated the first set of "Cities of Architecture," bringing the total number of categories to eight.

The Updated 8 Creative Fields

1. Architecture (Added in 2025)
2. Crafts and Folk Art
3. Design
4. Film
5. Gastronomy
6. Literature
7. Media Arts
8. Music

Q3. Choose correct pairs:

1. Lucknow: Gastronomy
2. Kozhikode: Literature
3. Gwalior: Music
4. Srinagar: Crafts and Folk Art
5. Mumbai: Film
6. Hyderabad: Gastronomy

Select the correct code.

- a. Only three
- b. Only four
- c. Only five
- d. All six.

All are correct.

City	Category	Year Joined
Lucknow	Gastronomy	2025
Kozhikode	Literature	2023
Gwalior	Music	2023
Srinagar	Crafts and Folk Art	2021
Mumbai	Film	2019
Hyderabad	Gastronomy	2019
Chennai	Music	2017
Jaipur	Crafts and Folk Art	2015
Varanasi	Music	2015

LVM3-M5/CMS-03 Mission

LVM3-M5 / CMS-03 Mission

LVM3 is the operational heavy lift Launch Vehicle of ISRO and has a spectacular pedigree of completing seven consecutive successful missions. LVM3-M5 is the fifth Operational Flight of LVM3, aims to launch the CMS-03 spacecraft to Geo-synchronous Transfer Orbit (GTO). LVM3-M5 will be launched from the Second Launch Pad (SLP), SDSC, SHAR.

Mission Highlights:

- CMS-03, weighing about 4410 kg, will be the heaviest communication satellite to be launched to Geo-synchronous Transfer Orbit (GTO) from Indian soil.
- CMS-03 is a multi-band communication satellite that will provide services over a wide oceanic region including the Indian landmass.

LVM3-M5 Vehicle Configuration (2S200+L110 (HTVE)+C25+5 m OPLF)



LVM3-M5 Stages at a Glance			
Stages	Strap-Ons (2 x S200)	Core Stage (L110)	Upper Stage (C25)
Length (m)	26.22	21.4	13.5
Diameter (m)	3.2	4.0	4.0
Propellant	Solid (HTPB)	Liquid (UH25 + N ₂ O ₄)	Cryo (LH ₂ & LOX)
Propellant Mass (t)	204.5 (each)	115.9	28.6

Q1. CMS-03 is the heaviest communication satellite to be launched to Geosynchronous Transfer Orbit (GTO) from Indian soil?

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Q2. It acts as a replacement for the GSAT-7 (Rukmini) satellite to maintain maritime communication continuity?

Q3. LVM3-M5 is the fifth Operational Flight of LVM3, aims to launch the CMS-03 spacecraft to Geosynchronous Transfer Orbit (GTO)?

All statements are correct.

World Summit for Social Development 2025

With reference to the **World Summit for Social Development (WSSD)**, consider the following statements:

1. The first WSSD held in Copenhagen in 1995 resulted in the adoption of the "20:20 Initiative" for social services.
2. The Second World Summit for Social Development was hosted by India in 2025 to mark the 30th anniversary of the Copenhagen Declaration.
3. India participated in Second World Summit for Social Development 2025.

Only two statements are correct here.

Dr. Mansukh Mandaviya to Lead Indian Delegation to Second World Summit for Social Development in Doha from 4-6 November 2025

The **World Summit for Social Development (WSSD)** is a landmark global gathering organized by the United Nations to address the social dimensions of development. While the first summit in 1995 set the foundational agenda, a second summit was recently held in November 2025 to revitalize these goals in the modern context.

First World Summit (Copenhagen, 1995)

This was the largest gathering of world leaders at the time, resulting in the **Copenhagen Declaration and Programme of Action**. It shifted the global focus from purely economic growth to a "people-centered" approach.

- **Three Core Issues:** Poverty eradication, full employment, and social integration.
- **The 20:20 Initiative:** A proposal where developing countries commit 20% of their budget and donor countries commit 20% of their aid (ODA) to basic social services.
- **Commitments:** It outlined 10 specific commitments including gender equality, universal education, and structural adjustment programs that are socially responsible.

Second World Summit (Doha, 2025)

Held from **November 4–6, 2025, in Doha, Qatar**, this summit aimed to address the gaps left by the COVID-19 pandemic and the growing global inequality.

- **Outcome:** Adoption of the **Doha Political Declaration**.
- **Focus:** Reaffirming the Copenhagen goals while integrating them with the **2030 Agenda (SDGs)**.

- **New Priorities:** Digital inclusion, climate-resilient social protection, and addressing the "feminization of poverty."

World Travel Market (WTM)

The **World Travel Market (WTM)** is one of the largest and most influential events in the global travel and tourism industry. While there are several regional editions (WTM Latin America, WTM Africa), the flagship event is **WTM London**, held annually in November.

Q1: With reference to the World Travel Market (WTM), consider the following statements:

1. It is a premier global B2B event that serves as a platform for the tourism industry to negotiate business deals and discover latest trends.
2. The 'Incredible India' pavilion at WTM is organized annually by the Ministry of External Affairs to promote cultural diplomacy.

Which of the statements given above is/are correct?

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

Explanation:

Statement 1 is correct: WTM is a professional trade show where business contracts are the primary goal.

Statement 2 is incorrect: The pavilion is organized by the Ministry of Tourism, not the Ministry of External Affairs (though they coordinate on the Chalo India initiative).

Q2: The "Global Trends Report," which identifies shifting patterns in international travel and tourism, is a key publication released at the:

- a. World Economic Forum
- b. World Travel Market
- c. United Nations World Tourism Organization (UNWTO) General Assembly
- d. G20 Tourism Working Group

Explanation: The WTM Global Trends Report is the industry standard for predicting future travel habits, such as the rise of "Solo Travel" or "Workations."

Global Coalition for Social Justice

With reference to the 'Global Coalition for Social Justice', consider the following statements:

1. It is a specialized agency of the World Economic Forum (WEF) aimed at reforming global corporate governance.

2. Membership is restricted exclusively to sovereign states that are members of the United Nations.
3. India is a founding member of this coalition, reflecting its commitment to social security and labour welfare.

Which of the above are correct?

Answer: Only 3.

The **Global Coalition for Social Justice** is a high-level initiative launched by the **International Labour Organization (ILO)** in late 2023 and gained significant momentum through 2024 and 2025. It aims to address the growing global inequalities and ensure that "social justice" is prioritized in national and international policy-making.

The Global Coalition for Social Justice is a multi-stakeholder initiative established in 2023 by the International Labour Organization (ILO), at the initiative of the ILO Director-General, Gilbert F. Houngbo. It is firmly rooted in the ILO's historical mandate, as enshrined in the preamble of its Constitution, which affirms that **universal and lasting peace can be established only if it is based upon social justice.**

Participation in the Coalition is voluntary and open to a wide array of partners including governments, employers' and workers' organizations, international organisations and bodies, regional organisations and bodies, enterprises and business networks, international non-governmental organizations, and academia.

India, as a founding member of ILO and a key member in the Coordinating Group of the Global Coalition, is playing a crucial role in the Coalition for furthering the agenda of social justice.

Day 7, 5 Topics daily series, UPSC PRELIMS 2026

31. Mumbai–Ahmedabad High Speed Rail Bullet Train Project

32. 'Silent Conversation: From Margins to the Centre'

33. Green Hydrogen Hubs under National Green Hydrogen Mission

34. Delhi Declaration on Local Action for Global Climate Goals

35. Logistics Excellence, Advancement, and Performance Shield (LEAPS) 2025

Learn topics and solve questions.

Mumbai–Ahmedabad High Speed Rail Bullet Train Project

Q1. The project cost is not shared in a 50:50 ratio between India and Japan?

Q2. The project includes India's first undersea rail tunnel at Thane Creek?

Q3. The J-Slab track system of ballastless track based on the Japanese technology is being used for the first time for project?

Q4. The Mumbai–Ahmedabad High Speed Rail (MAHSR) project covers a total distance of 2000 km?

Original link: <https://www.nhsrcl.in/en/project/project-overview>

About 81% of the total cost of the project will be funded by the Government of Japan through JICA. The remaining project cost will be funded by Government of India.

The tenure of the loan is 50 years with a moratorium of 15 years.

According to the equity structure of the Special Purpose Vehicle, 50% is held by the Government of India (GoI), through the Ministry of Railways, and 25% each by the Government of Maharashtra and the Government of Gujarat.

The alignment features a 21 km long tunnel, including India's first 7 km long undersea tunnel under Thane Creek.

This tunnel will be constructed using a combination of two tunneling methods – New Austrian Tunneling Method (NATM) to carve out 5 km of the tunnel and the remaining 16 km through Tunnel Boring Machines (TBM).

The J-Slab track system of ballastless track based on the Japanese Shinkansen track technology is being used for the project. **This is for the first time**, the J-slab ballastless track system is being used in India.

'Silent Conversation: From Margins to the Centre'

Tribal Art Exhibition - 'Silent Conversation: From Margins to the Centre' - to be inaugurated in New Delhi today

Over 50 tribal artists from across 17 States to showcase artworks giving insight into issues related to tiger conservation, habitat protection and symbiotic relationship between Nature and these Communities

Q1. The 'Silent Conversation: From Margins to the Centre' initiative is primarily associated with which statutory body in India?

- National Commission for Scheduled Tribes (NCST)
- National Tiger Conservation Authority (NTCA)
- Wildlife Trust of India (WTI)
- Central Zoo Authority (CZA)

'Silent Conversation: From Margins to the Centre' is a significant high-level art exhibition and symposium launched in late 2025/early 2026. Organized by the **National Tiger Conservation Authority (NTCA)** in collaboration with the **Sankala Foundation**, the project serves as a bridge between wildlife conservation and the cultural identity of India's forest-dwelling communities.

The initiative is rooted in the philosophy that "*Conservation is not possible without Community.*"

A. **The "Silent" Dialogue:** It refers to the deep, unspoken bond between tribal communities and the tiger—a relationship based on co-existence rather than conflict.

- B. **From Margins to Centre:** Historically, tribal narratives have been on the "margins" of mainstream conservation discourse. This project brings their art, wisdom, and sustainable lifestyle to the "centre" (national and international platforms).
- C. **Tribal Art:** The exhibition showcases traditional art forms like Warli, Gond, Pithora, and Sohrai, specifically focusing on how these communities depict the tiger and their natural habitat.

Green Hydrogen Hubs under National Green Hydrogen Mission

Q1. Which of the following major ports in India have been recognized as 'Green Hydrogen Hubs' under the National Green Hydrogen Mission?

1. Deendayal Port (Kandla)
2. Paradip Port
3. V.O. Chidambaranar Port (Tuticorin)
4. Jawaharlal Nehru Port (JNPT)

Select the correct answer using the code given below:

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

Green Hydrogen Hubs

The Mission will identify and develop regions capable of supporting large scale production and/or utilization of Hydrogen as Green Hydrogen Hubs.

Development of necessary infrastructure for such hubs will be supported under the Mission.

It is planned to set up at least two such Green Hydrogen hubs in the initial phase.

Outlay of ₹ 400 crore up to 2025-26 for Hubs and other projects.

Under the National Green Hydrogen Mission, the Ministry of Ports, Shipping and Waterways (MoPSW) has **officially designated three major ports as "Green Hydrogen Hubs."** These ports will serve as the primary gateways for the production, storage, and export of Green Hydrogen and its derivatives (like Green Ammonia).

The three recognized ports are:

1. Deendayal Port (Kandla, Gujarat)
2. V.O. Chidambaranar Port (Tuticorin, Tamil Nadu)
3. Paradip Port (Odisha)

Delhi Declaration on Local Action for Global Climate Goals

Q1. Consider the following statements regarding the **Delhi Declaration on Local Action for Global Climate Goals**:

1. It was adopted during the World Sustainable Development Summit (WSDS) 2026.
2. The declaration emphasizes that local governments should have direct access to international climate finance.

Which of the statements given above is/are correct?

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

Answer: C

The **Delhi Declaration on Local Action for Global Climate Goals** was adopted in **February 2026** at the conclusion of the **World Sustainable Development Summit (WSDS)**.

Key Pillars of the Declaration:

- a. **Climate Finance for Cities:** Urges global financial institutions to create direct credit lines for local bodies, bypassing the bureaucratic delays of central sovereign guarantees.
- b. **Localization of SDGs:** Aims to align municipal budgets with the Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities).
- c. **Data-Driven Governance:** Advocates for the creation of "Local Climate Action Plans" (LCAPs) using satellite data and IoT to monitor urban heat islands and air quality.
- d. **The "LiNC" Framework:** Introduced the Local Integration for Climate (LiNC) framework to ensure that local traditional knowledge is integrated into modern urban engineering.

The Delhi Declaration is a **voluntary framework/declaration**, not a legally binding treaty, and while international bodies support it, it emerged primarily from the WSDS platform (hosted by TERI).

Logistics Excellence, Advancement, and Performance Shield (LEAPS) 2025

Q1. Consider the following statements regarding the **LEAPS 2025 initiative**:

1. It is an initiative of the Ministry of Road Transport and Highways to monitor the quality of National Highways.
2. The awards aim to promote the objectives of the National Logistics Policy (NLP) by recognizing excellence in the supply chain.

Which of the statements given above is/are correct?

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

LEAPS is a flagship initiative of the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry, aims to benchmark logistics excellence, strengthen India's competitiveness, and align with the vision of the National Logistics Policy (NLP) and PM GatiShakti.

LEAPS 2025 has been conceptualized to acknowledge and celebrate best practices, innovation, and leadership within India's logistics industry. **It covers a wide spectrum of logistics players — including air, road, sea, and rail freight operators; warehousing; multimodal transporters; MSMEs; Startups; and Academia.**

The initiative also **emphasizes sustainability, ESG (Environmental, Social, and Governance) practices, and Green Logistics, encouraging collaboration between Government, Industry, and Academia to enhance efficiency, transparency, and resilience in the logistics ecosystem.**

Day 8, 5 topics daily series, UPSC PRELIMS 2026, By Abhishek Sir.

36. Ministry of Mines Classifies Limestone as Major Mineral

37. Graded Response Action Plan stages

38. 1-GW hyperscale Google Data Centre

39. National Council of Educational Research and Training (NCERT)

40. BHARATI initiative to boost agri-food exports

Ministry of Mines Classifies Limestone as Major Mineral

Q1. With reference to the **reclassification of Limestone as a 'Major Mineral'**, consider the following statements:

1. Major minerals are subject to a mandatory e-auction process for the grant of mining leases.
2. The royalty rates for major minerals are fixed by the State Governments independently of the Centre.
3. Limestone is an essential raw material for both the cement industry and as a flux in the iron and steel industry.

Which of the statements given above are correct?

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

Statement 2 is incorrect; the **Central Government** fixes the royalty rates for major minerals, which are specified in the Second Schedule of the MMDR Act. Statements 1 and 3 are correct.

In terms of Section 9(1) of the Mines and Minerals (Development and Regulation) (MMDR) Act, 1957, every mining lease holder needs to pay royalty for major minerals removed or consumed as per the royalty rates specified in the Second Schedule of the MMDR Act, 1957.

As per Section 9 (3) of the MMDR Act Central Government shall notify the rate of royalty payable in respect of a mineral. Royalty is collected and retained by the State Governments concerned.

In a significant move to streamline the mineral economy in early 2026, the **Ministry of Mines** officially reclassified **Limestone** from a 'Minor Mineral' to a '**Major Mineral**'.

The Shift in Classification:

1. The Legislative Basis: The classification of minerals **is governed by the Mines and Minerals (Development and Regulation) Act, 1957** (MMDR Act).
2. Prior Status: Previously, Limestone was largely treated as a minor mineral, giving State Governments the primary power to frame rules regarding its leasing and royalty.
3. New Status: By classifying it as a "Major Mineral," the Central Government now sets the uniform policy for its auctioning and management across India, although the revenue still primarily flows to the states.

Graded Response Action Plan stages

Q1. Actions under GRAP Stages II, III and IV are invoked only after the AQI reaches the prescribed threshold of that stage?

2. Based on the dynamic model and weather/ meteorological forecast by IMD / IITM on a day-to-day basis, actions under Stages II, III and IV of the GRAP shall be invoked in advance of the AQI reaching to the projected levels of that stage, also provided that the higher projected AQI levels are likely to sustain for longer periods (say 3 days or more).

Q2. Actions under higher GRAP stages are implemented in addition to those already in force under lower stages?

3. Restrictive actions undertaken as per previous stages shall be continued, in addition to the air pollution stage under which the restrictive actions are envisaged to be taken. For example, restrictive actions under the Stage III category, whenever invoked, shall be in addition to those under Stage I and II respectively and so on and so forth.

Q3. Stage 1 of GRAP is triggered only after the AQI crosses the 300 mark (Very Poor category)?

Q4. The Commission for Air Quality Management (CAQM) is the statutory body responsible for implementing GRAP in the NCR?

Go through this link below and see all stages (focus on AQI of different stages)

Link: <https://caqm.nic.in/WriteReadData/LINKS/af18d720-6f39-445a-a29b-30d69c50a7a2.pdf>

1-GW hyperscale Google Data Centre

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In early 2026, Google announced the ground-breaking of its first **1-Gigawatt (1-GW) Hyperscale Data Centre** campus in India. This project marks a massive leap in India's digital infrastructure, shifting from standard data centers to "hyperscale" facilities capable of supporting the exponential growth of AI, cloud computing, and the 5G ecosystem.

Q. With reference to the 'Data Centre Policy' in India, consider the following statements:

1. Data Centres have been granted 'Infrastructure Status' to help developers access long-term institutional credit at easier terms.
2. The Ministry of Electronics and Information Technology (MeitY) is the nodal ministry for data center regulation.

Select the correct code.

Data Centres have been granted Infrastructure Status in India. This was done in 2022, when the Government included Data Centres under the Harmonized Master List of Infrastructure Sub-sectors.

The **Ministry of Electronics and Information Technology (MeitY)** is the **nodal ministry for Data Centre policy, promotion, and regulatory framework.**

Q2. Which of the following technologies is most likely to be utilized in a 1-GW hyperscale data center to reduce its enormous water footprint for cooling?

- a. Open-loop evaporative cooling
- b. Closed-loop liquid immersion cooling
- c. High-pressure steam injection
- d. Conventional fan-based air cooling

Solution: b

Explanation:

Open-loop evaporative cooling — Incorrect

1. Uses **large amounts of water**
2. Water evaporates continuously and must be replenished
3. This method actually **increases water footprint**, not reduces it

UPSC trap: sounds efficient but is water-intensive

Closed-loop liquid immersion cooling — Correct

1. Servers are immersed in **special dielectric liquid**
2. Heat is removed through a **closed-loop system**
3. Water use is **minimal or near-zero**
4. Extremely efficient for **hyperscale and AI data centers**

This technology is increasingly used in:

- a. Hyperscale cloud facilities
- b. AI compute clusters
- c. Sustainable data centre infrastructure—exactly the use case in question

High-pressure steam injection — Incorrect

1. Not used for cooling data centers
2. Would increase heat and damage equipment

Eliminate immediately

Conventional fan-based air cooling — Incorrect

- a. Uses air only, but **not sufficient for hyperscale high-density loads**
- b. Less efficient
- c. Requires additional cooling systems, often water-based

National Council of Educational Research and Training (NCERT)

Q1. It is a statutory body established under an Act of Parliament to regulate teacher education in India?

Q2. The Union Minister of Education serves as the President of the General Body of NCERT?

Q3. The National Curriculum Framework (NCF) is formulated by NCERT to provide a blueprint for school education?

Q4. NCERT acts as the nodal agency for the implementation of the National Achievement Survey (NAS)?

Q5. The textbooks developed by NCERT are mandatory for all State Board schools under the Right to Education Act?

First and fifth statements are incorrect.

The **National Council of Educational Research and Training (NCERT)** is an autonomous organization **set up in 1961 by the Government of India.**

It serves as a literary, scientific, and charitable society under the Societies Registration Act. Its primary role is to advise and assist the Ministry of Education in implementing policies for qualitative improvement in school education

The Right of Children to Free and Compulsory Education Act 2009 does NOT mandate NCERT textbooks for State Boards. Education is in the Concurrent List, and States have autonomy.

State Boards usually develop textbooks through their own SCERTs. NCERT books are mandatory only in CBSE-affiliated schools, not State Board schools.

BHARATI initiative to boost agri-food exports

APEDA launches BHARATI initiative to boost agri-food exports

Q1. It is a flagship program launched by the APEDA (Agricultural and Processed Food Products Export Development Authority) to boost seafood exports?

Q2. The initiative aims to leverage blockchain and AI technologies to address traceability and quality assurance in exports?

Q3. It aims to achieve a target of \$50 billion in agri-food exports by the year 2030?

Q4. The program includes a three-month acceleration module for selected Agri-tech startups?

Q5. It places a special emphasis on promoting GI-tagged and organic products in the global market?

All statements are correct. Just learn all above.

Day 9, 5 Daily Topic series, UPSC PRELIMS 2026, By Abhishek sir

41. Coal Gasification Technology

42. Silver Hallmarking

43. 2D Materials

44. Methandienone Long-term Metabolite (LTM)

45. DialogueNEXT Conference

Learn topics and solve questions.

Coal Gasification Technology

Introduction:

Coal gasification is a thermochemical process that converts coal into syngas (a mixture of CO, H₂, CO₂, CH₄ and others), which can have various applications such as electricity generation, chemical production (methanol, ammonia, urea), and liquid fuels. With rising global energy demand and the need for cleaner utilisation of coal resources, coal gasification has emerged as a strategic technology in several countries, including China, the US, South Africa, and India. India possesses the fourth-largest coal reserves globally, with an estimated 389 billion tonnes, of which 212 billion tonnes are classified as proven reserves. Coal gasification allows for the cleaner utilization of these vast resources to achieve energy security and self-reliance, reduce dependency on imports of natural gas, methanol, ammonium nitrate, and other products.

Q1. With reference to **India's National Coal Gasification Mission**, consider the following statements:

1. The mission aims to achieve 100 million tonnes of coal gasification by the year 2047.
2. The government provides a 50% rebate on revenue sharing for coal used specifically for gasification purposes.
3. Syngas produced through this technology can be used as a feedstock for the production of "Blue Hydrogen."

Which of the statements given above are correct?

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

Explanation:

Statement 1 is incorrect as the target year is **2030**, not 2047. Statement 2 is correct (incentive policy). Statement 3 is correct; when H₂ is produced from fossil fuels like coal but the resulting CO₂ is captured/stored, it is called "Blue Hydrogen."

Q2. In the context of coal gasification, what is the primary advantage of Syngas over direct coal combustion for power generation?

- a. It eliminates the production of Carbon Dioxide entirely.
- b. It allows for the removal of pollutants like sulphur and mercury before the gas is used for energy.
- c. It requires significantly less water than traditional thermal power plants.
- d. It can only be produced from high-grade Anthracite coal.

Explanation: The "cleaner" aspect of gasification comes from the fact that impurities are filtered out of the gas stream pre-combustion. While it still produces CO₂, capturing it from a concentrated gas stream is more efficient than capturing it from the smoke of a traditional chimney.

Q3. Consider the following statements regarding the Suitability of Gasification Technologies in the Indian context:

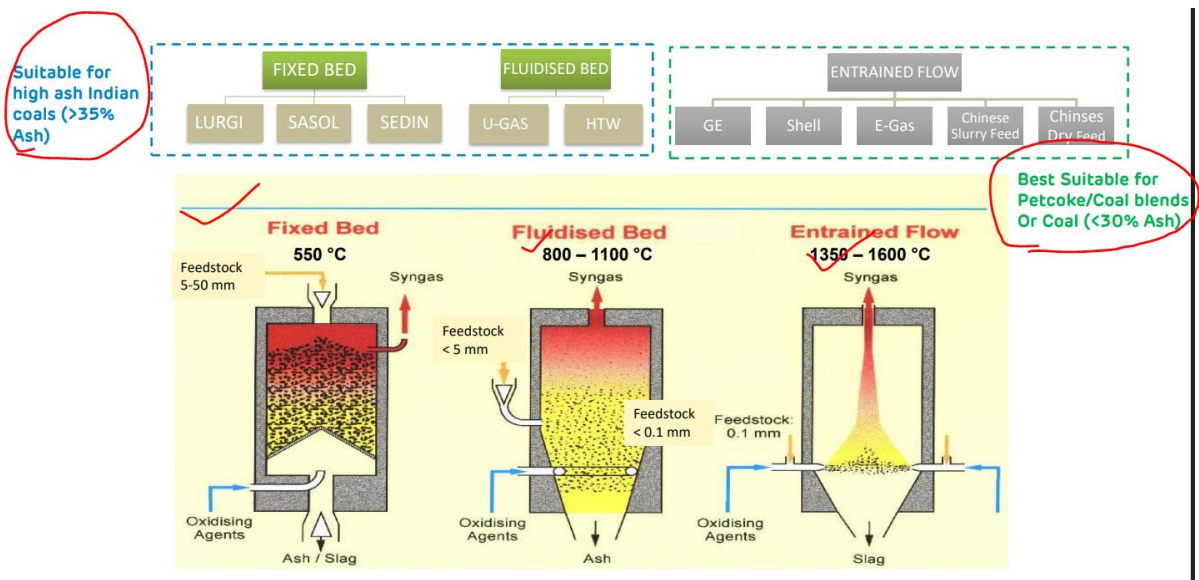
1. Entrained Flow gasifiers operate at significantly higher temperatures compared to Fixed Bed gasifiers.
2. In Entrained Flow gasification, the ash is removed primarily in the form of liquid slag.
3. Fluidized Bed gasification is considered unsuitable for coals with an ash content exceeding 35%.

Which of the statements given above are correct?

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

Explanation:

Correct Answer: A. Statements 1 and 2 are correct. Statement 3 is incorrect; the provided chart explicitly identifies Fluidized Bed technology as "Suitable for high ash Indian coals (>35% Ash)."



Silver Hallmarking

In a significant move to ensure consumer protection and digital traceability, the Government of India has extended the **Hallmarking Unique Identification (HUID)** system to silver jewellery and artefacts.

Q1. Consider the following statements.

1. Presently, Hallmarking Unique Identification (HUID) is mandatory for gold and silver jewellery?
2. HUID is a six-digit alphanumeric code laser-marked on each hallmarked silver article, in addition to the BIS Standard Mark?
3. Consumers can instantly verify the authenticity of hallmarked silver jewellery by entering the HUID on mobile app?

Building upon the strong foundation created by the HUID system for gold, Bureau of Indian Standards (BIS) has introduced Mandatory Hallmarking Unique Identification (HUID) for hallmarked **silver jewellery with effect from 1 September 2025**, marking a major step towards strengthening consumer protection and curbing fake hallmarking practices.

HUID is a **six-digit alphanumeric code** laser-marked on each hallmarked silver article, in addition to the BIS Standard Mark, the word *SILVER*, and the purity grade.

Consumers can instantly verify the authenticity of hallmarked silver jewellery by entering the HUID on the BIS CARE mobile app (available on Android and iOS). The app displays key details such as:

- a. Purity of the article
- b. Type of jewellery (ring, anklet, chain, etc.)
- c. Details of the jeweller who submitted the article for hallmarking
- d. Details of the Assaying & Hallmarking Centre

Link: <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2163768®=3&lang=1>

2D Materials



1.1 What are 2D materials

2D materials are crystalline substances with a thickness ranging from one to a few atomic layers, typically less than 1 nanometer (nm). Their atomically thin structure—extending in two dimensions with minimal thickness in the third—imparts unique electronic, optical, and mechanical properties compared to their 3D counterparts.

Key features:

Atomic Structure & Mechanical Strength

In 2D materials like graphene, atoms are arranged in a honeycomb lattice held together by incredibly strong covalent bonds. Because the structure is "near-perfect" (defect-free), there are no weak points.

- A) Force Distribution: Mechanical stress is distributed evenly across the lattice.
- B) Result: This makes them significantly stronger than steel while remaining incredibly lightweight.

High Electron Mobility & Thermal Conductivity

The smooth, organized pathway of the atoms allows electrons and heat to move with minimal resistance.

- A) Phonon Scattering: In thicker materials, "phonons" (vibrations) bump into each other and scatter, creating heat/resistance. In 2D materials, this scattering is suppressed.
- B) Fast Electronics: High electron mobility means transistors can switch faster, leading to high-speed, low-power microchips.

Tunable Band Gaps

In electronics, a "band gap" acts like a switch that determines if a material is a conductor or an insulator.

- A) The Customization: While graphene lacks a natural band gap, other 2D materials (like TMDCs) allow scientists to "tune" the band gap by changing the number of layers, stretching the material (strain), or adding chemicals.
- B) Application: This makes them perfect for custom semiconductors used in quantum computing and neuromorphic (brain-like) AI chips.

High Surface-to-Volume Ratio

Because these materials are "all surface" and no bulk, every single atom is exposed to the environment.

- A) Sensitivity: Even a single molecule landing on the surface can change the material's electrical properties.
- B) Application: This makes them the ultimate material for ultra-sensitive sensors—detecting diseases in blood or trace pollutants in the air.

Q1. With reference to **two-dimensional (2D) materials**, consider the following statements:

1. Their exceptional mechanical strength arises primarily due to strong in-plane covalent bonding.
2. All 2D materials possess zero band gap similar to graphene.
3. Their high surface-to-volume ratio enhances their suitability for sensor applications.

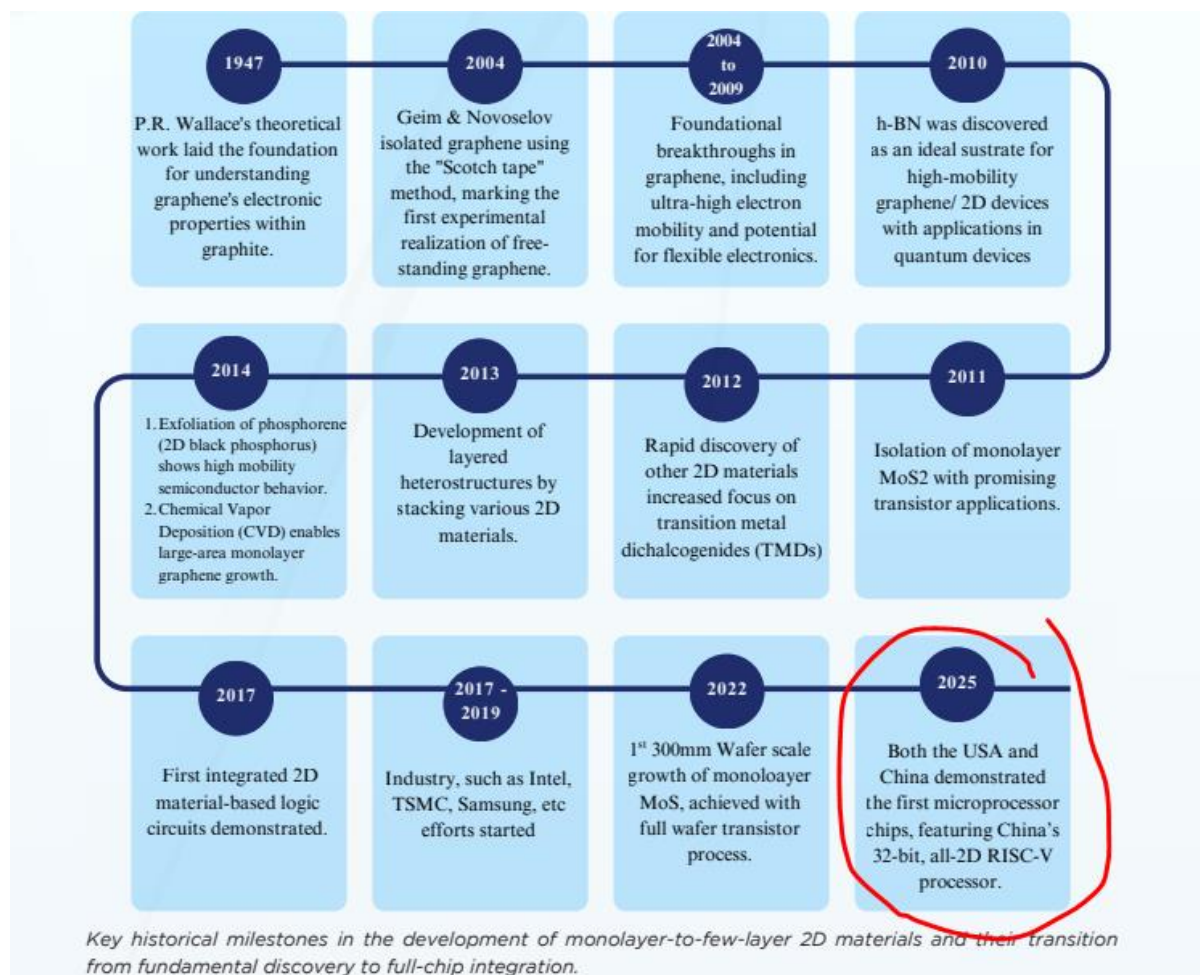
Which of the statements given above are correct?

- a. 1 and 2 only

- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

Only **Statement 2 – Incorrect**

Only graphene has zero band gap. Many 2D materials (MoS₂, WS₂, etc.) have finite and tunable band gaps.



Methandienone Long-term Metabolite (LTM)

In a significant step towards strengthening anti-doping efforts in sports, the National Institute of Pharmaceutical Education and Research (NIPER) Guwahati, under the Department of Pharmaceuticals, in collaboration with the National Dope Testing Laboratory (NDTL), New Delhi, has successfully developed a rare and high-purity Reference Material (RM) – **Methandienone Long-Term Metabolite (LTM)**.

Q1. Consider the following statements.

Assertion (A): Modern drug testing can detect the use of anabolic steroids even weeks after the athlete has stopped consuming them.

Reason (R): Long-Term Metabolites (LTMs) are stable byproducts that remain in the human body far longer than the original parent compound.

- a. Both A and R are true, and R is the correct explanation of A.
- b. Both A and R are true, but R is not the correct explanation of A.
- c. A is true but R is false.
- d. A is false but R is true.

Explanation:

Both are true. The stability and slow excretion of LTMs (Reason) are exactly why the detection window is so long (Assertion).

Also know:

Reference Materials (RMs) are the most highly purified and scientifically characterized forms of drug substances or their metabolites, essential for accurate analytical testing. In the context of anti-doping, they are crucial for the detection of over 450 substances that are currently prohibited by the World Anti-Doping Agency (WADA). Due to their specialized application in dope testing, these RMs are produced by only a few manufacturers globally (approximately 4–5), making them scarce and often expensive.

DialogueNEXT Conference

Q1. The "DialogueNEXT" series of conferences, often seen in the news, is an initiative primarily led by which organization?

- a. Food and Agriculture Organization (FAO)
- b. World Food Prize Foundation
- c. International Fund for Agricultural Development (IFAD)
- d. World Economic Forum (WEF)

Explanation:

DialogueNEXT was launched by the World Food Prize Foundation in 2024 to create a global dialogue on food security and carry forward Dr. Norman Borlaug's legacy.

The DialogueNEXT conference series is a high-level global initiative launched by the World Food Prize Foundation. Its primary mission is to convene global leaders, scientists, and farmers to discuss breakthrough agricultural innovations and find actionable solutions to end world hunger.

Key Aspects of DialogueNEXT (2025-2026):

1. **Objective:** To retrace the legacy of Dr. Norman E. Borlaug (father of the Green Revolution) by visiting key landmarks of his work and mobilizing a "moonshot" push to feed a projected 9.7 billion people by 2050.
2. **DialogueNEXT India (Sept 2025):** Held in New Delhi with the theme "Take it to the Farmer." It focused on ensuring that agri-tech, climate-smart practices, and nutritious food systems actually reach smallholder farmers in the Global South.

3. **The "Borlaug Dialogue":** These regional DialogueNEXT events serve as the build-up to the main Norman E. Borlaug International Dialogue, scheduled for October 20–22, 2026, in Des Moines, Iowa.
4. **Partnerships:** It is organized in collaboration with major institutions like ICAR (Indian Council of Agricultural Research), CIMMYT (International Maize and Wheat Improvement Center), and the Borlaug Institute for South Asia (BISA).

Day 10, 5 Topics Daily Series, UPSC PRELIMS 2026, BY Abhishek sir.

46. Laisong Formation

47. Vice President election

48. Aspergillus Species

49. Skating World Championships 2025

50. Polymetallic Sulphides (PMS)

Learn topics and solve questions.

Laisong Formation

Q1. Fossil leaves from **the Laisong Formation**, which provided evidence for early monsoon conditions during the Eocene–Oligocene transition, were discovered in which one of the following States?

- a. Meghalaya
- b. Assam
- c. Nagaland
- d. Arunachal Pradesh

Researchers from Indian institutes analysed fossil leaves found in the **Laisong Formation of Nagaland**.

Age: Approximately 34 million years old (dating back to the Eocene-Oligocene transition).

Climate Evidence: The shape and characteristics of these leaves indicate they grew in a climate that was significantly warmer and wetter than previously thought for that era.

The Antarctic Connection:

The study suggests a "teleconnection" where the freezing of the south pole triggered a heat/rain engine in the north:

- A) Ice Formation: Around 34 million years ago, massive ice sheets began to form over Antarctica.
- B) Global Temperature Gradient: As the south became colder, the temperature difference between the poles and the equator intensified.

- C) **Atmospheric Shift:** This gradient changed global wind patterns and shifted the Intertropical Convergence Zone (ITCZ), a belt of low pressure that governs tropical rainfall.

Why This Matters:

- A) **Paleoclimate Accuracy:** It proves that a strong monsoon existed much earlier than some previous models suggested.
- B) **Future Predictions:** Understanding how historical ice volume changes affected rainfall helps scientists predict how melting ice sheets today might disrupt modern monsoon patterns, which are vital for India's agriculture and economy.

Vice President election

Q1. In the context of the **election of the Vice-President of India**, consider the following statements:

1. Any citizen of India can act as a proposer or seconder in the Vice-Presidential election.
2. Only elected Members of Parliament can act as proposers and seconders in the Vice-Presidential election.
3. In the Vice-Presidential election, even nominated Members of Parliament can act as proposers and seconders.

Which of the statements given above is/are correct?

- a. 1 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 2 only

Solution: c

Explanation:

News:

CP Radhakrishnan files VP nomination with PM Modi as proposer

For Vice-Presidential Election:

- (a) Nomination must be subscribed by at least 20 electors as proposers.
- (b) And at least 20 electors as seconders.

Before 1997, it was only 5 proposer and seconder. The change was made by the Amendment Act of 1997 to the Presidential and Vice-Presidential Elections Act, 1952. For the Vice-Presidential election, a **nomination must be subscribed by at least twenty electors as proposers and twenty electors as seconders.**

In **Presidential and Vice-Presidential elections**, only **Electors** (members of the Electoral College) can propose or second a candidate's nomination. **So, first is incorrect.**

For Vice-President, electoral college = all MPs (elected + nominated), **so even nominated MPs can propose/second.**

Q2. It includes both elected and nominated members, whereas nominated members cannot vote in the Presidential election?

Q3. The voting is done by secret ballot?

Q4. Person Must be qualified for election as a member of the Rajya Sabha (Council of States)?

2, 3 AND 4 ARE CORRECT.

Aspergillus species

Unveiling Hidden Diversity in *Aspergillus Nigri* by Indian scientists:
Introducing two new species from the Western Ghats, India

Posted On: 10 SEP 2025 4:36PM by PIB Delhi

Researchers have identified two novel species of *Aspergillus Nigri* (commonly known as black aspergillus), *Aspergillus dhakephalkarii* and *Aspergillus patriciawiltshireae*, and reported the first geographic record of two black aspergilli *A. aculeatinus* and *A. brunneoviolaceus*, from soil samples collected from the Western Ghats.

The genus ***Aspergillus*** comprises a diverse group of filamentous fungi that are ubiquitously distributed across various ecological niches and are of considerable medical, industrial, and ecological significance.

Q1. With reference to the genus *Aspergillus*, consider the following statements:

1. *Aspergillus* is a type of bacteria commonly used in the fermentation of dairy products.
2. All species of *Aspergillus* are pathogenic to humans.
3. Certain species are used in industrial-scale production of organic acids.

Which of the statements given above are correct?

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

Statement 1 is incorrect: *Aspergillus* is a fungus (mold), not a bacteria. Dairy fermentation (like yogurt) typically uses bacteria such as *Lactobacillus*.

Statement 2 is incorrect: Out of several hundred species, only a few (like *A. fumigatus* or *A. flavus*) are pathogenic. Many species are harmless or even beneficial to humans.

Statement 3 is correct: *Aspergillus niger* is the primary organism used for the industrial production of citric acid and gluconic acid.

Skating World Championships 2025

Consider the following statements regarding the 2025 World Speed Skating Championships:

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1. The event was hosted in Beidaihe, China.
2. Indian skaters secured gold medals in both the Senior and Junior categories of the 1000m sprint.
3. India won first-ever gold medal at the Speed Skating World Championships in China.

All are correct.

Anandkumar Velkumar won India's **first-ever gold medal** at the Speed Skating World Championships in **China**.

The 22-year-old speedster clinched the senior men's 1000m sprint title with a timing of 1:24.924s, becoming the first Indian World Champion in speed skating.

Indian speed skater Krish Sharma won the gold medal in the Junior Men's 1000m sprint at the 2025 World Speed Skating Championships in Beidaihe, China.

Polymetallic Sulphides (PMS)

Q1. With reference to India's deep-sea exploration, consider the following:

1. India is the first country to receive a "Pioneer Investor" status for Polymetallic Nodules in the Indian Ocean.
2. The "Samudrayaan" mission is India's first manned deep-ocean mission to study deep-sea resources.
3. The Carlsberg Ridge is located within India's Exclusive Economic Zone (EEZ).

How many of the statements above are correct?

- a. Only one
- b. Only two
- c. All three
- d. None

Statements 1 and 2 are correct. Statement 3 is incorrect because the exploration rights are for the "Area" (International Waters) beyond the EEZ, which is why approval from the ISA was required.

Science Minister Dr. Jitendra Singh Announces Historic Milestone: India Secures Exclusive Rights for Exploration of Polymetallic Sulphides in the Carlsberg Ridge in the Indian Ocean

India has significantly strengthened its position in the "Blue Economy" by securing exclusive rights for the exploration of **Polymetallic Sulphides (PMS)** in the **Carlsberg Ridge**, located in the Central Indian Ocean. This approval was granted by the **International Seabed Authority (ISA)** in 2024, with the exploration contract officially commencing for a 15-year period.



Understanding Polymetallic Sulphides (PMS)

Polymetallic Sulphides, also known as Seafloor Massive Sulphides (SMS), are mineral deposits formed by hydrothermal activity on the ocean floor, typically at mid-ocean ridges.

- a. Composition: They are rich in high-value metals including Copper, Gold, Silver, Zinc, and Lead.
- b. Formation: They precipitate from hot, mineral-rich fluids discharged from "black smokers" (hydrothermal vents) when they hit the cold seawater.
- c. The Carlsberg Ridge: This is the northern section of the Central Indian Ridge. It is a slow-spreading ridge, making it geologically ideal for the accumulation of large sulphide deposits.

**Day 11, 5 Daily Topics series, UPSC Prelims 2026,
By Abhishek sir**

51. Flexible Aluminium-Based Battery

52. Public Financial Asset Management (PFAM) Program 2025–26.

53. Semen Sex-Sorting technology

54. Exercise Pacific Reach 2025

55. Swasth Nari, Sashakt Parivar Abhiyaan

Learn topics and solve questions.

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Flexible Aluminium-Based Battery

Indian scientists develop flexible, safe, and eco-friendly battery: A big step towards sustainable energy

Q1. With reference to the recently developed flexible aluminum battery, consider the following statements:

1. It uses aluminum as the energy storage metal instead of lithium.
2. It uses a water-based electrolyte which improves safety.
3. The cathode material used is copper hexacyanoferrate.

Which of the statements given above are correct?

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

Answer: D

Who developed it?

Scientists from:

1. Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru
2. Centre for Nano Science and Engineering (CeNSE), IISc Bengaluru

CeNS is an autonomous institute under the Department of Science and Technology (DST).

Why is this battery important?

Most devices today use Lithium-ion batteries, but they have problems:

1. Risk of overheating
2. Explosion hazards
3. Lithium is costly and less abundant
4. Environmental concerns

The newly developed battery aims to solve these issues.

Key Features of the New Battery:

Flexible: Can bend or fold like paper.

Useful for:

1. Wearable electronics
2. Flexible devices
3. Future foldable gadgets.

Energy Efficient:

1. Can store and release energy efficiently.
2. May reduce power requirements of devices.

Public Financial Asset Management (PFAM) Program 2025-2026

Q1. Consider the following statements regarding the **Public Financial Asset Management (PFAM) Program 2025–26**.

1. It is aimed at strengthening the capacity of officials managing public financial assets such as central bank reserves and pension funds.
2. It is organized with the support of the World Bank.
3. Officials from India have participated in this programme.

Which of the statements given above are correct?

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

News:

EPFO Officer Selected for Prestigious World Bank – Milken Institute Program: A Landmark Global Collaboration by PDUNASS

Public Financial Asset Management (PFAM) Program 2025–26, a prestigious initiative jointly organised by the **World Bank** and the Milken Institute.

Hosted at Bayes Business School (formerly Cass), City, University of London, the Public Financial Asset Management (PFAM) Program is a globally recognised leadership initiative aimed at equipping senior professionals with cutting-edge expertise in capital markets, governance frameworks, and strategic asset management.

The 2025–26 cohort consists of 16 participants from 13 countries, including 11 from Central Banks, three from Sovereign Wealth Funds, and two from Pension Funds.

India participated in this programme.

Semen Sex-Sorting Technology

Q1. The primary objective of promoting sex-sorted semen in the Indian dairy industry?

1. To eliminate the need for artificial insemination in indigenous cattle.
2. To increase the population of female bovines to boost milk production and reduce the burden of male calves.

The technology is specifically aimed at creating a "female-only" calf population to maximize dairy efficiency and solve the crisis of abandoned male cattle.

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Q2. With reference to Sexed Semen Technology, consider the following statements:

1. The technology distinguishes between X and Y chromosomes based on the difference in their DNA content.
2. The Rashtriya Gokul Mission provides subsidies to farmers in India to promote the use of sex-sorted semen.

Both are correct.

In cattle, X-chromosome sperm contain about 3–4% more DNA than Y-chromosome sperm. This small DNA difference allows scientists to separate sperm carrying X or Y chromosomes.

Thus, sex determination is based on DNA content difference.

News:

Prime Minister Shri Narendra Modi Inaugurates ₹10-Crore Sex Sorted Semen Facility at Purnea, Bihar

Indigenous 'Gausort' Technology to Boost Dairy Sector in Eastern & North-Eastern India

Semen Sex-Sorting (also known as Sexed Semen Technology) is a specialized reproductive technique used in animal husbandry to pre-determine the sex of the offspring before conception. In the context of India's dairy sector, this technology is a major focus for increasing milk production and managing the stray cattle population.

Exercise Pacific Reach 2025

Q1. With reference to Exercise Pacific Reach 2025, consider the following statements:

1. It is a biennial multinational exercise focused on submarine escape and rescue (SMER) operations.
2. The 2025 edition was hosted by the Indian Navy in the Bay of Bengal.

Select the correct statement above.

INDIAN NAVAL SHIP NISTAR ENTERS CHANGI NAVAL BASE, SINGAPORE TO PARTICIPATE IN EXERCISE PACIFIC REACH 2025

Exercise Pacific Reach 2025, **being hosted by Singapore** will see participation of more than **40 nations** as active participants or as observers. The exercise will mainly be conducted in two phases viz. harbour and sea phase.

India's Participation: INS Nistar, India's newly commissioned (July 2025) indigenous Diving Support Vessel (DSV) served as the mothership.

Swasth Nari, Sashakt Parivar Abhiyaan

True or False.

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Q1. The Swasth Nari Sashakt Parivar Abhiyan will deploy more than one lakh health camps across Ayushman Arogya Mandirs and Community Health Centres?

Q2. The Swasth Nari Sashakt Parivar Abhiyaan is strategically aligned with existing government schemes such as Mission Shakti, which focuses on women's safety and empowerment?

Q3. The initiative is a joint venture between the Ministry of Health and Family Welfare and the Ministry of Women and Child Development?

Q4. The program aims to provide a life-cycle approach to women's health, covering adolescence, reproductive years, and menopause?

News:

Prime Minister Shri Narendra Modi to Launch Swasth Nari, Sashakt Parivar Abhiyaan, 8th Rashtriya Poshan Maah and Distribute PMMVY Benefits tomorrow

September 16, 2025

Key Takeaways

- The **Swasth Nari Sashakt Parivar Abhiyan** will deploy **more than one lakh health camps** across **Ayushman Arogya Mandirs** and **Community Health Centres**.
- The Abhiyan intends to ensure comprehensive screenings for women's health issues like **anaemia, hypertension, diabetes, and cancer**.
- One of the key objectives of the Abhiyan is to support **immunisation** efforts and **nutritional benefits** to **reduce maternal and child mortality rates**.
- The Abhiyan aims to operate on real-time monitoring via the **SASHAKT** portal to ensure transparency and efficiency.
- The **Swasth Nari Sashakt Parivar Abhiyan** has community support system as one of its pivotal components, with **Nikshay Mitras** being critical to the implementation of the scheme across the country.

Introduction

The **Swasth Nari Sashakt Parivar Abhiyaan (SNSPA)** is a landmark initiative by the **Ministry of Health and Family Welfare (MoHFW)** and the **Ministry of Women and Child Development (MoWCD)**, aimed at strengthening healthcare services for women and children across India, with a focus on improving access, quality care, and awareness. Described as a *Jan Bhagidaari Abhiyaan*, it encourages active participation from private hospitals and healthcare professionals to foster inclusive healthcare delivery.

The **Swasth Nari Sashakt Parivar Abhiyaan (SNSPA)** prioritises women's health by providing comprehensive health screenings and services tailored to their needs. Through health camps and other related initiatives, the campaign offers screenings for conditions like **dermatological concerns, hypertension, anaemia, reproductive health issues, breast and cervical cancer, diabetes, tuberculosis (TB), and sickle cell disease (SCD)**, with specialised counselling in tribal areas.

Day 12, 5-Topics daily series, UPSC Prelims 2026, By Abhishek sir.

56. India's first ICMR-SCD Stigma Scale for India (ISSSI).

57. UNESCO's Tentative List of World Heritage.

58. Industrial Park Rating System (IPRS) 3.0

59. Chief Science Advisers' Roundtable (CSAR) initiative.

60. Maitri 2.0 Programme

Learn topics and solve questions:

India's first ICMR-SCD Stigma Scale for India (ISSSI).

Q1. The ICMR-SCD Stigma Scale for India (ISSSI) primarily aims to measure which of the following aspects related to Sickle Cell Disease?

- a. Genetic mutation patterns responsible for the disease
- b. Effectiveness of new pharmaceutical treatments

- c. Psychosocial stigma and social barriers faced by patients
- d. Prevalence of the disease in tribal populations

Answer is c.

Study validates India's first ICMR-SCD Stigma Scale for sickle cell disease

ISSSI is the first in India and the fourth globally, available in clinical and research settings.

Updated - May 24, 2025 06:36 pm IST - NEW DELHI

The **ICMR-SCD Stigma Scale for India (ISSSI)**, launched in May 2025, is a pioneering tool designed to measure the psychosocial burden of Sickle Cell Disease (SCD) within the Indian context. It is the **first such tool in India** and only the **fourth globally**

The study was conducted across six SCD-endemic districts in India -- Alluri Seetharama Raju in Andhra Pradesh, Anuppur in Madhya Pradesh, Chhoteudepur in Gujarat, Kandhamal in Odisha, Mysuru in Karnataka, and Udalguri in Assam state.

Clinical Utility: It helps healthcare providers and policymakers understand why patients might avoid treatment or hide their condition, which is crucial for the success of the **National Sickle Cell Anaemia Elimination Mission 2047**.

UNESCO's Tentative List of World Heritage

1. As per UNESCO's protocol, Sites cannot be nominated for World Heritage listing without being on the Tentative List?
2. States Parties must submit the Tentative List to the World Heritage Centre at least one year before making a nomination?
3. The Tentative List is reviewed and finalized by UNESCO?

Nominations to the World Heritage List **will not be considered unless the nominated property has already been included on the State Party's Tentative List.**

States Parties are encouraged to prepare their Tentative Lists *with the participation of a wide variety of stakeholders, including site managers, local and regional governments, local communities, NGOs and other interested parties and partners.*

States Parties should submit Tentative Lists, which should not be considered exhaustive, to the World Heritage Centre, **at least one year prior to the submission of any nomination.**

The **Tentative List is prepared, reviewed, and submitted by the concerned State Party (country) itself, not by UNESCO.**

Seven Natural Heritage Sites from India Added to UNESCO's Tentative List of World Heritage

- ✓ 1. **Deccan Traps at Panchgani and Mahabaleshwar, Maharashtra :** These are the massive Deccan Traps and are located within the Koyna Wildlife Sanctuary.
- ✓ 2. **Geological Heritage of St. Mary's Island Cluster, Karnataka:** Known for its Cretaceous period, offering a geological snapshot from around 85 million years ago.
- ✓ 3. **Meghalayan Age Caves, Meghalaya:** The stunning cave systems formed during the Meghalayan Age in the Holocene Epoch, reflecting significant climate changes.
- ✓ 4. **Naga Hill Ophiolite, Nagaland:** A rare exposure of ophiolite rocks, providing insights into tectonic processes and mid-ocean ridge dynamics.
- ✓ 5. **Erra Matti Dibbalu (Red Sand Hills), Andhra Pradesh:** These unique coastal geomorphological features that reveal Earth's climatic history.
- ✓ 6. **Natural Heritage of Tirumala Hills, Andhra Pradesh:** Featuring ancient rock formations of immense geological significance, representing over 1.5 billion years of Earth's history.
- ✓ 7. **Varkala Cliffs, Kerala:** The scenic cliffs along Kerala's coastline exhibit unique erosional landforms offering both scientific and touristic value.

With this inclusion, UNESCO's Tentative List of World Heritage Sites, increasing India's count on the Tentative List from **62 to 69 properties**.

Industrial Park Rating System (IPRS) 3.0

Q1. IPRS was developed by Department for Promotion of Industry and Internal Trade (DPIIT) with support from the World Bank?

Developed by the **Department for Promotion of Industry and Internal Trade (DPIIT) with support from the Asian Development Bank (ADB)**, the initiative aims to further strengthen India's industrial ecosystem and enhance the competitiveness of industrial infrastructure.

Q2. Consider the following statements regarding the **Industrial Park Rating System (IPRS) 3.0**:

1. Participation in the rating system is voluntary for industrial parks.
2. It aims to create a competitive environment among industrial parks by benchmarking their performance.
3. The system only evaluates parks located within Special Economic Zones.

Which of the statements given above are correct?

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

Statement 1 is Correct: Participation in the IPRS 3.0 is voluntary. Industrial parks, whether managed by state government agencies or private developers, choose to participate to benchmark their infrastructure and improve their visibility to global investors.

Statement 2 is Correct: The primary objective of the IPRS is to foster a competitive spirit among states and developers. By ranking parks as 'Leaders,' 'Challengers,' or 'Aspirants,' it encourages them to upgrade their facilities to attract more investments.

Statement 3 is Incorrect: The system is comprehensive. It evaluates a wide range of industrial areas, including State Industrial Development Corporations (SIDCs), private industrial parks, and Special Economic Zones (SEZs). It is not restricted solely to SEZs.

Chief Science Advisers' Roundtable (CSAR)

Q1. With reference to the Chief Science Advisers' Roundtable (CSAR), consider the following statements:

1. The initiative was conceptualised during India's G20 Presidency in 2023?
2. It was spearheaded by the Office of the Principal Scientific Adviser to the Government of India?

Statement 1 is correct: The G20 Chief Science Advisers' Roundtable (CSAR) was indeed a "unique" initiative conceptualized and launched during India's G20 Presidency in 2023. It aimed to create an institutional mechanism for global science advice.

Statement 2 is correct: The initiative was spearheaded by the Office of the Principal Scientific Adviser (OPSA) to the Government of India. It was designed to address trans-border issues through science diplomacy.

From the news:

2025 edition of Chief Science Advisers' Roundtable (CSAR) concludes with a successful adoption of the outcome document on "Equity-Based Science, Technology and Innovation for Inclusive Human Development and Global Sustainability"

The 2025 edition of Chief Science Advisers' Roundtable (CSAR) with a focus on "*Equity-based Science, Technology and Innovation for Inclusive Human Development and Global Sustainability*", convened under the South Africa's G20 Presidency, on 21 September 2025, in **Pretoria, South Africa**.

The Department of Science, Technology and Innovation (DSTI), in collaboration with its entity, the National Advisory Council on Innovation (NACI), hosted the G20-CSAR 2025.

The initiative was conceptualised during India's G20 Presidency in 2023, **spearheaded by the Office of the Principal Scientific Adviser (OPSA) to the Government of India**.

The 2024 edition of CSAR was collaboratively hosted by OPSA and UNESCO in Paris, France, with an extended scope and participation. G20-CSAR provides a platform to discuss and devise common frameworks to address some of the pressing policy challenges through inclusive global science advice.

Maitri 2.0 Programme

Q1. Consider the following statements regarding the Maitri 2.0 Programme:

1. It is a bilateral cross-incubation initiative between India and Australia focusing on critical minerals.
2. It aims to foster a Startup ecosystem in the field of agritech through joint mentorship and market access.

Which of the statements given above is/are correct?

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

The first MAITRI program was launched in the year 2019, in collaboration with the Embassy of Brazil, New Delhi and ICAR-Indian Institute of Millets Research (IIMR), Hyderabad with support from the Department of Science and Technology (DST), GoI.

MAITRI 2.0 was launched on 22 September 2025, aimed at deepening collaboration between India and Brazil in the field of Agri-tech innovation. Building on the success of the first MAITRI program in 2019–2021, this edition focused on agri-incubators, which are vital to a thriving start-up ecosystem.

Only second statement is correct.

Day 13, 5 topics daily series, UPSC PRELIMS 2026, By Abhishek Sir.

61. System of Environment Economic Accounts (SEEA) Framework

62. Children in India 2025: Report.

63. Swappable Battery technology

64. Cell2Sentence-Scale (C2S-Scale)

65. India-Israel-UAE-USA (I2U2) initiatives

Learn topics and solve few questions.

System of Environment Economic Accounts (SEEA) Framework

News:

In 2025, the Ministry of Statistics and Programme Implementation (MoSPI) compiled and released the 8th consecutive issue of the publication related to environment accounts titled "Environmental Accounting on forest -2025" on 25th September, 2025 during Inaugural session of 29th Conference of Central and State Statistical Organizations (CoCSSO) held on 25-26th September 2025 in Chandigarh.

*This is the first dedicated publication on forest accounting compiled with the objective of presenting comprehensive information on forest accounts at both the national and state levels, in accordance with the **SEEA framework**.*

Q1. The SEEA Central Framework has been adopted as an international statistical standard by the United Nations Statistical Commission?

Answer:

The SEEA Central Framework was adopted by the United Nations Statistical Commission (UNSC) at its 43rd session in **2012** as the first international statistical standard for environmental-economic accounting. It is a multipurpose conceptual framework that uses the same accounting principles as the System of National Accounts (SNA). In **2025–2026**, it is currently undergoing a "Tranche-based" update to align with new global biodiversity and climate goals.

Q2. SEEA Ecosystem Accounting primarily focuses on measuring ecosystem extent, ecosystem condition and ecosystem services.

Answer:

SEEA Ecosystem Accounting (SEEA EA), adopted as a standard in **2021**, explicitly focuses on **Ecosystem Extent** (area), **Ecosystem Condition** (health/integrity), and **Ecosystem Services** (the benefits flow like water filtration or carbon storage). It takes a "spatial" approach, mapping these factors across landscapes.

Q3. India is not a participant in SEEA and does not undertake any form of environmental-economic accounting?

Answer:

India is actually a **leading participant** in the SEEA framework. The **Ministry of Statistics and Programme Implementation (MoSPI)** adopted the **UN System of Environmental Economic Accounts (SEEA) Framework** in 2018 which is an agreed international framework for the compilation of the Environment Economic accounts since.

Children in India 2025: Report

The Ministry of Statistics and Programme Implementation (MoSPI) has been releasing an *ad-hoc* publication titled "Children in India" since 2008. The "**Children in India 2025**" is the fourth such publication on the status of children in India.

I won't ask you question here. Just go through these 4 points as per the report:

1. Infant Mortality Rate (IMR) has shown decreasing trend, which was 44 in 2011 and has decreased to 25 in 2023.
2. Dropout Rate has decreased from 13.8 in 2022-23 to 8.2 in 2024-25.
3. The percentage of women aged 20-24 years who had married before the of age 18 years has reduced from 26.8 in 2015-16 to 23.3 in 2019-21.
4. The total number of children adopted has increased from 3927 in 2017-18 to 4515 in 2024-25.

Swappable Battery technology

Swappable battery technology, also known as *Battery-as-a-Service (BaaS)*, allows electric vehicles to exchange depleted batteries for fully charged ones at battery swapping stations.

Read the below paragraphs taken from NITI Aayog draft policy.

EVs are traditionally purchased with "fixed" batteries which can only be charged using the power supply while housed within the EV. Like fueling stations for ICE vehicles, adequate, affordable, accessible, and reliable charging networks are a pre-requisite for mass EV adoption. Efforts are underway in India to boost the availability of charging infrastructure¹. Charging still takes significantly longer than refueling an ICE.

Battery swapping is an alternative which involves exchanging discharged batteries for charged ones and provides flexibility to charge them separately. This de-links charging and battery usage and keeps the vehicle in operational mode with negligible downtime. Battery swapping is generally used for smaller vehicles such as 2Ws and 3Ws with smaller batteries that are easier to swap, compared to 4 wheelers

and e-buses, although solutions are emerging for the latter segments as well. Battery swapping offers three key advantages relative to charging: it is time, space, and cost efficient, provided each swappable battery is actively used.

- With existing technologies for e-2Ws and e-3Ws, regular charging takes at least 3 to 4 hours, adding to inconvenience and creating range anxiety. The resulting vehicle downtime is particularly significant for freight and shared mobility vehicles. Whereas, battery swapping is done in minutes, as the batteries are pre-charged in swapping stations.
- Charging stations require more space, since vehicles need to be parked next to the chargers during the charging process. Battery swapping stations can stack multiple batteries on top of each other, and require limited parking, which would address space constraints in urban areas.
- While battery swapping involves a greater number of batteries than conventional batteries, each swappable battery can be smaller in capacity (kWh), since range anxiety is a smaller concern.

Battery swapping falls under the broader umbrella of Battery as a Service (BaaS) business models which involve users purchasing an EV without the battery, which significantly lowers upfront costs, and paying a regular subscription fee (daily, weekly, monthly, etc.) to service providers for battery services throughout the vehicle lifetime. BaaS is applicable for both fixed and removeable batteries and is the channel to implement swapping solutions.

Now solve few questions:

Q1. With reference to battery swapping for electric vehicles, consider the following statements:

1. Battery swapping allows a discharged battery to be exchanged for a fully charged one at a swapping station.
2. Battery swapping delinks battery charging from vehicle usage.
3. Battery swapping eliminates the need for charging infrastructure.

Which of the statements given above are correct?

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

Answer: (a)

Explanation

1 – Correct: A depleted battery is replaced with a charged one.

2 – Correct: Charging occurs separately at swapping stations.

3 – Incorrect: Charging infrastructure is still needed to charge stored batteries.

Q2. Battery swapping technology is currently most suitable for which of the following electric vehicle categories?

1. Electric two-wheelers
2. Electric three-wheelers
3. Heavy electric trucks
4. Electric buses

Select the correct answer:

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

Answer: (a)

Explanation

Battery swapping is mainly used for smaller vehicles:

2-wheelers and 3-wheelers → smaller batteries, easy swapping

Heavy vehicles and buses → larger batteries, swapping is more complex (though solutions are emerging).

Q3. Which of the following statements correctly describe the differences between conventional EV charging and battery swapping?

1. Conventional EV charging requires vehicles to remain stationary for the duration of charging.
2. Battery swapping reduces vehicle downtime compared to regular charging.
3. Battery swapping requires larger batteries than conventional EV systems.

Select the correct answer:

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

Answer: (a)

Explanation

1 – Correct: Vehicle must stay connected to charger.

2 – Correct: Swap takes minutes.

3 – Incorrect: Swappable batteries are often smaller in capacity.

Q4. In battery swapping systems, the swappable batteries are often designed with smaller capacity because:

- a. They rely entirely on renewable energy sources
- b. Vehicles using swapping stations face lower range anxiety
- c. Battery swapping eliminates electricity consumption
- d. Smaller batteries improve EV speed

Answer: (b)

Explanation

Since batteries can be swapped quickly, range anxiety is reduced, allowing smaller battery capacity (kWh).

Cell2Sentence-Scale (C2S-Scale)

Q1. Consider the following statements regarding the **C2S-Scale model**:

1. It is a foundation model that translates numerical gene expression data into textual "cell sentences" to leverage the power of Large Language Models.
2. The model was developed by the Indian Council of Medical Research (ICMR) as part of the Genome India Project.

Which of the statements given above is/are correct?

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

Cell2Sentence-Scale (C2S-Scale) is a **state-of-the-art AI foundation model** launched in late 2025 by **Google DeepMind and Google Research in collaboration with Yale University**. It represents a revolutionary shift in genomics by treating the biological "language" of cells exactly like human language.

Built upon the **Gemma-2 architecture**, the flagship version boasts 27 billion parameters, making it one of the largest and most powerful models ever dedicated to single-cell biology.

Traditionally, *single-cell RNA sequencing (scRNA-seq) data is treated as a massive, high-dimensional matrix of numbers (gene expression levels)*. C2S-Scale simplifies this using the Cell2Sentence (C2S) framework:

1. **Rank-Ordering:** For an individual cell, thousands of genes are ranked by their expression level (from highest to lowest).
2. **Tokenization:** The gene names are then converted into a text string—a "cell sentence"—where the space-separated gene names serve as "words."
3. **Language Processing:** Because the data is now text, the model can apply standard Large Language Model (LLM) techniques to "read" the cell's state, "write" predicted responses, and reason about biological context.

India-Israel-UAE-USA (I2U2) initiatives

Q1. Members name?

Q2. When it was formed?

Q3. With reference to the formation of the **I2U2 Group**, consider the following objectives:

- a. To mobilize joint investments and identify bankable projects in sectors such as water, energy, transportation, space, health, food security and technology.
- b. To establish a collective military alliance for maritime security operations in the Indian Ocean and Mediterranean Sea.
- c. To create a common currency and customs union among the member countries for deeper economic integration.
- d. To coordinate nuclear non-proliferation monitoring mechanisms in West Asia under a new multilateral treaty framework.

Read.

The heads of government of India, Israel, the United Arab Emirates (UAE), and the United States convened the first leaders' summit on July 14, 2022, to establish the I2U2 Group. This unique grouping of countries identifies bankable projects and initiatives to tackle some of the greatest challenges confronting our world, with a particular focus on joint investments and new initiatives in water, energy, transportation, space, health, food security, and technology.

The Group aims to mobilize private sector capital and expertise to achieve a variety of goals, including modernizing infrastructure, advancing low carbon development pathways, and improving public health. I2U2 partnership projects and initiatives are not limited in geographic scope – the Group will explore opportunities anywhere it can make a positive impact.

Leadership

The I2U2 Group is currently being led by senior government representatives of each partner country, including the following four high-level officials, who work together closely and report back to the heads of government.

Day 14, 5 topics daily series, UPSC PRELIMS 2026, By Abhishek sir

66. *Project Silica*

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67. UN Women's flagship capacity-building programme — SheLeads II

68. UNCLOS

69. Learn Iran

70. ICMR-SHINE initiative

Learn topics with questions.

Project Silica

Q1. It is a joint initiative of the World Economic Forum and Google to create a global digital library?

Q2. It uses high-energy infrared lasers to melt data into the surface of optical fibre cables for faster internet transmission?

Both are incorrect. Project Silica is about **storage**, not transmission.

Project Silica is a **Microsoft Research initiative** designed to revolutionize long-term data storage by using **femtosecond lasers** to etch data into **quartz glass**. It is specifically built for "archival" or "cold" data—information that must be preserved for centuries but doesn't need to be accessed frequently.

Why Glass?

- a. **Durability:** Quartz glass is resistant to water, heat, radiation, and electromagnetic pulses (EMP). It can withstand being boiled, baked, or scoured without data loss.
- b. **Longevity:** While a typical hard drive might last 5 years and magnetic tape 10–20 years, Project Silica is designed to last thousands of years.

Women flagship capacity building programme- SheLeads II

Q1. Consider the following statements regarding the 'SheLeads II' programme:

1. It is a joint initiative of the World Bank and the IMF to promote women's entrepreneurship in the tech sector.
2. It focuses on building the capacity of women to take up leadership roles in political and decision-making processes.

Which of the statements given above is/are correct?

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

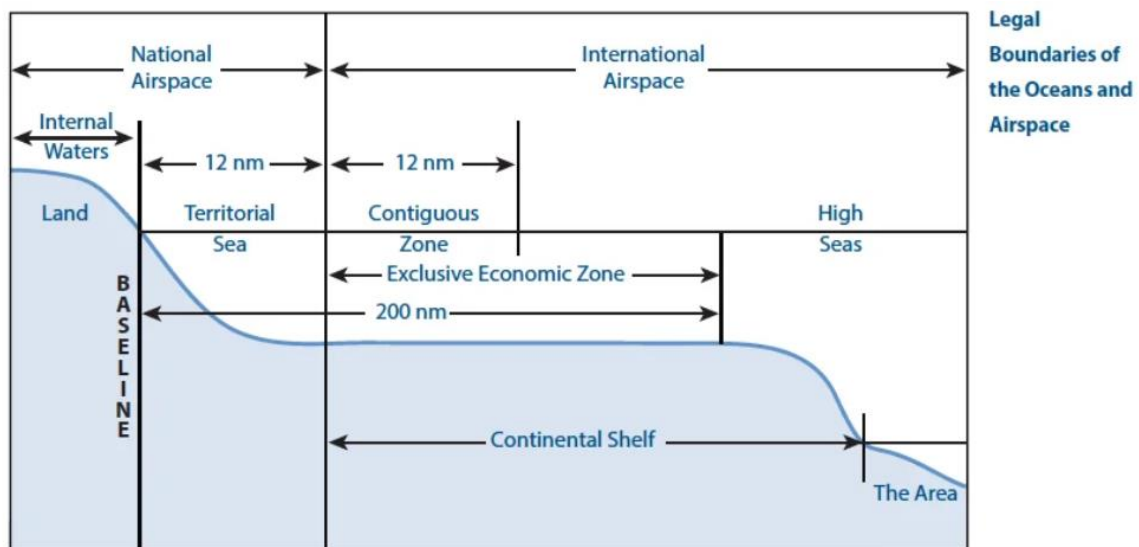
Solution: b

Union WCD Minister, Smt. Annpurna Devi inaugurates second edition of UN Women's flagship capacity-building programme — SheLeads II: Workshop for Women Leaders

SheLeads is a flagship initiative of UN Women India Country Office, aimed to advance gender equality in public and political leadership, aiming to support women leaders in contesting the upcoming/next Lok Sabha and State Assembly elections.

UNCLOS

Q1. According to the UNCLOS, the Exclusive Economic Zone (EEZ) of a country extends from the baseline of its coast to 200 nautical miles (about 370 km) into the sea? Yes.



Q2. The United Nations Convention on the Law of the Sea was entered into force in 1994?

The United Nations Convention on the Law of the Sea was adopted in 1982 and entered into force in 1994. It lays down a comprehensive regime of law and order for the world's oceans, establishing rules for the allocation of States' rights and jurisdiction in maritime spaces, the peaceful use of the oceans and the management of their resources. The Convention also provides a framework for the further development of specific areas of the law of the sea, including through the work of competent international organizations such as IMO. The regime originally laid down in the Convention has since been expanded through the following instruments, to accommodate the priorities of States and fill in gaps in the regulatory framework:

Q3. A coastal state has full sovereignty over the airspace above its EEZ, similar to its territorial sea?

In the Territorial Sea (up to 12 nautical miles), a coastal state has full sovereignty, including over waters, seabed, subsoil, and the airspace above.

In the Exclusive Economic Zone (up to 200 nautical miles), **the coastal state does not have full sovereignty**. It only has sovereign rights for exploration, exploitation, conservation, and management of natural resources.

Q4. With reference to 'Innocent Passage' under the United Nations Convention on the Law of the Sea, which one of the following statements best describes it?

- a. The right of all ships to freely exploit natural resources in the Exclusive Economic Zone of another state.
- b. The right of ships of all states to pass through the territorial sea of a coastal state so long as the passage is not prejudicial to its peace, good order or security.
- c. The right of warships only to navigate through international straits without prior permission of coastal states.
- d. The right of coastal states to restrict navigation in the high seas for environmental protection.

Solution: b

Explanation:

Under UNCLOS, **innocent passage** allows ships of all states to **navigate through the territorial sea of another state**, provided they do not threaten the **peace, good order, or security** of the coastal state.

Map of Iran

Q1. Iran shares its longest land border with Iraq to the West?

Q2. It shares a land border with both Afghanistan and Pakistan to the East?

Q3. Iran is the only country that borders both the Caspian Sea and the Persian Gulf?

Q4. Which of the following mountain ranges forms the northern rampart of Iran, separating the Iranian Plateau from the Caspian Sea?

- a. Zagros Mountains
- b. Alborz Mountains**
- c. Hindu Kush
- d. Caucasus Mountains

Q5. Lake Urmia, an endorheic Salt Lake that has faced significant shrinkage in recent decades, is located in which part of Iran?

- a. Southeast (near Pakistan border)
- b. Northwest (near Turkey border)**
- c. Central Plateau
- d. Southern Coast

Q6. Which of the following countries lies to the northwest of Iran?

- a. Armenia**
- b. Qatar
- c. Kuwait
- d. Yemen

Q7. Which of the following water bodies lies south of Iran?

- a. Persian Gulf
- b. Red Sea
- c. Mediterranean Sea
- d. Black Sea

Answer: A

Explanation:

Iran's southern coastline is along the Persian Gulf and the Gulf of Oman.

ICMR-SHINE Initiative

Q1. Consider the following statements regarding the **S.H.I.N.E. initiative**:

- 1. It is a joint initiative aimed at promoting scientific curiosity and health innovation among school and college students.
- 2. The program is implemented by the ICMR in collaboration with the National Health Authority (NHA).

Which of the statements given above is/are correct?

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

Answer: c

Explanation:

Both statements are correct. The initiative targets "Nextgen Explorers" (youth) and involves cooperation between India's apex medical research body and the authority managing the national digital health ecosystem.

S.H.I.N.E. – Science, Health and Innovation for Nextgen Explorers.

Through the S.H.I.N.E. initiative, ICMR reaffirmed its commitment to fostering scientific curiosity among young learners and promoting awareness of the vital role of research in advancing public health.

The **S.H.I.N.E. (Science, Health and Innovation for Nextgen Explorers)** initiative is a pioneering program launched by the **Indian Council of Medical Research (ICMR)** to foster a spirit of inquiry and innovation among the youth.

**Day 15, 5 topics daily series, UPSC PRELIMS 2026,
By Abhishek sir**

71. CATCH Grant Program

72. Japan's SAUTOUMI Initiative

73. Stable coins

74. UN'S Global Water Bankruptcy Report

75. Oxygen rich Mira star variable

Now, learn topics and solve few questions. Today we have less questions.

CATCH Grant Program

Q1. The CATCH Grant Program, sometimes mentioned in news, primarily seeks to:

- a. Promote indigenous manufacturing of chemotherapy drugs
- b. Encourage AI-driven innovations for cancer detection and treatment
- c. Develop nuclear medicine infrastructure in government hospitals
- d. Establish cancer vaccine manufacturing units in India

CATCH Grant Program stands for **Cancer AI & Technology Challenge (CATCH)**. It is a **competitive innovation grant program launched in 2025** to promote the use of **Artificial Intelligence (AI)** in **cancer care in India**.

Launched by **IndiaAI (under the Ministry of Electronics & IT)** in collaboration with the **National Cancer Grid (NCG)**.

Japan's SAUTOUMI Initiative

I just want you to read this small paragraph below. No questions.

In February 2025, the Japanese government announced a [new climate action plan](#) that sets targets to increase CO2 absorption from blue carbon ecosystems to 1 million tons by fiscal year 2035 and 2 million tons by fiscal year 2040.

Central to this ambition is the restoration and creation of seagrass meadows, alongside the expansion of the “J Blue Credit system” to offset emissions.

These efforts are grounded in the concept of “satoumi,” which is a model of coastal stewardship in which healthy marine ecosystems and human livelihoods coexist in balance.

Under this framework, Japan’s Ministry of the Environment promotes the conservation, restoration and creation of seagrass beds and tidal flats, while leveraging local industries and community participation to address environmental, economic and social challenges simultaneously.

Stable coins

Q1. RBI has recently released the draft policy framework on utilizing Stablecoins in India?

RBI Deputy Governor rules out stablecoins in India

“Cryptocurrency is not money as they do not have any underlying cash flows,” says Deputy Governor T. Rabi Sankar

Q2. Stablecoin is a type of cryptocurrency whose value is linked to a stable asset such as fiat currency?

Q3. Stable coin could lead to price volatility and reduce the capability of the central bank to conduct monetary policy?

Q4. Currently, cryptocurrency is not legal but is subject to taxes on transactions that involve it?

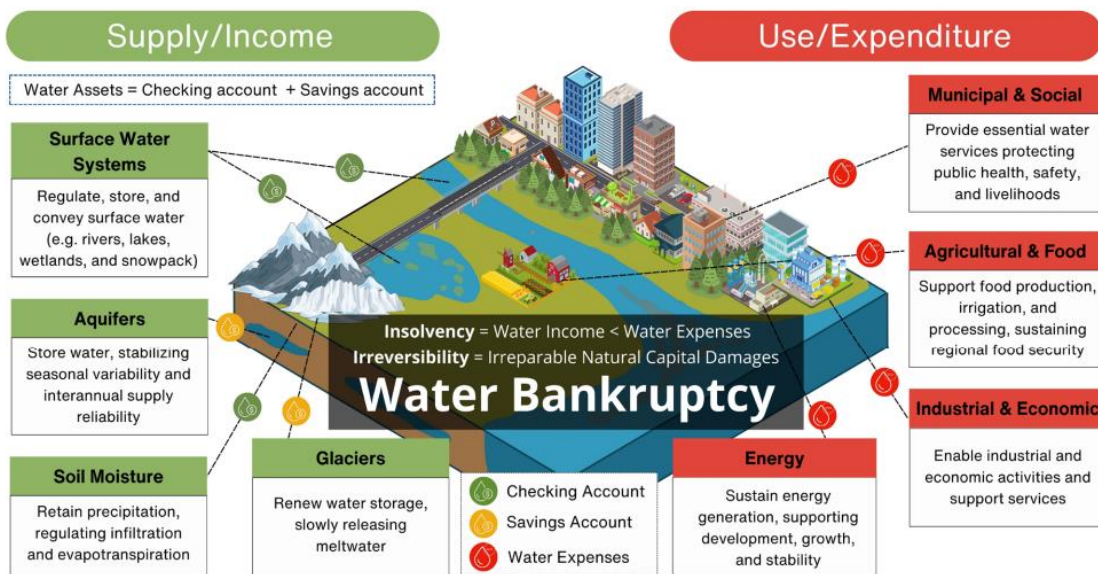
2, 3 AND 4 ARE CORRECT.

Q5. They fall under the definition of 'currency' as provided under Section 2(h) of the Foreign Exchange Management Act, 1999? No.

They do not fall under the definition of 'currency' as provided under Section 2(h) of the Foreign Exchange Management Act, 1999 ("FEMA") as they are neither currency notes, postal notes, postal orders, money orders, cheques, drafts, travelers cheques, letters of credit, bills of exchange and promissory notes or credit cards nor have they have been notified by RBI as currency separately.

UN'S Global Water Bankruptcy Report

The **UNU-INWEH** (United Nations University Institute for Water, Environment and Health) released its flagship report, *"Global Water Bankruptcy: Living Beyond Our Hydrological Means in the Post-Crisis Era,"* on **January 20, 2026**.



A simple illustration of water income and water expenses in a human-water system. Water bankruptcy is the outcome of both insolvency and irreversibility conditions, i.e., when water use (expenditure) exceeds water supply (renewable and non-renewable assets) for an extended period resulting in irreparable damages to the underlying natural capital that contributes to water production and stability of the hydrological cycle.

Key Findings & Global Impact:

- Widespread Insecurity:** Approximately 75% of the global population lives in countries classified as water-insecure or critically water-insecure.
- The Scarcity Reality:** Around 4 billion people experience severe water scarcity for at least one month every year.
- Ecological Loss:** More than half of the world's large lakes have shrunk since the 1990s. Additionally, the world has lost 410 million hectares of natural wetlands over the last 50 years—an area nearly the size of the European Union.
- Groundwater Depletion:** Roughly 70% of major aquifers are in long-term decline. Over-pumping has caused land subsidence (sinking) across 6 million square kilometers, affecting nearly 2 billion people.

No need for any question.

- e. Cryosphere Collapse: The world has lost more than 30% of its glacier mass since 1970, threatening the water security of hundreds of millions who rely on glacier-fed rivers.

Oxygen rich Mira star variable

Wonderful Cool Mira Stars Anchor an independent Rate of Cosmic Expansion

New study from IUCAA, with a Nobel laureate as a co-author, uses oxygen-rich Mira variable stars to achieve highly precise measurement of the Hubble constant.

The article in PIB discusses a significant breakthrough in astrophysics led by the Inter-University Centre for Astronomy and Astrophysics (IUCAA). The study utilizes Mira variable stars to measure the **Hubble constant**, which represents the rate at which the universe is expanding.

What are Mira Stars?

Mira variable stars are cool red giant stars whose brightness changes periodically.

Key features:

- f. They expand and contract (pulsate).
- g. Because of this pulsation, their brightness varies regularly.
- h. Their pulsation period is related to their true brightness.

This relationship helps astronomers calculate distance in space.

Why is distance important?

To measure how fast the universe is expanding, scientists must know:

- a. **Distance of galaxies**
- b. **Speed at which they are moving away**

Distance measurements use something called the cosmic distance ladder.

First understand the old method:

To measure how fast the Universe is expanding (the Hubble Constant), astronomers must measure distances to faraway galaxies. For this they use special stars whose brightness changes.

Earlier scientists mostly used Cepheid variable stars. Cepheids act like “standard candles” because their pulsation period tells us their real brightness.

But there is a problem:

Cepheid brightness changes depending on metal content of the star. This can introduce errors in distance measurement

What is NEW in this research?

A different type of star is used. Instead of Cepheids, **the study used Mira variable stars**.

This is the first time Mira stars inside our galaxy were used as the main reference (anchor) to measure cosmic distances.

- a. More reliable brightness measurement.
- b. Independent way to measure cosmic expansion.
- c. Very precise measurement.

UPSC has a history of testing stellar objects.

Prelims 2023: A question asked to match space objects with their descriptions (Cepheids, Nebulae, and Pulsars).

Direct Relevance: Mira variables are now being presented as a superior alternative to Cepheids (which appeared in that 2023 question).

Prelims 2024: A question used Statement-I and Statement-II to compare Giant stars and Dwarf stars.

Direct Relevance: Mira stars are "Red Giants," and understanding their life cycle (Asymptotic Giant Branch) is a direct extension of this trend.

Prelims 2021: A question asked why astronomical distances are measured in light-years.

Day 16, 5 topics daily series, UPSC PRELIMS 2026, By Abhishek sir

76. India-Arab Delhi Declaration

77. Orobanche (Broomrape) in Mustard Cultivation

78. World Bank Poverty and Equity Brief (October 2025 report)

79. Joint Vision for the Next Decade: "Eight Directions to Steer the Special Strategic and Global Partnership"

80. SCOPE Eminence Awards

India-Arab Delhi Declaration

Q1. Second India–Arab Foreign Ministers' Meeting (2026) was held in New Delhi and was co-chaired by the United Arab Emirates?

Q2. The Declaration aims to strengthen cooperation between India and the Arab League in areas such as economy, energy, education, media and culture.

Q3. India is a full member of the Arab League.

Q4. The Arab League was formed in 1945 in Cairo, initially with seven members.

The **Delhi Declaration** was adopted during the **Second India-Arab Foreign Ministers' Meeting** held in New Delhi on January 31, 2026. The meeting was co-chaired by UAE.

The Delhi Declaration boosts India-Arab League cooperation in five key areas — economy, energy, education, media and culture. The Declaration looks to boost such cooperation on the back of trade between India and Arab countries, which is more than \$240 billion.

The Arab League was formed in Cairo on 22nd March, 1945, initially with seven members to promote the various interests of these nations. Currently, the League has 22-member states from the Arab world including countries from North Africa and Middle East.

Alexandria Protocol, signed on October 7, 1944, in Alexandria, Egypt, provided the essential framework for creating the Arab League.

India is an observer to Arab League, not member.

Orobanche (Broomrape) in Mustard Cultivation

Q1. Consider the following statements regarding *Orobanche*:

1. It is a total root parasite that lacks chlorophyll and cannot perform photosynthesis.
2. It primarily spreads through wind-borne spores that infect the leaves of the mustard plant.

Which of the statements given above is/are correct?

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

Solution: a

India's largest oilseed crop is facing a serious menace from *Orobanche*, a parasitic weed that has inflicted damage in major mustard-growing areas of Rajasthan and Haryana.

Unlike most plants, *Orobanche* lacks chlorophyll and cannot perform photosynthesis. It survives by attaching its roots to the host plant's root system via a specialized organ called a **haustorium**, through which it drains water and nutrients. This leads to severe stunting and yield losses ranging from **20% to 50%**, and in extreme cases, total crop failure.

World Bank Poverty and Equity Brief (October 2025 report)

Learn about these reports only what is written in reference to India. The report says:

From 2011–12 to 2022–23, the share of people living below the poverty line dropped from 57.7 percent to 23.9 percent.

Q1. Both rural and urban areas experienced poverty reduction? YES.

Q2. More than 80 percent of reduction was seen in rural areas, urban poverty decreased around 20 percent? No.

Both rural and urban areas experienced poverty reduction, each with distinct labor market trends. **Rural poverty decreased from 64.9 percent to 27.7 percent** (7.4 percent annually), accompanied by a rise in self-employment, which accounted for 53 percent of paid employment by 2023–24.

Urban poverty fell from 39.7 percent to 14.3 percent (8.9 percent annually). Extreme poverty (\$3 per day) also fell, from 27.1 percent to 5.3 percent. Social transfers, such as subsidized food, contributed to poverty reduction across regions and demographic groups.

Q3. Rural poverty reduction was accompanied by a rise in self-employment? Yes.

Q4. The number of women in paid self-employment has nearly tripled since 2017–18? Yes.

Q5. While most states saw poverty decline, it remains concentrated: in 2022–23, 46 percent of India's poor lived in three states? **Uttar Pradesh, Bihar, and Maharashtra**

Q6. Madhya Pradesh and Manipur reducing poverty faster than the national average? Yes

Q7. Non-monetary poverty, as measured by the MPI, fell from 53.8 percent in 2005–06 to 16.4 percent in 2019–21? Yes.

Read more:

- Despite overall progress, access to services varies widely, with multidimensional poverty below 1 percent in Kerala and as high as 35 percent in Bihar.
- India's consumption-based Gini index improved from 28.8 in 2011–12 to 25.5 in 2022–23, though inequality may be understated due to data limitations.
- In contrast, the World Inequality Database reports rising income inequality, with the Gini increasing from 52 in 2005 to 61 in 2023.
- Wage disparities remain significant, with median earnings of the top 10 percent being 13 times higher than those of the bottom 10 percent in 2023–24, underscoring persistent labor market inequalities despite gains in poverty reduction.

Joint Vision for the Next Decade: *Eight Directions to Steer the Special Strategic and Global Partnership*

Q1. This vision is between which countries:

India - Japan Joint Vision for the Next Decade: Eight Directions to Steer the Special Strategic and Global Partnership

- Next Generation Economic Partnership
- Next Generation Economic Security Partnership
- Next Generation Mobility

4. Next Generation Ecological Legacies
5. Next Gen Technology and Innovation Partnership
6. Investing in Next Gen Health
7. Next Gen People-to-People Partnership
8. Next-Gen State-Prefecture Partnership

Nothing much here needed.

SCOPE Eminence Awards

PRESIDENT OF INDIA PRESENTS SCOPE EMINENCE AWARDS

CPSEs WILL PLAY AN IMPORTANT ROLE IN ACHIEVING THE NATIONAL GOAL OF BUILDING A DEVELOPED INDIA BY THE YEAR 2047: PRESIDENT MURMU

The **SCOPE Eminence Awards** are the highest honors bestowed upon Public Sector Enterprises (PSEs) in India. Organized by the **Standing Conference of Public Enterprises (SCOPE)**—the apex professional body of the Central Public Sector Enterprises (CPSEs)—these awards recognize excellence in various facets of governance, innovation, and social responsibility.

No questions here.

**Day 17, 5 topics daily series, UPSC Prelims 2026,
By Abhishek sir.**

81. Green Steel

82. National Sports Policy 2025

83. 75th Anniversary of the National Sample Survey (NSS)

84. National Industrial Classification (NIC) 2025

85. Tropical Forests Forever Facility (TFFF)

Learn topics today. No questions today.

Green Steel

India and UAE Explore Collaboration in Green Steel and High-Grade Aluminium

Union Minister H.D. Kumaraswamy Meets UAE Economy Minister to Boost Industrial & Mineral Partnerships

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There are no questions today. Just read this topic.

In December 2024, the Ministry of Steel **introduced the Green Steel Taxonomy Framework (GSTF)**, India's first comprehensive system for defining, verifying, and classifying "green" steel based on emission thresholds of crude steel.

2. Key Features of the ~~Green~~ Steel Taxonomy Framework

The GSTF establishes a five-tier certification system based on verified emission intensity, measured in tonnes of CO₂ per tonne of crude steel (tCO₂/tcs). The classification is reviewed every *three years* and audited through the NISST.

The taxonomy also mandates a *third-party MRV; Measurement, Reporting and Verification* mechanism conducted by accredited verifiers recognised by NISST. Producers must submit an annual *Green Steel Declaration Form* specifying production volumes, energy mix, and verified emission intensity. Data integrity is assured through randomised audits and digital reporting integration with the *Steel Data Portal* maintained by the Ministry. Non-compliance or misrepresentation invites penalties under the *Environment (Protection) Act, 1986*, and can result in suspension of green certification.²

From a legal-governance standpoint, the **taxonomy does more than categorise**, it creates a *compliance interface between environmental law, industrial licensing, and public-procurement obligations*.

Once the 2027–28 mandate comes into effect, adherence to a minimum "3-Star" standard will likely become a pre-qualification criterion in central and PSU tenders.

And also, The **National Steel Policy 2017 aims to increase India's crude steel capacity to 300 million tonnes by 2030**. According to ministry, UAE can play a key role in helping India reach its 300 million tonne steel production targets by 2030, particularly by supporting raw material security and enabling energy-efficient production systems.

One basic question:

Q1. Green Hydrogen can be used as a "reducing agent" in the steel-making process to replace which of the following?

- a. Limestone
- b. Coke/Coal
- c. Manganese
- d. Scrap metal

Explanation: In traditional steel making (Blast Furnace route), Coke/Coal acts as the reducing agent that removes oxygen from iron ore. Green hydrogen can replace this role, emitting only water vapor instead of CO₂.

National Sports Policy 2025

The new policy supersedes the existing **National Sports Policy, 2001**, and lays out a visionary and strategic roadmap to establish India as a global sporting powerhouse and a strong contender for excellence at international sporting events, including the **2036 Olympic Games**.

The policy is anchored on five key pillars:

This pillar aims to:

- Strengthen sports programs from the grassroots to elite levels, including mechanisms for early identification and nurturing of talent.
- Promote the establishment of competitive leagues and competitions, and develop sports infrastructure in both rural and urban areas.
- Build world-class systems for training, coaching, and holistic athlete support.
- Enhance the capacity and governance of National Sports Federations.
- Encourage the adoption of sports science, sports science, medicine, and technology to boost athletic performance.
- Train and develop sports personnel, including coaches, technical officials, and support staff.

Important points where UPSC prelims can confuse you:

1. Encourage private sector participation through Public-Private Partnerships (PPPs), Corporate Social Responsibility (CSR) and innovative funding initiatives.
2. Revitalizing and promoting indigenous and traditional games.
3. Promoting participation among women, economically weaker sections, tribal communities, and persons with disabilities through focused programs.
4. In alignment with the National Education Policy 2020, the NSP 2025 proposes to:
Integrate sports into school curricula.

75th Anniversary of the National Sample Survey (NSS)

National Sample Survey (NSS) was set up by the Government of India in the year 1950, based on the recommendations of **P.C. Mahalanobis** to carry out nation wide sample surveys to collect data on various socio-economic subjects.

It has been carrying out surveys on various subjects such as *Household Consumption Expenditure, Employment & Unemployment, Survey of Industries, Health, Education, Agriculture, Debt & Investment etc.* Its efforts have empowered policymakers, researchers, and the public with reliable and timely data, thereby facilitating evidence-based policymaking and informed public discourse.

NSS headed by a Director General, presently, is a part of the National Statistics Office (NSO) under the Ministry of Statistics and Programme Implementation (MoSPI), Government of India.

The NSS operates through several specialized Divisions and Field Offices:

1. **Field Operations Division (FOD):** Responsible for carrying out fieldwork across the country, supported by a network of Regional and Sub-Regional Offices.
2. **Enterprise and Household Survey Divisions:** These divisions design survey methodologies, process collected data, and prepare analytical reports.
3. **Coordination and Quality Control Division:** Ensures the effective coordination of survey activities and maintains data quality through rigorous oversight
4. **Household Survey Division:** It is responsible for conceptualizing, designing, processing, analyzing and publishing survey result in a comprehensive manner.

National Industrial Classification (NIC) 2025

MoSPI Releases the National Industrial Classification (NIC) – 2025

Posted On: 18 NOV 2025 2:30PM by PIB Delhi

The NIC is a fundamental tool used in statistical surveys, censuses, economic research, and policy formulation.

India's classification system, first introduced in 1962, has been revised periodically in line with international standards and changing economic landscape, leading to NIC 1970, NIC 1987, NIC 1990, NIC 1998, NIC 2004 and NIC 2008. **The NIC 2025 represents the latest updated national standard for classifying economic activities in India.**

The **NIC 2025 has been prepared by MoSPI in alignment with the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 5**, developed by the **United Nations Statistics Division (UNSD)**.

The NIC 2025 introduces a new 6-digit coding structure, in place of the 5-digit structure of NIC 2008. This enhancement allows for greater granularity and flexibility, enabling better representation of emerging activities.

The salient feature of NIC 2025 are:

1. **Enhanced Classification of Intermediation Services:** New classes have been created across multiple sections to reflect the growing role of intermediaries in sectors such as power, retail, logistics, healthcare, education, real estate, and food services.
2. **Environmental and Green Economy Integration:** Expanded coverage of carbon capture, waste management, and environmental remediation activities, with better alignment to SDGs and SEEA framework.
3. **Digital Economy Representation:** Cloud infrastructure, blockchain, platform-based services, and web search portals are distinctly classified, reflecting the evolving nature of the digital economy.
4. **Classification is technology agnostic:** In general, distinction of activities is not made based on whether an activity is carried out by means of traditional or modern production techniques.

Tropical Forests Forever Facility (TFFF)

India welcomed Brazil's initiative to establish the Tropical Forests Forever Facility (TFFF), recognizing it as a significant step towards collective and sustained global action for the preservation of tropical forests, and **joined the Facility as an Observer.**

It was launched during COP30

The TFFF supports countries that already have low deforestation rates by increasing resources for their conservation, sustainable use, and restoration programs and policies.

Day 18, 5 topics daily series, UPSC Prelims 2026, By Abhishek sir

86. Recombinant DNA Technology

87. India AI Impact Summit 2026

88. World Wildlife Day 2026

89. India's First Riverine Lighthouses

90. 5% Model of Chhattisgarh

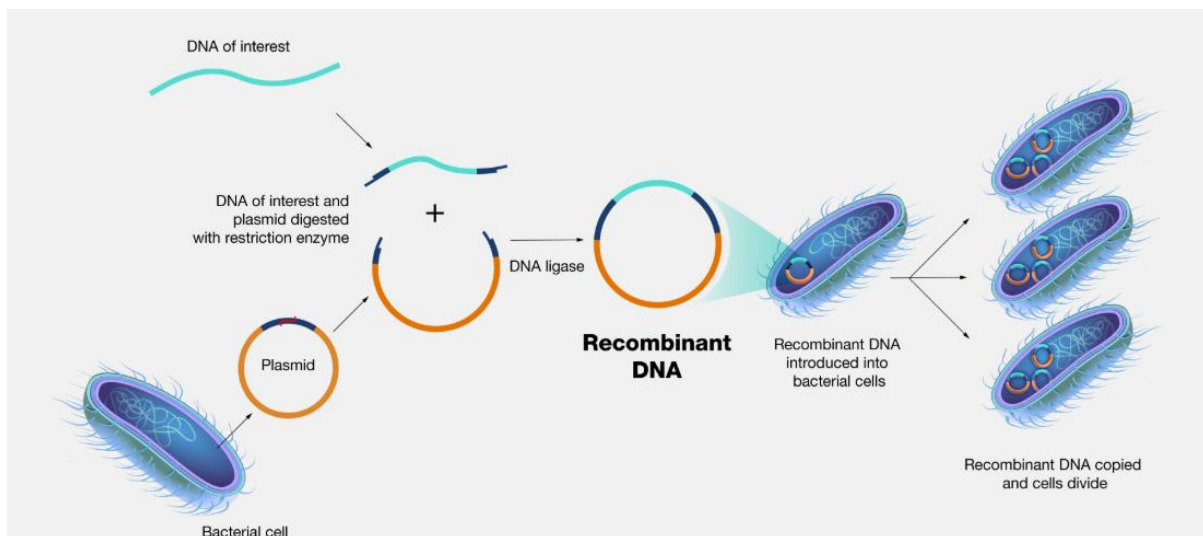
Learn topics and solve few questions.

Recombinant DNA Technology

Indian government inaugurated the new state-of-the-art "Central Facility for Recombinant Cells and Sensors" at BRIC-Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, Kerala.

The new Recombinant Cell facility promises to boost drug discovery as well as medical and Agri genomics.

Recombinant DNA Technology:



Q1. Consider the following statements.

Statement I:

Recombinant DNA technology allows the production of human insulin using bacterial cells.

Statement II:

Bacterial cells can be genetically modified to express foreign genes inserted into them.

Which one of the following is correct?

- 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.

Answer: (a) Both Statement I and Statement II are correct and Statement II explains Statement I

Statement I is correct → Human insulin is produced using genetically modified E. coli.

Statement II is correct → This is the core principle of recombinant DNA technology.

II explains I → Because insulin production is possible only due to gene insertion + expression.

Q2. Consider the following statements.

Statement I:

Recombinant DNA technology is widely used in vaccine development.

Statement II:

It enables the insertion of genes coding for antigens into suitable host organisms for large-scale production.

Answer: (a) Both Statement I and Statement II are correct and Statement II explains Statement I

Statement I → Correct (Hepatitis B vaccine, etc.)

Statement II → Correct → describes how vaccines are produced

II explains I → antigen-producing genes inserted → mass production.

India AI Impact Summit 2026

Q1. With reference to the India AI Impact Summit 2026, how many of following declarations and partnerships were announced?

1. New Delhi Declaration on AI Impact
2. Charter for the Democratic Diffusion of AI
3. Alliance for Advancing Inclusion Through AI
4. Global AI Impact Commons

Answer is all the above.

Solution from Summit final paper:

Landmark Global Declaration and Major AI Investment Commitments:

1. The **India AI Impact Summit Declaration was endorsed by 92 countries** and international organizations. The Declaration acknowledges the work undertaken by seven thematic working groups during the Summit.

2. The **New Delhi Frontier AI Impact Commitments** were announced by 13 leading global and Indian frontier model developers to promote trustworthy and inclusive AI deployment.
3. **Launch of the Global AI Impact Commons**, a voluntary initiative featuring 80+ impact stories across 30+ countries, enabling nations to share, replicate, and scale successful AI use cases for economic growth and social good.
4. Release of the **Equitable AI Transition Playbook in partnership with the International Labour Organization**, aimed at preparing workers for emerging AI-driven opportunities.
5. Signing of the **Voluntary Guiding Principles for Resilient, Innovative and Efficient AI**, endorsed by over 20+ countries.
6. Signing of the **Voluntary Guiding Principles for Reskilling in the Age of AI**, endorsed by 23 countries.
7. **Adoption of the Charter for the Democratic Diffusion of AI**, supported by 22 countries and international institutions.
8. Launch of the **Resilient AI Challenge in partnership with UNESCO** and France.
9. Release of the Playbook for Advancing Resilient AI Infrastructure.
10. Announcement of the **Trusted AI Commons, with 22 partner countries** prior to formal launch.
11. Release of Guidance Notes on AI Governance, endorsed by 22 countries.
12. **Announcement of the Alliance for Advancing Inclusion Through AI**, endorsed by 20 countries and UNICEF.
13. Launch of the **Network of AI for Science Institutions**, with 19 partner countries at inception.

World Wildlife Day 2026

Q1. World Wildlife Day is observed on 3 March to mark the adoption of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)? Yes.

Q2. The theme for 2026 is “Medicinal and Aromatic Plants: Conserving Health, Heritage and Livelihoods”? Yes

Q3. The **National Medicinal Plants Board (NMPB)** functions under ministry of environment AND Climate Change?

NMPB, Ministry of Ayush recently incorporated a new component “Medicinal Plants Business Centre (MPBC)” under the existing Central Sector Scheme of NMPB with following objectives: -

1. To develop Medicinal Plants Business Centre for effectively managing Medicinal Plants produce
2. To promote innovative and latest technologies in Medicinal Plants post-harvest management and marketing infrastructure.
3. To promote creation of scientific storage capacity for storing farm produce, graded/primaryprocessedfarmproducetoreducepost-harvestandhandlinglosses.
4. To provide infrastructure facilities for washing, sorting, grading, value addition, packaging, storage and quality testing of Medicinal Plants raw material.

Q4. Medicinal Plants Conservation Area initiative (MPCA) is an in-situ or ex-situ conservation?

In situ conservation means protecting plants and animals in their natural habitats. It is carried out through national parks, biosphere reserves and gene sanctuaries.

One important example of such conservation for medicinal plants is the **Medicinal Plants Conservation Area initiative (MPCA)**. MPCA is a designated site aimed at protecting medicinal plant species in their natural habitats. Presently, 115 MPCA sites in India represent models to implement indigenous health traditions along with biological and cultural diversity using in-situ conservation techniques.

Q5. e-CHARAK” mobile application IS FOR?

To provide a platform for trade of Medicinal Plants & to provide easy market access National Medicinal Plants Board (NMPB), Ministry of AYUSH has launched “e-CHARAK” mobile application as well as web portal for the promotion and marketing of medicinal plants/herbs. “e-CHARAK” is a platform to enable information exchange between various stakeholders mainly farmers involved in the medicinal plants sector across the country.

Q6. Consider the following pairs. (GI Tags medicinal plant: belongs to)

1. **Navara Rice: Andhra Pradesh**
2. **Green Cardamom; Kerala**
3. **Saffron: Jammu and Kashmir**

How many are correct?

First is incorrect:

Navara Rice (*Oryza sativa* L.) is grown mainly in **Palakkad and nearby districts of Kerala**. It is called Shashtikashali in Ayurveda. It is an important part of the Panchakarma treatment known as Navarakizhi. It helps in treating rheumatic pain. It is useful for polio-related disabilities. It improves blood circulation problems. It also helps in respiratory diseases.

India’s First Riverine Lighthouses

Q1. India’s First Riverine Lighthouses to Come Up on which river?

Indian government laid the foundation stones for four river lighthouses along the banks of the **Brahmaputra River**, marking the first-time lighthouse infrastructure will be established on an inland waterway in the country.

- a. The combined project outlay for all four lighthouses stands at approximately ₹84 crore.
- b. Each lighthouse will rise to 20 metres with a geographical range of 14 nautical miles and a luminous range of 8–10 nautical miles, powered entirely by solar energy.
- c. Alongside navigation infrastructure, every site will feature a museum, amphitheatre, cafeteria, children's play area, souvenir shop and landscaped public spaces, positioning each lighthouse as a tourism landmark as well as a functional maritime asset.

Q2. The **establishment of lighthouse infrastructure** on the Brahmaputra River primarily aims to facilitate:

- a. Hydroelectric power generation
- b. Round-the-clock (night) navigation for vessels

- c. Deep-sea fishing initiatives
- d. Coastal erosion monitoring

Explanations:

The primary goal of these river lighthouses is to enable safe navigation during the night and periods of poor visibility, thereby ensuring 24/7 operational capability for National Waterway 2.

Why India is Building Inland Lighthouses?

The transition of lighthouse infrastructure to inland rivers is driven by several strategic objectives:

- a. National Waterway 2 (NW-2) Development: The Brahmaputra is a vital artery for the Northeast. Modernizing it is essential for the "Act East" policy, connecting India to Southeast Asian markets via the Indo-Bangladesh Protocol Route.
- b. Multimodal Connectivity: These structures support the PM Gati Shakti National Master Plan by making water transport a reliable alternative to congested rail and road networks.
- c. Night Navigation: One of the biggest hurdles for inland shipping has been the lack of safe night-time transit. Lighthouses, equipped with modern sensors and lighting, solve this logistical bottleneck.
- d. Tourism and Safety: Beyond cargo, these lighthouses facilitate safer river cruises and ferry services, boosting local tourism and ensuring the safety of daily commuters.

5% Model of Chhattisgarh

News:

Jal Sanchay Jan Bhagidari: How Korea's **5% Model** Turned Water Scarcity into Water Security

The 5% Model: Korea district of Chhattisgarh

Under the Aawa Paani Jhoki movement, **farmers voluntarily set aside 5% of their agricultural land to construct small recharge ponds and terraced pits**. These structures capture rainwater directly within fields, ensuring that every monsoon drop is retained, absorbed, and reused.

The results have been remarkable:

- a. Rainwater that once flowed away now recharges the soil and aquifers
- b. Soil erosion has reduced significantly
- c. Crop moisture levels have improved during dry spells
- d. Groundwater recharge has become steady and sustained

**Day 19, 5 topics daily series, UPSC Prelims 2026,
By Abhishek sir**

91. ASMITA (Achieving Sports Milestone by Inspiring Women Through Action)

92. Major LNG hubs

93. Network Readiness Index Report 2025

94. BIOFACH 2026

95. Inclusion/exclusion of community in SC/ST list.

Lean topics.

ASMITA (Achieving Sports Milestone by Inspiring Women Through Action)

Prime Minister shares an article on **ASMITA initiative** promoting women in sports

Posted On: 08 MAR 2026 4:37PM by PIB Delhi

The Ministry of Youth Affairs and Sports (MYAS), through the Khelo India initiative, is promoting the ASMITA (Achieving Sports Milestone by Inspiring Women Through Action) Leagues. Formerly known as the Khelo India Women's League, ASMITA represents the unyielding spirit, resilience, and power of Indian women athletes.

Just know about the initiative and objective.

Major LNG Hubs

Q1. Consider the following pairs (major gas hubs: location)

1. Ras Laffan: Qatar
2. South Pars: Iraq
3. Kharg island: Iran
4. Ras Tanura: Saudi Arabia

How many of the above pairs is/are correct?

Only one is incorrect. Try to find yourself.

Some more information on LNG:

LNG is created by transforming natural gas into a liquid state, by cooling it to -161°C (-259°F). The process reduces it to 1/600th of its original un-liquified volume and to half the weight of water.

Half of India's natural gas requirement is produced within India and the other half is imported as LNG through ships. Of India's LNG imports, Qatar supplies half, bulk of it through long-term contracts.

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Imported LNG is temporarily stored in tanks near LNG terminals in Indian ports, then regasified for use as natural gas which is then transported through pipelines. These tanks are specially designed with high grade insulation to store the cryogenic liquid. But **India does not have significant LNG storage capacity** unlike say in Europe where they are stored in underground facilities for the sake of energy security.

In India, **natural gas is used to produce ammonia, which is in turn used to produce fertilizers.** Natural gas is also used to produce power; for City Gas Distribution (CGD) for cooking, vehicles and commercial uses; and in refineries, as well as for other industrial uses.

Network Readiness Index Report 2025

This report becomes important because it is published in PIB and the organization which releases it is not a common name. thoda unique h..

India shines in Network Readiness Index Report 2025, prepared by Portulans Institute based in Washington DC

- a. India has improved its position by four slots and is now placed at 45th rank as per the Network Readiness Index 2025 (NRI 2025) report released on 4.2.2026.
- b. The report maps the network-based readiness landscape of 127 economies based on their performance in **four pillars:** Technology, People, Governance and Impact, covering a total of 53 indicators.
- c. The report has been prepared by the **Portulans Institute, an independent,** non-profit research and educational institute based in Washington DC.

India's performance:

India leads in several indicators.

- a. The report states that India secured 1st rank in "Annual investment in telecommunication services", "AI scientific publications", "ICT services exports" and "E-commerce legislation",
- b. 2nd rank in "FTTH/Building Internet subscriptions", "Mobile broadband internet traffic within the country" and "International Internet bandwidth", and
- c. 3rd rank in "Domestic market scale" and "Income Inequality".

NRI 2025 report states that India has greater network readiness than would be expected given its income level. **India is ranked 2nd in the group of lower-middle-income countries.**

The United States topped the Network Readiness Index (NRI) 2025 report for the fourth consecutive year, retaining its position as the global leader in leveraging digital technologies.

BIOFACH 2026

India has been designated as the Country of the Year at BIOFACH 2026, the world's leading trade fair for organic products, scheduled to be held from 10th to 13th February 2026 at **Nuremberg, Germany.**

BIOFACH Germany is the world's largest and most influential exhibition dedicated exclusively to organic food and agriculture.

After a span of 14 years, India's organic farming sector is set to take centre stage once again at BIOFACH 2026.

Biofach India 2012 WAS held in Bangalore.

Inclusion/exclusion of community in SC/ST list.

Read below explanation well. Its important you know well how it is done. Very important topic.

Explained | The process of inclusion or exclusion from the Scheduled Tribes list

TTI Premium

Which are the new tribal groups on the list? How are they selected? What is the process?

How is a community added or removed from SC, ST lists?

The process begins at the level of a State or Union Territory, with the concerned government or administration seeking the addition or exclusion of a particular community from the SC or ST list. The final decision rests with the President's office issuing a notification specifying the changes under powers vested in it from Articles 341 and 342. The inclusion or exclusion of any community in the Scheduled Tribes or Scheduled Castes list come into effect only after the President assents to a Bill that amends the Constitution (Scheduled Castes) Order, 1950 and the Constitution (Scheduled Tribes) Order, 1950, as is appropriate, after it is passed by both the Lok Sabha and Rajya Sabha.

A State government may choose to recommend certain communities for addition or subtraction from the list of SCs/STs based on its discretion. This recommendation may come from studies it commissions like in the case of classifying the Hatti community in Himachal Pradesh. Following this, the proposal to include or remove any community from the Scheduled List is sent to the Union Ministry of Tribal Affairs from the concerned State government. After this, the Ministry of Tribal Affairs, through its own deliberations, examines the proposal, and sends it to the Registrar General of India (RGI). Once approved by the RGI, the proposal is sent to the National Commission for Scheduled Castes or National Commission for Scheduled Tribes, following which the proposal is sent back to the Union government, which after inter-ministerial deliberations, introduces it in the Cabinet for final approval.

What is the criteria to begin the process?

To establish whether a community is a Scheduled Tribe, the government looks at several criteria, including its ethnological traits, traditional characteristics, distinctive culture, geographical isolation and backwardness. However, in March this year the Supreme Court said it wanted to fix fool-proof parameters to determine if a person belongs to a Scheduled Tribe and is entitled to the benefits due to the community. It said the judiciary was no longer sure about an “affinity test” used to sift through distinct traits to link a person to a tribe. There is the likelihood, it said, that contact with other cultures, migration and modernisation would have erased the traditional characteristics of a tribe. An apex court Bench of Justices Hemant Gupta and V. Ramasubramanian referred the question of fixing the parameters to a larger Bench, pointing out that the issue was a “matter of importance” when it came to issuing caste certificates.

How many Scheduled Tribes are there officially?

According to the Scheduled Tribes in India as revealed in Census 2011, there are said to be 705 ethnic groups listed as Scheduled Tribes under Article 342. Over 10 crore Indians are notified as STs, of which 1.04 crore live in urban areas. The STs constitute 8.6% of the population and 11.3% of the rural population.

Day 20, 5 topics daily series, UPSC Prelims 2026, By Abhishek sir

96. Ospreys

97. Guillotine

98. Ol Chiki Script

99. Parliamentary Committee on Official Language

100. SWAYATT – Startups, Women and Youth Advantage through e-Transactions

Learn topics now.

Ospreys

With reference to the induction of **MH-60R helicopters in the Indian Navy**, consider the following statements:

1. INAS 335 is the first squadron of MH-60R helicopters commissioned by the Indian Navy?
NAS 335 is the **second** MH-60R squadron, not the first.
2. INAS 335, also known as “Ospreys”, was commissioned at INS Hansa in Goa? Yes.

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3. MH-60R helicopters are primarily designed for anti-submarine and anti-surface warfare roles? Yes.

The Indian Navy commissioned its **second MH 60R helicopter squadron, INAS 335 (Ospreys)** on **17 Dec 2025** at **INS Hansa, Goa**.

The MH-60R is an all-weather, day-and-night capable helicopter designed for Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW), Search and Rescue (SAR), Medical Evacuation (MEDEVAC) and Vertical Replenishment (VERTREP). The induction of INAS 335 will significantly augment the Navy's integral aviation capabilities on the western seaboard.

Guillotine

Q1. In which stage of the Budget process is Guillotine applied?

- a. General Discussion
- b. Voting on Demands for Grants
- c. Passing of Finance Bill
- d. Budget Presentation

Q2. It is applied only in the Lok Sabha?

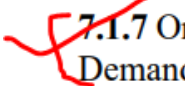

Q3. It involves putting all outstanding Demands for Grants to vote at once without discussion?

Q4. Once the Guillotine is applied, members can still propose "Cut Motions" on the undiscussed demands?

Q5. Since no discussion takes place after the application of Guillotine, the presence of the concerned Minister is not required in the House?

Find answers on your own. Its POLITY.

Hint:

 **7.1.7** On the last day of the days allotted for discussion on the Demands for Grants, at the time fixed in advance, the Speaker, shall put all the outstanding Demands for Grants to the Vote of the House. This process is known as Guillotine. The Presiding Officer calls for vote for the remaining demands one after the other and thus all the demands are voted upon within the allotted time. Ministers concerned with the departments whose Demands for Grants have not been discussed in the Lok Sabha and are to be guillotined should be present in the House at the time of guillotine so that they may answer any points which may be raised by members. 

Guillotining of demands
LSR 208(2)
PRO 9.2

Ol Chiki Script

The Ministry of Culture is organising the inaugural function of the centenary celebrations of the Ol Chiki script on 16 February 2026 in New Delhi.

- (a) A commemorative coin and commemorative postage stamp are being released by the Government of India to mark **100 years of the Ol Chiki script**.
- (b) Ol Chiki script was developed in **1925 by Pandit Raghunath Murmu** specifically for the **Santhali language**, which was later included in the Constitution of India's Eighth Schedule in 2003.
- (c) The script consists of **30 letters designed to accurately represent Santhali phonetics**.
- (d) A defining moment in the journey of the Ol Chiki script came in 2003, when the **Santhali language was formally included in the Eighth Schedule of the Constitution** of India through the 92nd Constitutional Amendment Act.

Parliamentary Committee on Official Language.

Union Home Minister and Minister of Cooperation Shri Amit Shah, along with members of the Parliamentary Official Language Committee, calls on the Hon'ble President today and presents the Committee's 13th report

Just read following paragraph:

The Parliamentary Committee on Official Language was constituted under the provisions of **Section 4 of the Official Languages Act, 1963, in the year 1976.**

The committee comprises **30 members of Parliament, out of which 20 are from the Lok Sabha and 10 from the Rajya Sabha.**

Section 4 of the Official Languages Act, 1963, mandates the constitution of a Committee on Official Language **after ten years from the enforcement of Section 3** (section 3 provides for the continued use of English for official purposes of the Union, even after 1965.)

It shall be the **duty of the Committee to review the progress made in the use of Hindi for the official purposes of the Union and submit a report to the President making recommendations** therein and the President shall cause the report to be laid before each House of Parliament, and sent to all the State Governments.

The President may, after consideration of the report and the views, if any, expressed by the State Government thereon, **issue directions in accordance with the whole or any part of that report.**

SWAYATT – Startups, Women and Youth Advantage through e-Transactions

(a) The initiative to promote “Start-ups, Women and Youth Advantage Through e-Transactions” (SWAYATT) on GeM was first launched in February 2019. The objectives of SWAYATT are to promote inclusiveness of various categories of sellers and service providers on the GeM portal by taking proactive steps for facilitating their training and registrations for specific category of manufacturers and sellers, develop women entrepreneurship and encourage participation of MSME sector and Start-ups in public procurement.

Rooted in GeM’s foundational pillar of social inclusion, SWAYATT focuses on addressing three critical challenges often faced by emerging enterprises:

1. Access to markets
2. Access to finance
3. Access to value addition.

By leveraging the digital procurement infrastructure of GeM, the initiative enables enterprises from across the country to connect directly with government buyers, thereby reducing barriers to entry and expanding opportunities.

The objectives of SWAYATT are to:

1. Promote inclusiveness of various categories of sellers and service providers on the GeM portal by taking proactive steps for facilitating their training and registrations for specific category of manufacturers and sellers.
2. Develop women entrepreneurship.
3. Encourage participation of MSME sector and start-ups in public procurement.