Career Launcher UPSC CSAT

MANTHAN

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1. Maratha Military Landscapes of India Inscribed in the UNESCO World Heritage List as India's 44th Entry

- In a remarkable decision taken at the 47th Session of the World Heritage Committee, India's official nomination for 2024-25 cycle, 'Maratha Military Landscapes of India' got inscribed on the UNESCO World Heritage List, becoming India's 44th property to receive this recognition.
- This global accolade celebrates India's enduring cultural legacy, showcasing its diverse traditions of architectural brilliance, regional identity, and historical continuity.

Maratha Military Landscapes of India

- Spanning from the 17th to 19th centuries CE, this extraordinary network of twelve forts demonstrates the strategic military vision and architectural ingenuity of the Maratha Empire.
- The proposal was sent to the consideration of World Heritage Committee in Jan 2024 and after a rigorous eighteen-month long process involving several technical meetings with the advisory bodies and visit of ICOMOS's mission to review the sites, this historic decision was taken by the members of the World Heritage Committee at UNESCO Headquarters, Paris.
- Spread across the states of Maharashtra and Tamil Nadu, the selected sites, include Salher, Shivneri, Lohgad, Khanderi, Raigad, Rajgad, Pratapgad, Suvarnadurg, Panhala, Vijaydurg, and Sindhudurg in Maharashtra, along with Gingee Fort in Tamil Nadu.

- While Shivneri fort, Lohgad, Raigad, Suvarnadurg, Panhala fort, Vijaydurg, Sindhudurg and Gingee fort are protected under the Archaeological Survey of India whereas Salher fort, Rajgad, Khanderi fort and Pratapgarh are protected by the Directorate of Archaeology and Museums, Government of Maharashtra.
- Located across a range of diverse terrains—from coastal outposts to hilltop strongholds - these forts reflect a sophisticated understanding of geography and strategic defence planning.
- Together, they form a cohesive military landscape that highlights the innovation and regional adaptation of fortification traditions in India.

- Salher, Shivneri, Lohgad, Raigad, Rajgad, and Gingee are situated in hilly terrains and are therefore known as hill forts.
- Pratapgad, nestled within dense woods, is classified as a hill-forest fort. Panhala, located on a plateaued hill, is a hill-plateau fort.
- Vijaydurg, positioned along the shoreline, is a notable coastal fort, while Khanderi, Suvarnadurg, and Sindhudurg, surrounded by the sea, are recognized as island forts.
- The inscription took place during 47th session of the World Heritage Committee in Paris, France, marking a significant milestone in the global acknowledgment of India's rich and diverse cultural heritage.
- During the Committee Meeting, 18 out of the 20 State Parties supported India's proposal to get this important site inscribed in the list.
- The discussion on the proposal went on for 59 mins and after the positive recommendations by 18 State Parties, all the member states, UNESCO, World Heritage Centre, and Advisory Bodies of the UNESCO (ICOMOS, IUCN IUCN) congratulated the delegation of India for this momentous opportunity.
- The Maratha Military Landscape of India was nominated under criteria (iv) and (vi), recognizing their exceptional testimony to a living cultural tradition, their architectural and technological significance, and their deep associations with historic events and traditions.

- The purpose of including these heritage sites in UNESCO's list is to preserve and promote shared heritage based on OUVs (Outstanding Universal Values) found in cultural, natural as well as mixed properties across 196 countries. On its part, India became a member of the World Heritage Committee from 2021-25.
- This global recognition is a testimony to New India's relentless pursuit of highlighting Bharat's heritage on the world forum. This recognition underscores the efforts of the Archaeological Survey of India (ASI) and the Maharashtra government in preserving these historic treasures.
- Last year, the Moidams of Charaideo, Assam were inscribed in the World Heritage List at the 46th Session of the World Heritage Committee held in New Delhi.

- India ranks 6th globally and 2nd in Asia Pacific Region for the most number of World Heritage Sites. 196 nations have ratified the World Heritage Convention, 1972.
- India also has 62 sites in the Tentative List of the World Heritage, which is a mandatory threshold for any site to be considered as a World Heritage property in future.
- Every year, each State Party may propose just one site for consideration of the World Heritage Committee for inscription to the World Heritage List.

India at UNESCO

India currently boasts 44 UNESCO World Heritage Sites, making it the country with the 6th highest number globally, encompassing 36 cultural, 7 natural, and 1 mixed sites.

Cultural Heritage Highlights:

Taj Mahal, Agra (1983)

- White-marble Mughal mausoleum built by Shah Jahan (1632–48), widely regarded as a masterpiece of Muslim art

Agra Fort (1983)

- 16th-century Mughal stronghold housing Jahangir and Khas Mahal palaces

Ajanta & Ellora Caves (1983)

- **Ajanta:** 30+ Buddhist rock-cut caves (2nd century BCE–650 CE).
- **Ellora:** 34 cave temples (Hindu, Buddhist, Jain) featuring the monolithic Kailash Temple

Group of Monuments at Hampi (1986)

- Ruins of the Vijayanagara Empire, including Virupaksha Temple and elaborate bazaars

Khajuraho Group of Monuments (1986)

- Temples noted for Nagara-style architecture and erotic sculptures, built under the Chandela dynasty

Fatehpur Sikri (1986)

- Mughal red sandstone city founded by Akbar, blending Islamic and Hindu influences

Red Fort & Humayun's Tomb (Delhi, 1993 & 2007)

- Exemplars of Mughal architecture; Humayun's Tomb is a precursor to the Taj

Hill Forts of Rajasthan (2013)

- Six Rajput forts (Amer, Chittorgarh, Jaisalmer, Kumbhalgarh, Ranthambore, Gagron), symbolizing military architecture
- Additional Sites include Sanchi, Elephanta, Konark Sun Temple, Mahabalipuram, Chola Temples (Brihadisvara), Churches & Convents of Goa, Rock Shelters of Bhimbetka, etc.

Recent Inscriptions (2023–24):

- Jaipur City, Sacred Ensembles of the Hoysalas (Belur, Halebidu, Somanathapura), Moidams (Ahom burial chambers)

Latest Addition (2025):

- Maratha Military Landscapes: 12 forts across Maharashtra and Tamil Nadu, including Raigad and Gingee, highlighting Maratha military ingenuity

Natural & Mixed Heritage

- Kaziranga & Manas National Parks (Assam) – famed for one-horned rhinoceros and rich biodiversity.
- Keoladeo National Park (Rajasthan) – renowned bird sanctuary.
- Sundarbans, Western Ghats, Nanda Devi & Valley of Flowers, Great Himalayan NP, Khangchendzonga NP – key ecological refuges

Why They Matter

- Represent outstanding universal value and showcase architectural brilliance, religious artistry, and ecological significance.
- UNESCO listings help in preservation, boosting tourism, and sustaining local economies

Suggestions for Further Exploration

- **Newly Listed Maratha Forts:** Raigad (Shivaji's capital), Panhala (urban planning), Vijaydurg (naval defense), Gingee (fort in Tamil Nadu)
- **Sacred Ensembles of the Hoysalas:** Renowned for distinctive carvings and Dravidian artistry
- **In Summary:** India's UNESCO sites span a stunning range—from ancient rock art at Bhimbetka to Moghul marvels like the Taj, majestic natural parks, and recently acknowledged Maratha forts. They collectively tell the story of India's rich cultural, historical, and ecological legacy.

New UNESCO Listings in 2025

- A total of 26 new sites were inscribed—21 cultural, 4 natural, and 1 mixed property, spanning all continents.

Selected Cultural & Mixed Sites

- **Cambodian Memorial Sites (Tuol Sleng Genocide Museum – S-21;** Choeung Ek killing fields; M-13 prison) – Cambodia's first nomination of sites linked to recent history
- **Murujuga Cultural Landscape** (Western Australia, aka Burrup Peninsula) – features over a million Aboriginal petroglyphs dating up to 50,000 years
- **The Palaces of King Ludwig II** (Neuschwanstein, Linderhof, Herrenchiemsee, Schachen – Germany) – celebrated as Romantic-era cultural icons
- **Minoan Palatial Centres on Crete** (Knossos, Phaistos, Malia, Zakros, Zominthos, Kydonia) – emblematic of Bronze Age civilization
- Other cultural sites include Megaliths of Carnac (France), Funerary Tradition in Prehistoric Sardinia (Italy), Gola-Tiwai Complex (Sierra Leone), Prehistoric Khorramabad Valley (Iran), Xixia Imperial Tombs (China), Petroglyphs along Bangucheon Stream (South Korea), Sardis and Lydian Tumuli (Türkiye), Colonial Transisthmian Route (Panama), Port Royal (Jamaica), Wixarika Route to Wirikuta (Mexico), and Yen Tu–Vinh Nghiem–Con Son Complex (Vietnam).

Natural & Mixed Sites

- **Peruaçu River Canyon & Cavernas do Peruaçu (Brazil)** – natural landscape with caves and canyon ecosystems
- **Møns Klint Chalk Cliffs (Denmark)** – glaciotectonic coastal cliffs with unique
- **Forest Research Institute Park, Selangor (Malaysia)** – pioneering ecological restoration of tropical forest on former tin-mined land
- Coastal & Marine Ecosystems of the Bijagós Archipelago (Guinea-Bissau) – important for biodiversity in West African marine habitats
- **Diy-Gid-Biy Cultural Landscape (Cameroon)** – cultural/natural serial landscape in the Mandara Mountains
- Cultural Heritage Sites of Ancient Khuttal (Tajikistan) – important archaeological and historical remnants

QUESTIONS

1. With reference to the Maratha Military Landscapes of India, consider the following statements:

1. All forts inscribed under this landscape are located in Maharashtra.
2. These forts span different terrain types such as hill forts, coastal forts, and island forts.
3. Gingee Fort is the only fort outside Maharashtra included in the UNESCO inscription.

How many of the above statements given above is/are correct?

A. Only one statement

B. Only two statements

C. All three statements

D. None of the above

2. Which of the following pairs is/are correctly matched regarding the type of fort and location in the Maratha Military Landscapes?

	Type of Fort	**: Fort Name**
1.	Hill-Forest Fort	: Pratapgad
2.	Coastal Fort	: Sindhudurg

3. Hill-Plateau Fort : Panhala
4. Island Fort : Lohgad

Select the correct answer using the codes given below:

A. 1 and 3 only

B. 1, 2 and 3 only

C. 2 and 4 only

D. 1, 2, 3 and 4

3. Consider the following statements regarding India's presence in the UNESCO World Heritage framework:

1. India currently has 44 UNESCO World Heritage Sites.
2. The Moidams of Charaideo were inscribed during the 47th session held in Paris.
3. India can propose a maximum of two sites for inscription each year.
4. India has been a member of the World Heritage Committee from 2021 to 2025.

Which of the statements given above are correct?

A. 1 and 4 only

B. 1, 2 and 4 only

C. 2 and 3 only

D. 1, 2, 3 and 4

4. The Maratha Military Landscapes of India were inscribed in the UNESCO World Heritage List under which of the following categories?

A. Cultural landscape

B. Natural heritage

C. Mixed heritage

D. Intangible cultural heritage

5. Consider the following properties included in the World Heritage List released by UNESCO:

1. Shantiniketan
2. Rani-ki-Vav
3. Sacred Ensembles of the Hoysalas
4. Mahabodhi Temple Complex at Bodhgaya

How many of the above properties were included in 2023?

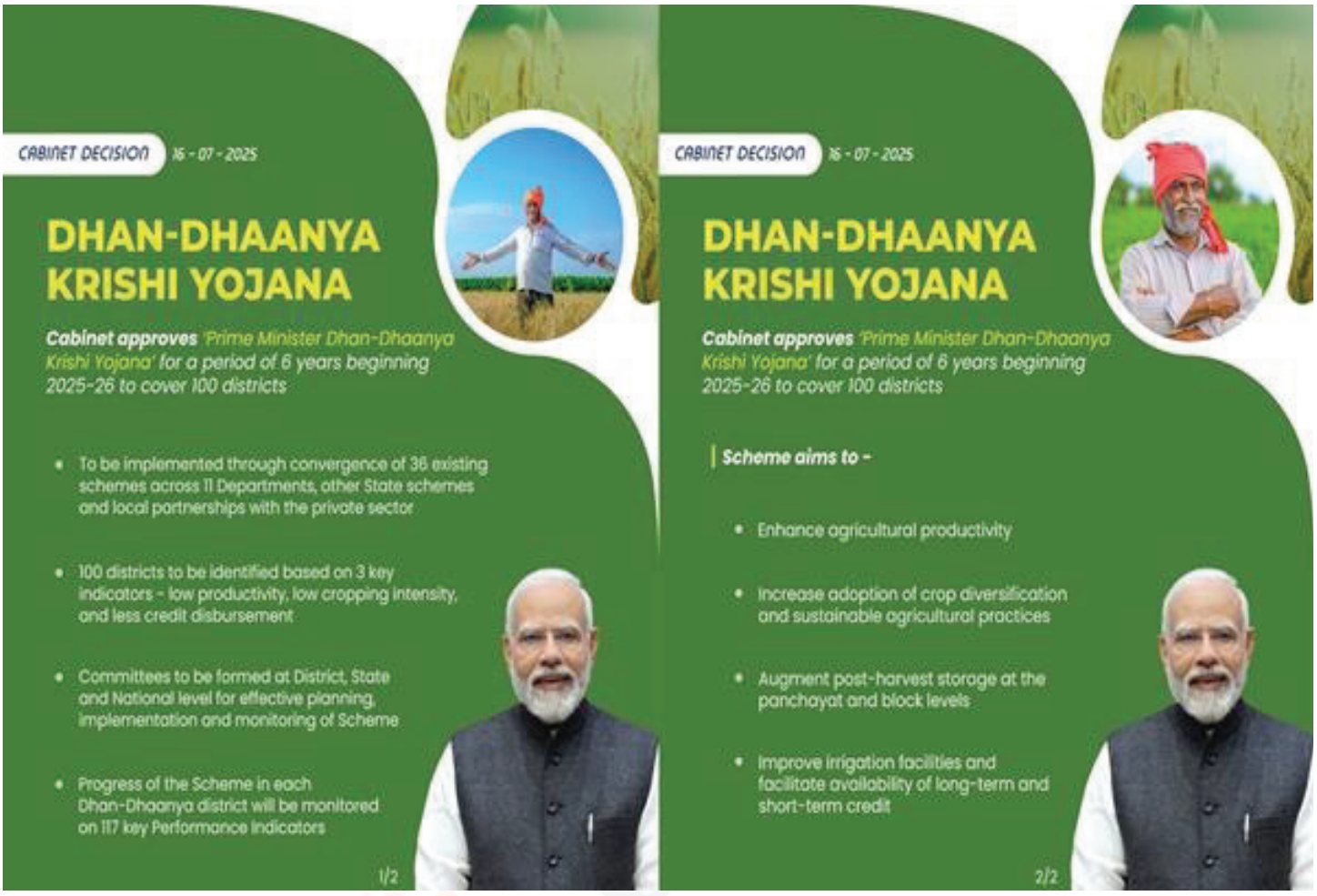
A. Only one

B. Only two

C. Only three

D. All four

2. Cabinet approves the Prime Minister Dhan-Dhaanya Krishi Yojana



- The Union Cabinet chaired by the Prime Minister Shri Narendra Modi approved the "Prime Minister Dhan-Dhaanya Krishi Yojana" for a period of six years, beginning with 2025-26 to cover 100 districts.
- Prime Minister Dhan-Dhaanya Krishi Yojana draws inspiration from NITI Aayog's Aspirational District Programme and first of its kind focusing exclusively on agriculture and allied sectors.
- The Scheme aims to enhance agricultural productivity, increase adoption of crop diversification and sustainable agricultural practices, augment post-harvest storage at the panchayat and block levels, improve irrigation facilities and facilitate availability of long-term and short-term credit.
- It is in pursuance of Budget announcement for 2025-26 to develop 100 districts under "Prime Minister Dhan-Dhaanya Krishi Yojana".
- The Scheme will be implemented through convergence of 36 existing schemes across 11 Departments, other State schemes and local partnerships with the private sector.
- 100 districts will be identified based on three key indicators of low productivity, low cropping intensity, and less credit disbursement.
- The number of districts in each state/UT will be based on the share of Net Cropped Area and operational holdings. However, a minimum of 1 district will be selected from each state.

- Committees will be formed at District, State and National level for effective planning, implementation and monitoring of the Scheme.
- A District Agriculture and Allied Activities Plan will be finalized by the District Dhan Dhaanya Samiti, which will also have progressive farmers as members.
- The District Plans will be aligned to the national goals of crop diversification, conservation of water and soil health, self-sufficiency in agriculture and allied sectors as well as expansion of natural and organic farming.
- Progress of the Scheme in each Dhan-Dhaanya district will be monitored on 117 key Performance Indicators through a dashboard on monthly basis. NITI will also review and guide the district plans.
- Besides Central Nodal Officers appointed for each district will also review the scheme on a regular basis.
- As the targeted outcomes in these 100 districts will improve, the overall average against key performance indicators will rise for the country.
- The scheme will result in higher productivity, value addition in agriculture and allied sector, local livelihood creation and hence increase domestic production and achieving self-reliance (Atmanirbhar Bharat).
- As the indicators of these 100 districts improve, the national indicators will automatically show an upward trajectory.

Major agricultural schemes launched by the Indian government since 2020

1. Formation & Promotion of 10,000 FPOs (launched 29 Feb 2020)

- Central Sector Scheme with ₹6,865 crore outlay (2020–27).
- Provides up to ₹18 lakh support per FPO and equity grants per farmer; credit guarantee up to ₹2 crore eligible per FPO.
- As of Feb 2025, ₹254.4 crore granted to 4,761 FPOs, credit cover for 1,900 FPOs; 10,000th FPO registered in Khagaria, Bihar

2. Agriculture Infrastructure Fund (AIF) (July 2020)

- Rs 1 lakh crore corpus to support farm/infrastructure and logistics.
- Provides credit-linked subsidy across farmer groups, startups, FPOs.
- Punjab's allocation increased from ₹4,713 to ₹7,050 crore by Feb 2025

3. National Beekeeping & Honey Mission (NBHM) (2020)

- Centrally sponsored; initial outlay ₹500 crore (2020‑23), extended through 2025–26 with ₹370 crore
- Trains beekeepers, provides equipment—honey output rose ~12 kt (2019‑20) to ~20 kt (2022‑23)

4. PM-KUSUM Scheme (2020 scope expanded)

- Solarizes agricultural pumps: standalone, grid-connected ground projects, and solarizing existing pumps.
- Aims for 30.8 GW capacity by Dec 2022; up to 60 % subsidy

5. Animal Husbandry Infrastructure Development Fund (AHIDF) (2020)

- ₹15,000 Cr fund to boost private investment in dairy, feed plants, etc.
- Part of broader COVID‑19 stimulus to support the livestock sector

Schemes in 2021–2023

6. National Mission on Edible Oils – Oil Palm (NMEO‑OP) (2021)

- Encourages oil palm cultivation and mills; aims to boost edible oil self-reliance

7. National Mission on Natural Farming (NMNF) (2021)

- Promotes chemical-free farming methods; targets 50 % increase in natural farming area by 2025

8. Integrated Scheme for Agricultural Marketing (AMI sub-scheme under ISAM)

- Extended up to March 2026 with credit-linked subsidy (25–33 %) for storage/cold chain projects.

9. Operation Greens – Phase II (2024)

- Supports tomato, onion, potato growers via price stabilization and reducing post-harvest losses.

10. New Centres for Farm Equipment Hiring (State-level, e.g., Bihar 2025)

- Custom Hiring Centres (CHCs) in panchayats offer mechanization access; significant subsidy for farm machinery.

2025 Major Launches & Campaigns

11. PM Dhan-Dhaanya Krishi Yojana (PMDDKY) (approved July 16, 2025)

- 6-year flagship mission with ₹24,000 Cr annual outlay.
- Focuses on 100 districts, merging 36 schemes under 11 ministries to boost productivity and incomes

12. Viksit Krishi Sankalp Abhiyan (VKSA) (May–Jun 2025)

- 15-day national campaign; 2,000 scientists to train ~1.5 crore farmers in 700 districts on modern farming techniques

13. Akola Cotton High-Density Planting Model (2025 expansion)

- Nationwide adoption to increase productivity and reduce imports; includes AI-based pest control, mechanization

Budget & Policy Signals

- Budget 2025–26: ~₹1.75 trillion (~US$20 bn) allocated for farm sector (+15 %) focusing on pulses, oilseeds, dairy, storage, crop insurance and fisheries (~US$9 bn).

Indian Union Budget 2025–26 for Agriculture

Budget Allocation

- **Total allocation:** ₹1.37 lakh crore (~2.7% of Union Budget), down ~2.5% from RE 2024–25
- **Allocation distribution:**
  - **Dept. of Agri & Farmers' Welfare:** ~92%
  - **77% of this focuses on three schemes:**
    - **PM-Kisan Samman Nidhi (₹6,000/year to all farmer families):** ₹63,500 cr (flat)
    - **Modified Interest Subvention Scheme:** ₹22,600 cr.
    - **Crop Insurance Scheme:** ₹12,242 cr (↓23%).
- **Other schemes (RKVY, Krishionnati, PM-AASHA) also saw funding boosts.**

Major New & Continued Schemes

1. Crop Missions & Value-chain Boosters

- **Mission for Self-Reliance in Pulses:** 6-year mission focusing on tur, urad, masoor
- **Mission for Cotton Productivity:** 5-year drive for extra-long staple cotton
- **National Mission on High-Yielding Seeds:** Promoting >100 improved seed varieties
- **Makhana Board (Bihar):** Value-addition & marketing support

2. Infrastructure & Mechanisation

- **Agriculture Infrastructure Fund:** Continues supporting cold storage, processing (e.g., ₹100k cr launched 2020)
- **Custom Hiring Centres (CHCs):** E.g., Bihar adding 267 centres for mechanisation

3. Revised Dairy & Livestock Schemes:

- NPDD (Dairy) +₹1,000 cr → ₹2,790 cr total
- Rashtriya Gokul Mission +₹1,000 cr → ₹3,400 cr

4. Credit & Insurance Enhancements

- **Kisan Credit Card:** Loan limits increased to ₹5 lakh; add 7.7 cr KCCs including fishermen, dairy
- **Pradhan Mantri Fasal Bima Yojana (PMFBY):** Continues to provide insurance for a wide range of crops

5. Clean Energy Irrigation

- **PM-KUSUM:** Solar irrigation pumps; 60% subsidy, targeting ~3.5 million farmers, upto 30.8 GW solar capacity.
- **Policy Vision & Highlights**
  - **↑15%+ budget growth:** Agriculture budget increased to ₹1.75 trn (~$20 bn), marking biggest boost in six years
  - **Convergence-based approach:** PM-Dhan Dhaanya integrates 36 schemes across 11 ministries
  - **Sustainability & value-chain focus:** Emphasis on pulses, oilseeds, horticulture, dairy, renewable irrigation, and storage infra.

QUESTIONS

6. Which of the following statements regarding the Prime Minister Dhan-Dhaanya Krishi Yojana is/are correct?

1. It will be implemented for a period of five years starting from 2025–26.
2. It draws inspiration from the Aspirational Districts Programme.
3. Only Centrally Sponsored Schemes will be converged under this Yojana.

How many of the above statements given above is/are correct?

A. Only one statement
B. Only two statements
C. All three statements
D. None of the above

7. What are the key indicators used to identify the 100 districts under the Prime Minister Dhan-Dhaanya Krishi Yojana?

A. Low per capita income, high rainfall, and low literacy
B. Low productivity, low cropping intensity, and less credit disbursement
C. High soil salinity, poor irrigation, and low mechanisation
D. High farmer suicide rate, fragmented holdings, and low market access

8. With reference to agricultural initiatives launched since 2020, consider the following pairs:

	Scheme	Objective
1.	PM-KUSUM	: Promote solar energy use in agriculture
2.	National Beekeeping Mission	: Improve pulse productivity
3.	AIF	: Support post-harvest infrastructure

Which of the above pairs is/are correctly matched?

A. 1 and 2 only

B. 1 and 3 only

C. 2 and 3 only

D. 1, 2 and 3

9. Which of the following statements correctly describe the features of the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) Scheme?

1. The scheme is fully funded by both Central and State Governments.
2. It provides Rs. 6,000 annually in three equal installments to eligible landholding farmers.
3. Minor children are included in the definition of a "family" under this scheme.
4. The implementing agency for the scheme is NITI Aayog.

Select the correct answer using the code below:

A. 1 and 2 only

B. 2 and 3 only

C. 3 and 4 only

D. 1, 2 and 4 only

10. Under the Kisan credit card scheme, short-term credit support is given to farmers for which of the following purposes?

1. Working capital for maintenance of farm assets
2. Purchase of combine harvesters, tractors and mini trucks
3. Consumption requirements of farm households
4. Post-harvest expenses
5. Construction of family house and setting up of village cold storage facility

Select the correct answer using the code given below:

A. 1, 2 and 5 only

B. 1, 3 and 4 only

C. 2, 3, 4 and 5 only

D. 1, 2, 3, 4 and 5

3. India Rolls Out First-Ever e-Truck Incentive Scheme Under PM Modi's Green Mobility Vision

- Under the visionary leadership of Prime Minister Shri Narendra Modi and the guidance of Union Minister for Heavy Industries & Steel, Shri H.D. Kumaraswamy, the Ministry of Heavy Industries (MHI), Government of India, has launched a groundbreaking scheme to provide financial incentives for electric trucks (e-trucks) under the PM E-DRIVE initiative.
- This mark the first time the Government of India is extending direct support for electric trucks, aiming to accelerate the country's transition to clean, efficient, and sustainable freight mobility.
- Highlighting the significance of the scheme, Union Minister Shri H.D. Kumaraswamy stated, "Diesel trucks, though constituting only 3% of the total vehicle population, contribute to 42% of transport-related greenhouse gas emissions and significantly worsen air pollution.
- This pioneering scheme, guided by the visionary leadership of Prime Minister Shri Narendra Modi, represents India's first dedicated support for electric trucks.
- It will drive our nation toward sustainable freight mobility, a cleaner future, and the realization of Viksit Bharat by 2047, in alignment with our net-zero emissions goal by 2070."
- Under the scheme, demand incentives will be extended to N2 and N3 category electric trucks, as defined under the Central Motor Vehicle Rules (CMVR).
- The N2 category includes trucks with a Gross Vehicle Weight (GVW) above 3.5 tonnes and up to 12 tonnes.

- The N3 category covers trucks with GVW exceeding 12 tonnes and up to 55 tonnes. In the case of articulated vehicles, incentives will apply only to the puller tractor of the N3 category.
- To ensure reliability and performance, the scheme mandates comprehensive manufacturer-backed warranties.
- The battery must be covered under a warranty for five years or 5 lakh kilometres, whichever is earlier.
- The vehicle and motor must have a warranty of five years or 2.5 lakh kilometres, whichever is earlier.
- To promote affordability, the incentive amount will depend on the GVW of the electric truck, with the maximum incentive set at ₹9.6 lakh per vehicle. These incentives will be offered as an upfront reduction in the purchase price and reimbursed to OEMs via the PM E-DRIVE portal on a first-come, first-served basis.
- The scheme is expected to support the deployment of approximately 5,600 e-trucks across the country.
- A dedicated provision for 1,100 e-trucks registered in Delhi has been made, with an estimated outlay of ₹100 crore, aimed at addressing the capital's serious air quality challenges.
- Key sectors set to benefit include the cement industry, ports, steel, and the logistics sector.
- Several leading OEMssuch as Volvo Eicher, Tata Motors, and Ashok Leylandare already engaged in manufacturing electric trucks in India, enhancing indigenous capabilities under the Atmanirbhar Bharat vision.
- The initiative has received a warm response from both manufacturers and users of e-trucks, who acknowledge the scheme's potential to lower logistics costs and reduce carbon emissions.
- As a strong show of CPSE leadership, the Steel Authority of India Limited (SAIL) has committed to procure 150 e-trucks over the next two years for deployment across multiple locations.
- Additionally, SAIL has set an internal target to ensure that at least 15% of all vehicles hired across its units are electric.
- To qualify for the incentives, the scrapping of old, polluting trucks is mandatoryensuring a dual benefit of modernising vehicle fleets and reducing emissions.
- This forward-looking initiative by the Ministry of Heavy Industries aligns with the Government of India's broader objective of building a self-reliant electric mobility ecosystem.
- By extending incentives to e-trucks, the scheme aims to reduce operational costs for transporters, encourage clean energy adoption in the heavy vehicle segment, and enhance air quality in urban and industrial regionsbringing India closer to a sustainable, low-carbon future.

"Green Mobility Vision"

- A "Green Mobility Vision" refers to a strategic and holistic approach to transforming transportation systems to be more sustainable, environmentally friendly, and inclusive.
- It usually involves integrating eco-friendly technologies, policies, and behaviors to reduce carbon emissions, enhance air quality, and create more livable communities.

Green Mobility Vision

Vision Statement:

- To create a sustainable, inclusive, and carbon-neutral mobility ecosystem that enhances quality of life, supports economic growth, and protects the environment for future generations.

Key Pillars of Green Mobility

Electrification of Transport

- Promote electric vehicles (EVs), e-bikes, and electric public transit.

- Expand EV charging infrastructure.
- Support clean energy integration for charging stations.

Public and Shared Transit

- Invest in efficient, affordable, and clean public transport.
- Encourage carpooling, ride-sharing, and microtransit solutions.
- Prioritize last-mile connectivity.

Active Transportation

- Expand walkable and bike-friendly infrastructure.
- Improve safety and accessibility for pedestrians and cyclists.
- Promote health through active mobility.

Smart and Integrated Mobility

- Deploy Mobility-as-a-Service (MaaS) platforms to unify various transport modes.
- Utilize real-time data and AI to optimize routes and reduce congestion.
- Encourage contactless, multimodal trip planning and payments.

Sustainable Urban Planning

- Design compact, transit-oriented developments.
- Minimize dependence on private cars in urban centers.
- Implement green corridors and low-emission zones.

Policy and Incentives

- Introduce incentives for low-emission vehicles and clean fleets.
- Implement congestion pricing and emissions taxes.
- Support R&D in clean transportation technologies.

Benefits of Green Mobility

- **Environmental:** Reduced greenhouse gas emissions, air and noise pollution.
- **Economic:** Job creation in clean tech and public transit sectors.
- **Social:** Improved health, access to opportunities, and urban equity.
- **Resilience:** Stronger, more adaptable transport systems in the face of climate change.

PM E-DRIVE initiative

- The PM E-DRIVE (Prime Minister Electric Drive Revolution in Innovative Vehicle Enhancement) is India's flagship EV push, launched from October 1, 2024 to March 31, 2026, with a ₹10,900 crore outlay.

Scheme Overview

- **Demand-side incentives across multiple vehicle types** — commercial e-2 wheelers, e-3 wheelers, e-buses, e-ambulances, and e-trucks (categories N2 & N3).
- **Charging infrastructure: Plans include** ~72,300 public chargers — fast chargers for 4-wheelers, plus units for buses, 2- and 3-wheelers.
- **Testing agencies:** ₹780 crore dedicated to modernizing labs and facilities for EV certification and safety.
- **E-voucher system:** Buyery & dealer process via Aadhaar-authenticated vouchers for seamless subsidy claim.

Financial Allocation Breakdown

Total ₹10,900 cr across categories:

Segment	Units Targeted (approx.)	Fund Allocation (₹ crore)
e-2 Wheelers	24.79 lakh	1,772
e-3 Wheelers + carts	2.05 lakh + 1.10 lakh	715 + 192
e-Ambulances	—	500
e-Trucks	~5,643	500
e-Buses	14,028	4,391
Charging Stations	~72,300 units	2,000
Testing Agencies	—	780
Administrative	—	50

Key Highlights & Policy Details

- **E-trucks incentive:** Up to ₹9.6 lakh per vehicle (based on GVW), with upfront price reduction to OEMs; 5-year battery warranty; target ~5,600 e-trucks nationally, including 1,100 in Delhi (₹100 cr earmarked).
- **E-bus rollout:** Allocation of 14,028 e-buses (under ₹10,900 cr) — 4,500 to Bengaluru, 2,800 to Delhi, 2,000 to Hyderabad, plus others for Ahmedabad & Surat.
- **Two-/three-wheeler progress:** Almost halfway toward targets for e-2/3-wheeler subsidies.
- **No direct cash incentives for e-cars** — backed by low 5% GST; subsidy focus remains on commercial and public vehicles.

Strategic Intent

- Curb emissions by electrifying freight, public transport, and last-mile vehicles.
- Support domestic EV industry via local manufacturing, testing upgrades, and technological compliance.
- Promote charging ecosystem to reduce range anxiety and accelerate adoption.

Recent Updates (mid-July 2025)

- **First-ever e-truck incentives were launched on July 11, 2025**: ₹9.6 lakh per unit, ₹500 cr from PM E-DRIVE has been earmarked for e-trucks; SAIL to procure 150 vehicles.
- E-bus deployment continues, with major metros receiving allocated buses; consumer groups highlight design and accessibility enhancements needed before handover.

"Viksit Bharat by 2047" (Developed India by 2047)

- "Viksit Bharat by 2047" (Developed India by 2047) is a vision set forth by the Government of India aiming to transform India into a fully developed nation by the 100th year of its independence.

What Does Viksit Bharat 2047 Envision?

A Viksit Bharat (Developed India) by 2047 envisions a nation that is:

Economically Strong

- Becoming a top 3 global economy
- High GDP per capita
- Robust infrastructure and digital economy

- Self-reliant (Atmanirbhar Bharat)

Socially Inclusive

- No poverty or extreme inequality
- Quality education and healthcare for all
- Gender equality and social justice
- Empowered youth and women

Technologically Advanced

- Leadership in AI, space, green tech
- Innovation-driven ecosystem
- World-class research & development

Environmentally Sustainable

- Net-zero carbon emissions (goal by 2070)
- Clean air, water, and energy
- Focus on sustainable agriculture and urbanization

Governance & Global Leadership

- Transparent and efficient governance
- Strong democratic institutions
- Influential role in global diplomacy and peace

QUESTIONS

11. Which of the following statements about the Green Mobility Vision is/are correct?

1. It aims to reduce greenhouse gas emissions and promote public health.
2. It involves electrification of freight vehicles and urban planning for walkable cities.
3. It seeks to phase out electric vehicles in favor of hybrid fuel models.

Select the correct answer using the code below:

A. 1 only

B. 1 and 2 only

C. 2 and 3 only

D. 1, 2 and 3

12. The PM E-DRIVE (Prime Minister Electric Drive Revolution in Innovative Vehicle Enhancement) is India's flagship EV push, launched from October 1, 2024 to March 31, 2026, with a ₹10,900 crore outlay. Under the PM E-DRIVE scheme launched in 2025, which of the following categories of vehicles are eligible for direct demand incentives?

1. N2 category electric trucks
2. Private electric passenger cars
3. N3 category electric trucks
4. Electric buses
5. Electric ambulances

Select the correct answer using the code below:

A. 1, 2 and 3 only

B. 2, 4 and 5 only

C. 1, 3, 4 and 5 only

D. 1, 2, 3 and 5 only

13. In the context of PM E-DRIVE, which of the following are mandatory for an electric truck to qualify for incentives?

1. 5-year or 5 lakh km battery warranty
2. Vehicle scrapping of old diesel trucks
3. Warranty on motor and vehicle for 5 years or 2.5 lakh km
4. Registration in a Smart City

Select the correct answer using the code below:

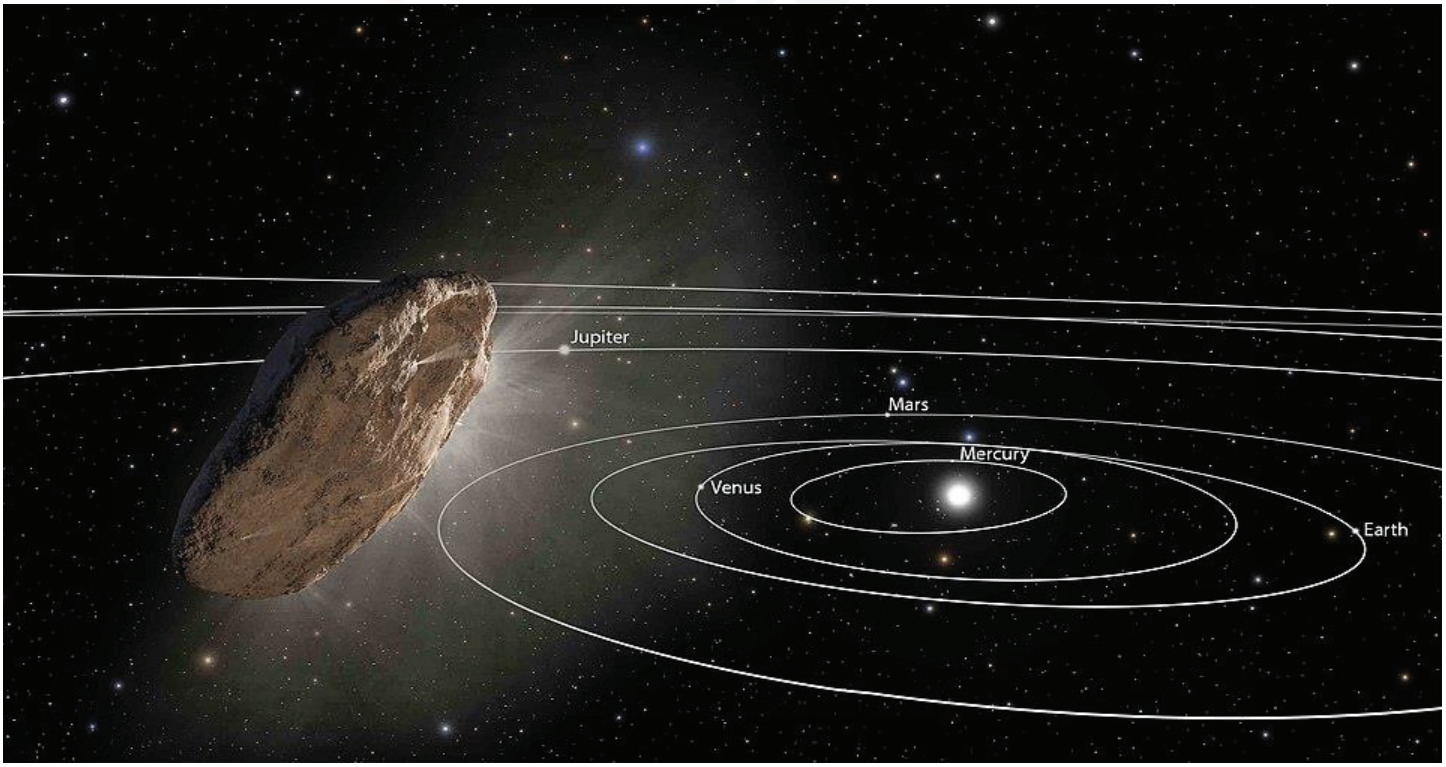
A. 1 and 2 only

B. 1, 2 and 3 only

C. 1 and 3 only

D. 2, 3 and 4 only

4. 3I/Atlas: How do scientists determine if an object is interstellar?



- The mysterious interstellar object, named 3I/Atlas, which was discovered earlier in July could be the oldest comet ever seen.
- The object could be more than seven billion years old — three billion years older than our Solar System.
- The preliminary findings were presented by a team of scientists from Oxford University at the national meeting of the United Kingdom's Royal Astronomical Society in Durham.
- 3I/Atlas was first spotted by the Asteroid Terrestrial-impact Last Alert System (Atlas) survey telescope in Río Hurtado, Chile.
- At the time it was about 670 million km from the Sun. Currently, the object is about the distance of Jupiter from Earth, around 917 million km.
- It is just the third interstellar object that scientists have discovered so far. The first two were 1I/'Oumuamua and 2I/Borisov that were found in 2017 and 2019 respectively.

What are interstellar objects?

- Interstellar objects are celestial bodies that originate outside the solar system, and travel through it.
- These objects are not gravitationally bound to a star.
- They can come from other solar systems and be thrown into interstellar space — the area between the stars — due to collisions or be slingshotted by a planet's or star's gravity.
- Scientists have long suspected that interstellar objects frequently pass through our solar system.
- However, these objects were not discovered until recently as they were too small and faint to be detected. With recent advancements in technology and the development of more powerful telescopes, scientists have now begun to observe them.

How do scientists ascertain if a celestial body is interstellar?

- To determine if a celestial body is interstellar, scientists compute its trajectory.
- All planets, asteroids, and comets within the Solar System move in closed elliptical orbits.
- When they come closest to the Sun (a point called perihelion), they travel the fastest, trying to move away from the Sun, but are slowed down by solar gravitational pull.
- When these celestial bodies are farthest from the Sun (a point called aphelion), they are brought back close to the Sun by solar gravitational pull.
- The trajectory of interstellar objects, however, is quite different.
- They basically move in an open-ended hyperbolic orbit, where there is a perihelion point but no aphelion.
- That is because these objects move at such great speeds that the Sun's gravitational pull is not able to slow them down enough during their outbound leg, allowing them to escape our Solar System.
- Scientists determine the trajectory of these objects by observing several factors, including the speed at which they are moving, and how far away they are compared with other stars in the background.
- If an object is moving fast enough at a faraway distance, it is bound to be following a hyperbolic orbit.
- In the case of 3I/Atlas, scientists observed that it was moving at the speed of 60 kmph at a distance of 670 million km from the Sun.
- This speed is quite fast for such a distance because the further away a celestial body is from the Sun, the slower it moves due to weaker solar gravitational pull.
- This means that 3I/Atlas must have approached our Solar System already with considerable initial speed, and thereby is an interstellar object.

Why is examining interstellar objects significant?

- Objects such as 3I/Atlas and 1I/'Oumuamua can help give clues about the formation of worlds far beyond our Solar System.
- Scientists usually analyse the chemical composition of these objects which can provide them information about the conditions of the objects' solar systems, and how they were formed.
- For instance, if an interstellar object is a comet with a lot of ice, it tells scientists that it was formed far away from a star and then got ejected by something massive, such as a planet the size of Jupiter or Neptune.
- The ice can also reveal where the object came from.

Interstellar object

- An interstellar object is a natural object (like a comet, asteroid, or even potentially a spacecraft) that originates outside our solar system and passes through it.
- These objects are not gravitationally bound to the Sun and are instead on hyperbolic trajectories—meaning they came from another star system or interstellar space and will continue on their way after briefly passing through ours.

Known Interstellar Objects

So far, only two have been confirmed:

1. 'Oumuamua (1I/2017 U1)

- **Discovered:** October 2017 by the Pan-STARRS telescope in Hawaii.
- **Name meaning:** Hawaiian for "scout" or "messenger from afar."
- **Shape:** Extremely elongated—like a cigar or pancake (depending on modeling).
- **Speed:** ~87.7 km/s relative to the Sun.

Oddities:

- No visible comet-like tail, despite acceleration that couldn't be fully explained by gravity alone.
- Some speculated it could be artificial, but most scientists believe it's a natural object with outgassing too subtle to be detected.

2. 2I/Borisov

- **Discovered:** August 2019 by amateur astronomer Gennady Borisov.
- **Nature:** A clear interstellar comet, complete with a coma and tail.
- **Speed:** ~32 km/s relative to the Sun.
- More "normal": Chemically and visually resembled comets from our own solar system, although with some differences in gas composition.

Key Characteristics of Interstellar Objects

- **Hyperbolic orbit (eccentricity > 1):** Indicates they aren't bound to the Sun.
- **High speed:** Too fast to have originated from inside the solar system.
- **Trajectory:** Doesn't trace back to any known solar system body.

Why They Matter

- They may carry clues about the composition of other star systems.
- Help us understand planetary formation and the dynamics of objects being ejected from their home systems.

- Raise possibilities of panspermia (life spreading between stars) or even technosignatures (though this is speculative).

QUESTIONS

14. Which of the following best indicates that a celestial object is of interstellar origin?

A. It follows an elliptical orbit with a perihelion and aphelion.

B. It moves in a retrograde direction compared to planets.

C. It has a hyperbolic trajectory not bound by the Sun's gravity.

D. It appears brighter than other stars at the same distance.

15. Why is the object 3I/Atlas considered interstellar?

A. It is closer to Jupiter than the Sun.

B. It was discovered near the Asteroid Belt.

C. It was formed during the formation of our solar system.

D. It is moving at high speed at a far distance from the Sun.

16. Consider the following statements regarding interstellar objects:

1. All known interstellar objects so far have shown clear cometary features like a coma and tail.
2. They travel in hyperbolic orbits and are not gravitationally bound to the Sun.
3. Interstellar objects can reveal clues about the planetary systems they originated from.

Which of the statements given above is/are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

5. State of inequality in India

- A recent report by the World Bank has generated significant debate with regard to the true picture of inequality in the Indian economy.
- The report outlined a number of salutary outcomes; not only had extreme poverty reduced drastically, inequality had reduced too.
- The Gini coefficient — a measure of inequality that ranges from 0 to 1, with 1 indicating extreme inequality — had fallen from 0.288 in 2011-12 to 0.255 in 2022-23, making India an economy with one of the lowest levels of inequality in the world.

What followed?

- This finding was highlighted by the government as a vindication of its growth policies and economic management.
- However, as plenty of commentators have pointed out, the facts highlighted by the World Bank do not provide a true picture of inequality in the country.
- While inequality in consumption may be low — which is in itself a contested fact — income and wealth inequality in India are extremely high and have increased over time, making India one of the most unequal economies in the world.

1. The World Bank's Findings on Inequality

- A recent World Bank report has claimed a reduction in both poverty and inequality in India.
- According to the report, the Gini coefficient for consumption inequality fell from 0.288 in 2011-12 to 0.255 in 2022-23, placing India among the countries with the lowest inequality globally.
- The Indian government highlighted this as validation of its economic policies.

2. The Problem with Using Consumption Inequality

- Critics argue that the World Bank's measure is misleading because it focuses on consumption inequality, not income or wealth inequality. Consumption inequality tends to appear lower because:
- Poorer households spend almost all their income, while richer households save more.
- Rising incomes do not proportionally increase consumption.
- The data sources, particularly the Household Consumption Expenditure Surveys (HCES), have methodological inconsistencies and fail to capture high-income earners accurately.
- Thus, consumption inequality may show improvement even if income and wealth inequality are worsening.

3. True Picture: Income and Wealth Inequality

- According to research by the World Inequality Database (WID) led by Thomas Piketty, income and wealth inequality in India are extremely high and have worsened over time:
- The Gini coefficient for income rose from 0.47 in 2000 to 0.61 in 2023, placing India among the top unequal economies globally.
- The Gini coefficient for wealth increased from 0.70 in 2000 to 0.75 in 2023, showing an even higher concentration of wealth.
- These figures suggest that the narrative of falling inequality does not reflect the true distribution of income and assets in India.

4. Extreme Concentration at the Top

- Beyond the Gini index, wealth concentration at the very top tells a more alarming story:
- The top 1% of Indians own nearly 40% of the country's net personal wealth.
- Globally, only Uruguay, Eswatini, Russia, and South Africa have higher wealth concentration levels.
- The Gini coefficient, as an average measure, masks such extreme disparities in wealth ownership.

5. The Paradox of Rising Income with Falling Consumption Inequality

- The apparent contradiction—rising income and wealth inequality alongside falling consumption inequality—can be explained:

- As incomes rise, the poor consume more, while the rich save more.
- Therefore, consumption inequality may decline even when income and wealth inequalities are growing.
- Some experts argue that real incomes of the poor may not have risen significantly, questioning the very basis of falling consumption inequality.

6. Broader Implications

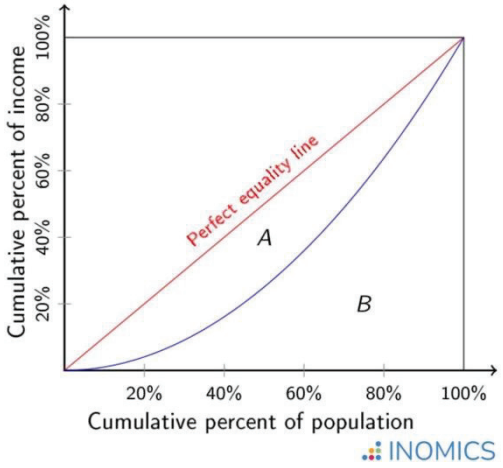
- The concentration of wealth and income in India reflects a deep structural inequality.
- While consumption figures show modest improvements, they obscure rising economic disparity.
- This imbalance threatens long-term growth, as excessive inequality can hinder inclusive development, reduce demand, and concentrate economic power in the hands of a few.

Gini coefficient

- The Gini coefficient (also called the Gini index or Gini ratio) is a statistical measure used to represent income or wealth inequality within a population. It's widely used in economics and social sciences.

Definition

- The Gini coefficient ranges between:
- 0 = perfect equality (everyone has the same income)
- 1 = perfect inequality (one person has all the income, everyone else has none)



In practice:

- A Gini coefficient of 0.3 or lower is considered relatively equal.
- A Gini coefficient of 0.4–0.5 suggests moderate inequality.
- A Gini coefficient above 0.5 reflects high inequality.

How It's Calculated

- It's derived from the Lorenz curve, which plots the cumulative percentage of total income received against the cumulative percentage of recipients, starting with the poorest.

Examples (Approximate)

Country	Gini Coefficient
Sweden	~0.28 (low inequality)
USA	~0.41 (moderate inequality)
South Africa	~0.63 (high inequality)

World Bank

- The World Bank is an international financial institution that provides loans and grants to the governments of poorer countries for the purpose of pursuing development projects.

Key Facts:

- Founded: 1944 at the Bretton Woods Conference
- Headquarters: Washington, D.C., USA
- Members: 189 countries
- President (as of mid-2025): Ajaypal Singh Banga

Main Institutions within the World Bank Group:

- The World Bank Group actually consists of five organizations, but the term "World Bank" usually refers to the first two:

International Bank for Reconstruction and Development (IBRD):

- Lends to middle-income and credit-worthy low-income countries.

International Development Association (IDA):

- Offers interest-free loans and grants to the poorest countries.

Other World Bank Group institutions:

- International Finance Corporation (IFC) – Focuses on private sector development.
- Multilateral Investment Guarantee Agency (MIGA) – Provides political risk insurance.
- International Centre for Settlement of Investment Disputes (ICSID) – Handles investment disputes.

Goals:

- End extreme poverty (reduce the percentage of people living on less than $2.15/day to 3% or less)
- Promote shared prosperity (foster income growth for the bottom 40% in every country)

Activities:

- Funding projects like roads, schools, clean water, and energy infrastructure.
- Providing technical expertise and policy advice.
- Offering research and data on global development.

QUESTIONS

17. What is the difference between asteroids and comets?

1. Asteroids are small rocky planetoids, while comets are formed of frozen gases held together by rocky and metallic material.
2. Asteroids are found mostly between the orbits of Jupiter and Mars, while comets are found mostly between Venus and Mercury.
3. Comets show a perceptible glowing tail, while asteroids do not.

Which of the statements given above is/are correct?

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

18. With reference to wealth inequality in India, which of the following statements is/are correct?

1. The top 1% of Indians own nearly 40% of the country's net personal wealth.
2. Inequality in India has come down significantly between 2011-12 and 2022-23, making it the fourth-most equal country globally, according to a World Bank report.
3. The Gini coefficient for wealth was higher than that for income in 2023.

Select the correct answer using the code below:

A. 1 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

19. Which of the following best explains why consumption inequality may appear lower than income inequality in India?

A. Consumption is easier to measure than income.

B. The rich consume more in proportion to their income.

C. Poor households spend most of their income, while rich households save more.

D. The Gini coefficient does not apply to consumption data.

20. Which of the following statements best explains the paradox of rising income inequality and falling consumption inequality in India?

A. Rich households underreport their consumption, making inequality appear low.

B. Income inequality data is outdated, while consumption data is more current.

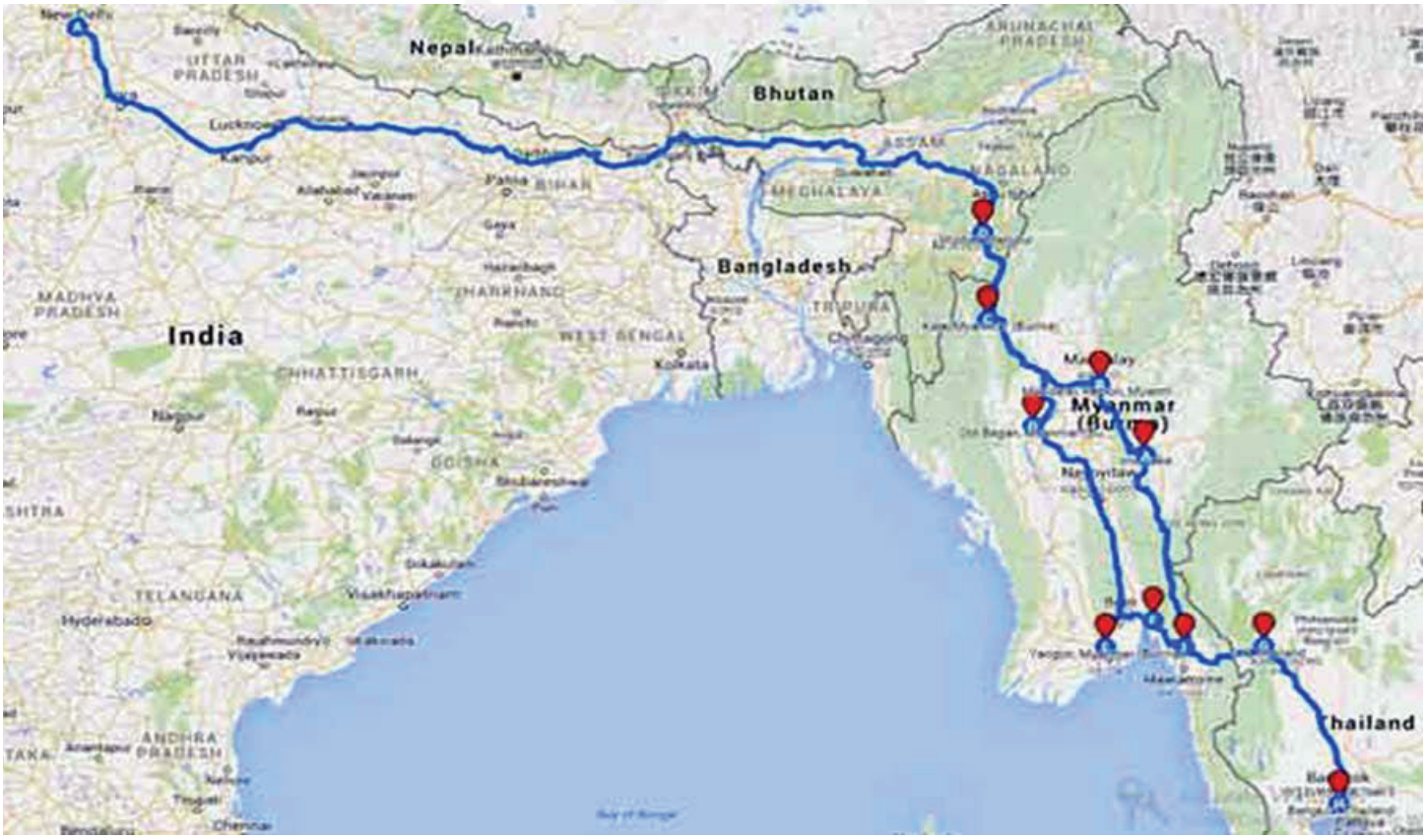
C. Rich households consume much more than the poor, increasing total consumption.

D. Rising income leads to increased savings by the rich, reducing measured consumption inequality.

6. Ethnic conflict in Myanmar drives Chin people to Mizoram

- A battle between two ethnic armed groups in Myanmar has forced some 4,000 Chin people in the country to take refuge in Mizoram.
- Waves of Myanmar nationals began crossing a border bridge at Zokhawthar and the Tiau River since the gunfights broke out on July 3, 2025. The river demarcates a part of the 510 km border between Mizoram and Myanmar.
- "The refugees are taking shelter in the houses of their relatives, schools, and community halls.
- They are concentrated in the Zokhawthar and Vaphai villages,".
- The Chins of Myanmar, and the dominant Mizos of Mizoram are members of the greater Zo community, as are the Kukis, Zomis, Hmars, and Kuki-Chins (Bangladesh). It is not unusual for these ethnic groups to have relatives on either side of the border.
- According to community elders in Zokhawthar, the refugees started trickling in after observing the movement of armed men in areas close to the border less than a week ago.
- The two groups are part of the People's Defence Force that is leading a resistance movement against Myanmar's military junta, which captured power through a coup in 2021.
- "Given the volatile situation across the border, we have not asked these refugees, many of them women and children, to go back.
- More than 30,000 refugees from Myanmar and Bangladesh have been living in Mizorams since before the arrival of the 4,000 Chin people. About 2,000 Kuki-Chin refugees from Bangladesh arrived two years ago following clashes between their community-based armed ethnic group and Bangladeshi security forces.
- Apart from the refugees, more than 5,000 Kuki-Zo people displaced by the ethnic violence in adjoining Manipur have also been taking shelter in Mizoram since 2023.

India–Myanmar relations



1. Historical & Strategic Context

- India–Myanmar ties span shared culture, trade, and strategic interests. India is Myanmar's 4th largest export partner, and both are engaged through ASEAN, BIMSTEC, and development initiatives like the Kaladan Project and the India–Myanmar–Thailand Highway
- India's involvement includes economic aid, defense cooperation, and connectivity projects—though many face delays due to ongoing instability in Myanmar.

2. Conflict Dynamics & Border Security

- Since the 2021 military coup in Myanmar, ethnic insurgencies and civil war (especially in Chin, Sagaing, Kachin regions) have created ungoverned zones that insurgent groups—some tied to Northeast India—exploit
- Groups like ULFA-I, NSCN-K(YA), PLA, and Kuki-Chin rebel militias use Myanmar territory to regroup and launch attacks into Indian states like Manipur and Nagaland
- India–Myanmar joint military efforts—like Operation Sunrise in 2019—focused on dismantling such camps across the border

3. Recent Cross-Border Tensions & Developments (2025)

Security Incidents

- In May 2025, Indian Assam Rifles killed ten members of Myanmar's Tamu People's Defense Organization near Tamu, marking a rare direct cross-border confrontation and sparking conflicting narratives over the incident
- ULFA-I claimed drone strikes killed three leaders in Sagaing region, while Indian authorities denied involvement—yet confirmed deaths at ULFA camps, potentially due to Myanmar's internal conflict

Refugees & Humanitarian Spillover

- Thousands of ethnic Chin refugees fled into Mizoram in July, though many have now returned following local militia truces. Still, about 850 remain stranded within India awaiting stability
- India is weighing the need for border fencing (e.g. in Mizoram's Hnahthial district), balancing terrain, local opinion, and security vulnerabilities

Diplomatic Engagement

- Indian diplomacy remains complex: it continues to engage Myanmar's military regime for security, while also reaching out to anti-junta groups and ethnic representatives—India hosted a seminar involving the National Unity Government in 2024
- The March 2025 Earthquake in Myanmar prompted India's "Operation Brahma": swift medical and disaster relief efforts, which enhanced its humanitarian footprint in the region.
- India has expressed concern over Myanmar instability impacting its security, flagging issues like drug trafficking and arms smuggling—MEA emphasised engagement with all stakeholders

4. Key Challenges & Strategic Balances

Challenge	Context
Refugee Influx & Local Ethnic Tensions	~95,000 Myanmar refugees entered India post-coup—raising demographic and political friction in Manipur (Meitei vs Kuki-Chin communities)
Insurgent Movement & Crime Spillover	Drug trafficking, arms smuggling, and militant infiltration have surged via porous borders including Moreh, Tamu, and Zokhawthar.
Connectivity Projects Disrupted	Kaladan Project and the Trilateral Highway have stalled due to Rakhine unrest, the Arakan Army insurgency, and logistical issues.

Diplomatic Paradox	India balances between supporting democratic transition and working with junta for border security; engaging both sides risks legitimacy trade-offs.

5. Present Situation (Mid-July 2025)

- Security environment remains tense along the 1,640 km Indo-Myanmar border. Operations continue against insurgents and Chinese influence in Myanmar challenges India's strategic objectives.
- Humanitarian situation somewhat stabilised, with refugee returns underway, though displacement and ethnic tensions persist in Mizoram and Manipur.
- Border fencing efforts are being surveyed and prioritized to counter illicit movement while considering local views.
- **India's approach remains nuanced:** continuing security collaboration with Myanmar's junta, offering humanitarian relief and semi-open engagement to anti-junta forces, and supporting regional connectivity—despite geopolitical friction and project delays.

QUESTIONS

21. Which of the following statements best explains the reason for the recent influx of Chin refugees from Myanmar into Mizoram in July 2025?

A. Military airstrikes by Myanmar on India's border villages.

B. Clashes between Myanmar's military junta and Indian armed forces.

C. Armed conflict between ethnic armed groups within the Chin region.

D. A severe earthquake in Myanmar's Chin state.

22. Which of the following insurgent groups have been reported to operate across the India–Myanmar border?

1. ULFA-I
2. NSCN-K (Yung Aung faction)
3. People's Defence Force (Myanmar)
4. PLA (People's Liberation Army – Manipur)

Select the correct answer using the code below:

A. 1, 2 and 3 only

B. 2, 3 and 4 only

C. 1, 2 and 4 only

D. 1, 2, 3 and 4

23. With reference to recent India–Myanmar engagements post-2021 coup, which of the following statements is/are correct?

1. India has provided humanitarian relief to Myanmar after natural disasters.
2. India has completely stopped all engagement with Myanmar's military regime.
3. India hosted a seminar involving the National Unity Government (NUG) of Myanmar.

Select the correct answer using the code below:

A. 1 and 3 only

B. 2 and 3 only

C. 1 and 2 only

D. 1, 2 and 3

7. Gujarat launches India's first tribal genome project to tackle inherited diseases

- Gujarat has become the first Indian State to launch a genome sequencing initiative focused exclusively on tribal communities.
- The Tribal Genome Sequencing Project was announced with the aim of identifying genetic health risks and enabling precision healthcare for tribal populations.
- The initiative will sequence the genomes of 2,000 individuals from tribal communities across 17 districts in the State.
- The project, titled "Creation of Reference Genome Database for Tribal Population in Gujarat", is being implemented by the Gujarat Biotechnology Research Centre (GBRC) and is part of the 2025–26 State budget.

Detecting genetic disorders

- Mr. Dindor said the initiative will focus on early detection and targeted treatment of genetic disorders such as sickle cell anaemia, thalassaemia, and certain hereditary cancers.
- The genetic data collected will also be used to identify markers related to natural immunity and support the development of personalised healthcare solutions.
- The project will incorporate advanced infrastructure for sample collection, sequencing, and interpretation of genetic data.
- Experts at the event stressed that the initiative is not limited to scientific research but aims to empower tribal communities through the use of advanced technology and data.
- The project will involve state-of-the-art facilities for sample collection and genetic analysis.

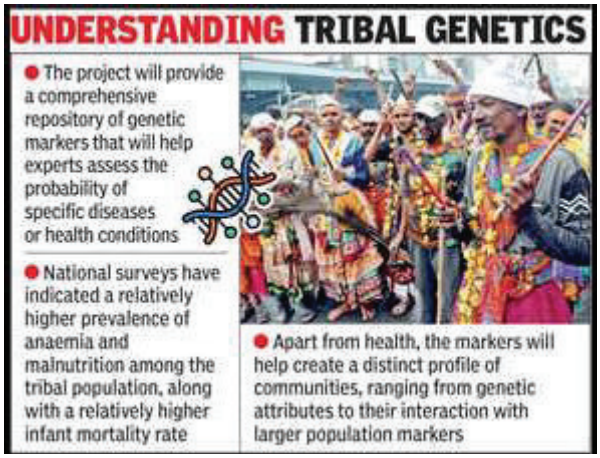
Genome Sequencing

- Genome Sequencing is the process of determining the complete DNA sequence of an organism's genome at a single time.
- It involves identifying the order of the four nucleotide bases—adenine (A), cytosine (C), guanine (G), and thymine (T)—in the DNA.

Key Concepts of Genome Sequencing

- **Genome:** The entire set of DNA in an organism, including all of its genes.

- **Sequencing:** The process of determining the exact order of nucleotides.
- **Technologies Used:**
  - **Sanger Sequencing (first-generation):** Accurate but slow; used for small genomes.
  - **Next-Generation Sequencing (NGS):** Much faster and cheaper; can handle large-scale sequencing.
  - **Third-Generation Sequencing:** Includes long-read methods like PacBio and Oxford Nanopore, which can read longer DNA fragments.



- **Steps in Genome Sequencing**
  - **DNA Extraction:** Isolate DNA from the cells.
  - **DNA Fragmentation:** Cut DNA into smaller, manageable pieces.
  - **Library Preparation:** Add adapters to DNA fragments for sequencing.
- **Sequencing:** Use sequencing machines to determine the order of nucleotides.
- **Assembly:** Align and merge short sequences into a complete genome.
- **Annotation:** Identify genes, regulatory elements, and other features in the sequence.

Applications of Genome Sequencing

- Medical Diagnostics (e.g., identifying genetic disorders)
- Personalized Medicine (tailoring treatment to individual genomes)
- Evolutionary Biology (studying relationships among species)
- Agriculture (breeding crops/livestock with desirable traits)
- Microbial Genomics (tracking outbreaks, studying microbiomes)

Examples of Genome Projects

- **Human Genome Project**: First complete sequence of the human genome (2003)
- **1000 Genomes Project:** Global effort to study human genetic variation
- **Earth BioGenome Project:** Aims to sequence all eukaryotic life on Earth

QUESTIONS

24. Consider the following statements regarding the Tribal Genome Sequencing Project launched in Gujarat:

1. It aims to create a reference genome database specifically for tribal populations.
2. The project will sequence 10,000 individuals from 36 tribal districts in Gujarat.
3. It is implemented by the Gujarat Biotechnology Research Centre (GBRC).

Which of the statements given above is/are correct?

A. 1 and 2 only

B. 1 and 3 only

C. 2 and 3 only

D. 1, 2 and 3

25. Which of the following diseases are explicitly targeted for early detection and treatment under the Gujarat Tribal Genome Project?

1. Sickle cell anaemia
2. Tuberculosis
3. Thalassaemia
4. Hereditary cancers

Select the correct answer using the code below:

A. 1 and 2 only

B. 2 and 4 only

C. 1, 3 and 4 only

D. 1, 2, 3 and 4

26. Which of the following best describes the main scientific aim of genome sequencing?

A. To produce antibodies for immunization programs.

B. To determine the exact sequence of nucleotides in an organism's DNA.

C. To compare protein structures of different species.

D. To classify microorganisms based on cell wall composition.

8. New Caledonia to Become New State within French Republic

- France has announced a historic deal with New Caledonia in which the South Pacific overseas territory will be declared a new state.
- The 13-page accord, reached after negotiations in Paris, proposes the creation of a State of New Caledonia, within the French Republic, inscribed in the French constitution, and the creation of a Caledonian nationality alongside French nationality.
- The deal also calls for an economic and financial recovery pact that would include a renewal of the territory's nickel processing capabilities.
- The agreement hailed by French President Emmanuel Macron as historic still needs final approval in New Caledonia.
- The accord may face a vote by New Caledonians in February.

- France colonised the Pacific archipelago in the 1850s, and it became an overseas territory after World War II, with French citizenship granted to all Kanaks in 1957.
- The last independence referendum in New Caledonia was held in 2021.

New Caledonia

- New Caledonia is a French overseas territory located in the southwest Pacific Ocean.

Location:

- Southwest Pacific, east of Australia, north of New Zealand.

Political Status:

- A special collectivity of France (collectivité sui generis).
- Has its own Congress and government, but France retains control over defense, foreign policy, and currency.
- Referendums on independence were held in 2018, 2020, and 2021 — all voted to remain French, though with decreasing voter participation and rising tensions.

Capital:

- Nouméa

Population:

- Approx. 270,000 (as of 2024)

Ethnic Groups:

- Indigenous Kanak people (Melanesian origin)
- Europeans (mostly French)
- Polynesians, Indonesians, Vietnamese, and others

Languages:

- French (official)
- Over 30 indigenous Kanak languages

Currency:

- CFP Franc (XPF), shared with other French Pacific territories

Economy:

- Rich in nickel (one of the world's largest reserves)
- Tourism, agriculture, and financial aid from France

Environment:

- Famous for lagoon biodiversity — one of the largest lagoons in the world, a UNESCO World Heritage Site
- Tropical climate, coral reefs, rainforests, and endemic species

Kanak People:

- The Kanak people are the indigenous Melanesian inhabitants of New Caledonia, a French territory located in the southwest Pacific Ocean.

Who are the Kanak?

- **Ethnic Group:** The Kanak are part of the Melanesian group of peoples, indigenous to the southwest Pacific.
- **Population:** As of recent estimates, Kanaks make up about 40–45% of New Caledonia's population.
- **Languages:** They speak over 30 indigenous languages, all part of the Austronesian language family. French is also widely spoken due to colonization.

Geographical Context

- New Caledonia is located east of Australia and north of New Zealand.
- It consists of a main island (Grande Terre), the Loyalty Islands, and several smaller islands.
- The Kanak population is concentrated in the Northern Province and Loyalty Islands, with fewer living in the more urbanized Southern Province.

History

- **Pre-Colonial Era:** Kanak society was organized into tribes and clans, with a strong emphasis on land, ancestry, and oral tradition.

Colonial Era:

- France colonized New Caledonia in 1853.
- Many Kanak were displaced from their lands and subjected to discriminatory policies.
- A system of "indigénat" imposed forced labor, curfews, and restrictions on movement.

Modern Political Movements:

- The Kanak independence movement gained momentum in the 1980s.
- Political unrest led to the Matignon Accords (1988) and the Nouméa Accord (1998), providing greater autonomy and a path to potential independence.
- Three referenda (2018, 2020, 2021) on independence have been held. All resulted in a vote to remain with France, although the last was boycotted by pro-independence groups.

Culture

- **Strong Ties to Land:** Land is sacred and central to Kanak identity and social structure.
- **Customary Authority:** Chiefs and clan elders hold significant influence.

Art & Symbolism:

- Famous for wood carvings, especially tiki figures and totemic sculptures.
- Traditional Kanak houses feature conical thatched roofs and symbolic carvings.

QUESTIONS

27. With reference to the proposed constitutional change regarding New Caledonia, consider the following statements:

1. The agreement proposes the creation of an independent State of New Caledonia outside the French Republic.
2. A new Caledonian nationality will be created alongside French nationality.
3. The accord includes provisions for revamping the territory's nickel processing sector.

Which of the statements given above is/are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

28. Consider the following statements regarding New Caledonia:

1. It is a French overseas collectivity located in the South Atlantic.
2. It uses the Euro as its currency.
3. It has one of the world's largest reserves of nickel.

Which of the statements given above is/are correct?

A. 1 only

B. 2 and 3 only

C. 3 only

D. 1, 2 and 3

29. Which of the following islands or regions are part of New Caledonia?

1. Grande Terre
2. Loyalty Islands
3. Galapagos Islands

Select the correct answer using the code given below:

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

9. Merger of two black holes, 100 times bigger than the Sun

A Groundbreaking Discovery in Astrophysics

- In a major scientific breakthrough, researchers have detected gravitational waves from the merger of two black holes—each far more massive than any previously observed in such an event.
- One of the black holes was about 140 times the mass of the Sun, and the other around 100 times larger.
- Their merger resulted in a colossal black hole approximately 225 times the Sun's mass, making it the biggest black hole merger ever recorded via gravitational waves.
- This detection has sparked significant interest in the scientific community, as it challenges existing theories about the formation and limits of black holes.

Understanding Gravitational Waves

- Gravitational waves are ripples in the fabric of spacetime, caused by the acceleration of massive objects—much like how a boat creates ripples as it moves through water.
- Predicted by Albert Einstein in his General Theory of Relativity in 1915, these waves remained undetected for a century.

- It wasn't until 2015 that scientists, using the Laser Interferometer Gravitational-Wave Observatory (LIGO) in the United States, confirmed their existence.
- These waves are incredibly faint and require extremely sensitive equipment to detect.
- Only the most powerful cosmic events—like black hole mergers—produce gravitational waves strong enough to reach Earth and be measured.

The Role of LIGO and the LVK Collaboration

- LIGO consists of two observatories in the United States that made the first gravitational wave detection.
- Since then, the global collaboration known as LVK—comprising LIGO, Virgo (Italy), and KAGRA (Japan)—has discovered gravitational waves from hundreds of similar cosmic events. The latest finding, involving the most massive black holes yet, was also made through this collaboration.
- This observation provides not just a new record, but potentially a new category of black hole formation that defies current scientific understanding.

Why This Discovery Is So Significant

- The recent event stands out because it involves black holes in a mass range (100–150 times that of the Sun) that is thought to be unlikely or even impossible under prevailing theories.
- According to existing models of stellar evolution, stars massive enough to produce black holes of this size range are expected to undergo a phenomenon called pair-instability supernova, which would blow the star apart and prevent black hole formation.

- Moreover, at least one of the merging black holes was spinning at a speed close to the theoretical limit allowed by Einstein's equations—an extremely rare and intriguing characteristic.
- These anomalies suggest there may be unknown mechanisms or evolutionary paths that can create such massive and fast-spinning black holes.

A New Way of Observing the Universe

- Before gravitational waves were detected, scientists depended largely on electromagnetic waves—such as light, radio waves, and X-rays—to study space.
- However, many parts of the universe, including regions containing dark matter and dark energy, do not interact with electromagnetic radiation and remain invisible to traditional telescopes.
- Gravitational waves provide a completely new tool to observe these hidden parts of the universe.
- They offer insights into cosmic phenomena that were previously beyond our observational reach, such as black holes, neutron star collisions, and other extreme events.

The Promise of LIGO-India

- To expand the global network of gravitational wave observatories, a third LIGO facility has been proposed in India.
- Called LIGO-India, the observatory is set to be built in the Hingoli district of Maharashtra.
- Although the project has faced delays, it received final government approval in 2023, with a budget allocation of Rs. 2,600 crore.
- The Department of Atomic Energy is overseeing the project, and construction is now expected to begin later this year.
- If everything goes according to plan, the observatory will be operational by April 2030.
- Once completed, LIGO-India will significantly enhance the ability of scientists to pinpoint the origin of gravitational waves, improving both accuracy and frequency of detections.

Looking Ahead: Unlocking the Universe's Mysteries

- The discovery of gravitational waves from this exceptional black hole merger marks a new milestone in astrophysics.
- It opens up possibilities for refining existing theories about black hole formation, stellar evolution, and even our understanding of the universe's structure.
- As more such events are observed and new observatories come online, especially LIGO-India, scientists are optimistic that gravitational wave astronomy will continue to uncover deeper cosmic truths, offering humanity an unprecedented view of the invisible and mysterious universe.

General Theory of Relativity

- The General Theory of Relativity, proposed by Albert Einstein in 1915, is one of the two pillars of modern physics (alongside quantum mechanics). It fundamentally changed our understanding of gravity, space, and time.

Core Ideas of General Relativity:

1. Gravity is Geometry

- Unlike Newtonian gravity, where gravity is a force between masses, Einstein proposed that:

- Mass and energy curve spacetime, and that curvature tells objects how to move.
- This idea is often summed up by physicist John Archibald Wheeler:
- "Spacetime tells matter how to move; matter tells spacetime how to curve."

2. Spacetime

- Space and time are unified into a four-dimensional continuum called spacetime.
- Massive objects like stars and planets distort this spacetime, and the curvature affects the motion of other objects — what we perceive as gravity.

3. Equivalence Principle

- **Einstein's starting point:** The effects of gravity are locally indistinguishable from acceleration.
- **Example:** If you're in a sealed elevator, you can't tell whether the force you feel is due to gravity or the elevator accelerating upward.

Gravitational Time Dilation

- Clocks run slower in stronger gravitational fields.
- Proven using atomic clocks on airplanes and satellites (like GPS systems).

Bending of Light by Gravity

- Light follows curved paths in curved spacetime (gravitational lensing).
- Confirmed during the 1919 solar eclipse by Eddington.

Gravitational Waves

- Ripples in spacetime caused by accelerating massive objects (e.g., colliding black holes).
- Detected directly by LIGO in 2015.

Black Holes

- Points of infinite density (singularities) where spacetime curvature becomes infinite.
- Predicted by GR and observed via gravitational wave detections and images (e.g., M87 black hole).

Applications

- Understanding the expansion of the universe
- Describing black holes and neutron stars
- GPS satellite time corrections
- Predicting gravitational lensing in astrophysics

QUESTIONS

30. Which of the following statements correctly explains the significance of gravitational wave detection?

A. It helps directly visualize black holes through telescopes.

B. It allows scientists to study cosmic events that emit no electromagnetic radiation.

C. It proves the quantum nature of gravitational forces.

D. It is only useful for observing supernova explosions.

31. Why is the recent black hole merger discovery considered a challenge to existing stellar evolution theories?

A. It involved the first ever observed black hole merger.

B. The resulting black hole emitted gamma-ray bursts.

C. The masses of the merging black holes lie in a theoretically "forbidden" range.

D. The black holes were formed during the Big Bang.

32. Which of the following accurately describes the role of LIGO-India?

A. It is India's first optical telescope to observe distant galaxies.

B. It will enhance India's ability to manufacture gravitational wave detectors.

C. It will act as a third node in the global gravitational wave detection network.

D. It aims to detect neutrinos from solar flares.

33. Which of the following is/are true about gravitational waves?

1. They travel at the speed of light.
2. They were first directly detected in 2015.
3. They are produced by the movement of charged particles in a magnetic field.
4. Their detection requires highly sensitive equipment.

Select the correct answer using the codes below:

A. 1, 2 and 4 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2, 3 and 4

34. According to Einstein's General Theory of Relativity, what causes gravitational force?

A. The presence of dark matter in space.

B. The interaction of particles through gravitons.

C. The curvature of spacetime caused by mass and energy.

D. The rotation of massive celestial bodies.

35. Recently, scientists observed the merger of giant 'black holes' billions of light years away from the Earth. What is the significance of this observation?

A. 'Higgs boson particles' were detected.

B. 'Gravitational waves' were detected.

C. Possibility of inter-galactic space travel through 'wormhole' was confirmed.

D. It enabled the scientists to understand 'singularity'.

10. India's First ISS Astronaut Shubhanshu Shukla Returns Safely

- India celebrated a monumental achievement in its space journey as Group Captain Shubhanshu Shukla, an Indian Air Force pilot, safely returned to Earth.
- This marked the first time an Indian national visited the International Space Station (ISS)—a major leap forward for the country's growing presence in human spaceflight.
- Shukla was part of the Axiom-4 mission, a private spaceflight organized by Axiom Space, and traveled aboard SpaceX's Crew Dragon capsule named "Grace."
- The capsule splashed down in the Pacific Ocean, off the coast of California, at approximately 3:01 pm IST, concluding a successful 22-hour return journey from orbit that involved a high-speed, fiery reentry into Earth's atmosphere.
- This moment not only celebrated Shukla's pioneering spaceflight but also reaffirmed India's commitment to space science and exploration on a global scale.

The Mission Crew: A Multinational Collaboration

- Group Captain Shukla was joined by a distinguished international crew:
- **Peggy Whitson (USA):** A veteran astronaut with multiple spaceflights and one of NASA's most experienced space travelers.
- **Slawosz Uznanski-Wisniewski (Poland):** The first Polish astronaut to visit the ISS.
- **Tibor Kapu (Hungary):** The first Hungarian to reach the ISS.
    - The Axiom-4 mission represents a collaborative effort across nations, emphasizing the increasing globalization of space exploration.

- With participants from India, Poland, and Hungary, the mission has contributed to each of these countries reaching historic milestones in space.

Mission Overview: A Pioneering Journey

Launch and Duration

- The mission launched from NASA's Kennedy Space Center in Florida on June 25, with the crew docking at the ISS on June 26.
- Over the next two weeks, the team participated in a wide range of scientific experiments, educational outreach, and space operations.

Return to Earth

- On July 15) at 2:00 pm IST, the crew boarded Dragon Grace to begin their return journey.
- After undocking from the ISS, the capsule completed a carefully planned descent, ultimately splashing down safely on July 16.

India's Milestone: Shukla's Space Legacy

- Group Captain Shubhanshu Shukla has now etched his name in history as the second Indian to fly to space, after Rakesh Sharma's iconic 1984 mission aboard the Soviet Soyuz T-11.
- However, Shukla's journey to the ISS represents a new era of Indian human spaceflight, as it is the first mission in collaboration with private and international space organizations.
- ISRO (Indian Space Research Organisation) hailed the mission as a "milestone for the country's space ambitions," highlighting its importance as a precursor to India's first indigenous human spaceflight mission, Gaganyaan, scheduled for 2027.

Scientific Achievements and Microgravity Experiments

- During the mission, Shukla and his crewmates conducted seven planned experiments in microgravity, all of which were completed successfully.
- ISRO outlined the following key experiments that carry both scientific and practical implications for long-term space habitation and Earth-based applications:
  - **Indian Strain of Tardigrades** – Research on one of Earth's most resilient microscopic organisms.
  - **Myogenesis** – Studying muscle cell development in microgravity.
  - **Seed Sprouting** – Observing the growth of methi and moong seeds in space conditions.
  - **Cyanobacteria and Microalgae** – Experiments related to life support systems and bioresource utilization in space.
  - **Crop Seed Behavior –** Studying seed viability and growth in orbit.
  - **Voyager Display** – A technology demonstrator and cultural display.
- These experiments were not only novel in their design but also serve to lay the groundwork for future long-duration missions, especially in the context of India's plans to maintain human presence in space through Gaganyaan and beyond.

Orbit Accomplishments: A Journey Around Earth

- While aboard the ISS, Shukla circled Earth more than 310 times, covering an estimated 13 million kilometers—a distance equivalent to 33 trips to the Moon and back. In the unique orbital environment, the crew witnessed over 300 sunrises and sunsets, highlighting the spectacular and surreal nature of life in space.

National Reactions: Pride and Promise

ISRO's Celebration

- ISRO expressed immense pride in Shukla's achievements, emphasizing that the mission had achieved all its goals. Officials described it as a turning point for Indian space science, especially in manned space research.

Government Commendation

- Union Minister Dr. Jitendra Singh called the mission a "moment of pride for the world, a moment of glory for India."
- He emphasized that Shukla's successful return was more than symbolic—it was a declaration that India now holds a permanent and growing position in the global space ecosystem.
- "These are experiments that have never been done before," Dr. Singh stated, underlining the originality and scientific ambition of the mission.
- He also announced that the mission would serve as a catalyst for long-term advancements in India's technological and research capabilities.

Post-Mission Protocol: Medical Checks and Debriefings

- After splashdown, all four astronauts were transported to a secure location for post-flight medical examinations and re-adaptation procedures.
- They will remain in quarantine until July 23 to monitor their health and allow their bodies to readjust to Earth's gravity.
- Beginning July 24, debriefings with ISRO, Axiom Space, and NASA are scheduled to take place.
- These sessions will allow the teams to analyze mission data, assess experiment results, and prepare for future collaborations.

SpaceX and Axiom: A New Era of Space Travel

- The Axiom-4 mission was the 18th human spaceflight conducted by SpaceX since it started flying astronauts in 2020.
- The Dragon capsule "Grace" is part of SpaceX's expanding Crew Dragon fleet, and the successful mission reaffirms the company's role in shaping the future of commercial and governmental spaceflight.
- Axiom Space, which aims to build the first commercial space station, sees such missions as key stepping stones.
- Axiom-4 has successfully demonstrated the feasibility of international and private collaboration in space science, research, and diplomacy.

India's Rising Space Power

- Group Captain Shubhanshu Shukla's mission is not just a triumph for him or the Indian Air Force—it is a triumph for India and humanity at large. His safe return signifies India's readiness to take a leading role in global space exploration and scientific advancement.
- The mission serves as a prelude to Gaganyaan, India's first planned crewed spaceflight, and opens up new possibilities for commercial partnerships, international collaboration, and innovative research in orbit.

36. Group Captain Shubhanshu Shukla became the second Indian to go to space. Who was the first Indian, and how was the nature of their missions different?

A. Kalpana Chawla and both missions were conducted by ISRO

B. Sunita Williams and both went to the ISS

C. Rakesh Sharma and Shukla's mission involved international private collaboration

D. Rakesh Sharma and both missions used Soyuz capsules from Russia

37. Which of the following experiments were conducted by Shubhanshu Shukla during the Axiom-4 mission?

1. Seed sprouting in space
2. Microgravity effects on muscle cells
3. Human genome sequencing in orbit
4. Study of tardigrades in Indian conditions

Select the correct answer using the code below:

A. 1, 2 and 3 only

B. 1 and 4 only

C. 1, 2 and 4 only

D. All four

38. What was significant about the Axiom-4 mission in terms of international collaboration?

A. It was India's first joint mission with the European Space Agency.

B. It was the first fully Asian crew to visit the ISS.

C. It included astronauts from India, Hungary, and Poland visiting the ISS for the first time.

D. It was the first time NASA operated a mission in collaboration with ISRO.

39. Which of the following statements about the Axiom-4 mission and India's space strategy is/are correct?

1. The mission was launched from the Kennedy Space Center in Florida.
2. It used ISRO's GSLV Mk III rocket.
3. It serves as a precursor to India's Gaganyaan mission.
4. The Dragon capsule "Grace" was reused from a previous manned mission.

Select the correct answer using the code below:

A. 1 and 2 only

B. 1 and 3 only

C. 2 and 4 only

D. 3 and 4 only

40. Which organization was responsible for conducting the Axiom-4 mission and managing the crew's space journey?

A. ISRO

B. Axiom Space and SpaceX

C. NASA and ESA

D. DRDO and NASA

ANSWER KEY AND EXPLANATION

1. B **Statement 1 is incorrect:** While most forts are in Maharashtra, Gingee Fort is in Tamil Nadu, so not all are in Maharashtra.

Statement 2 is correct: The forts include a variety of terrain types—hill forts, hill-plateau, coastal, island, and hill-forest forts.

Statement 3 is correct: Gingee Fort is the only fort located outside Maharashtra, included in Tamil Nadu.

2. B Pratapgad is correctly classified as a Hill-Forest Fort. Sindhudurg is a Coastal/Island Fort, correctly matched. Panhala is a Hill-Plateau Fort, correctly matched. Lohgad is a Hill Fort, not an Island Fort, hence pair 4 is incorrect.

3. A **Statement 1 is correct:** India currently has 44 World Heritage Sites.

Statement 2 is incorrect: The Moidams were added at the 46th session in New Delhi, not the 47th in Paris, so this is incorrect. Statement 2 was incorrectly marked as correct earlier; Moidams were inscribed at the 46th session (New Delhi), not the 47th (Paris).

Statement 3 is incorrect: Each State Party can propose only one site per year, not two. Statement 4 is correct: India is a member of the World Heritage Committee from 2021 to 2025.

4. A The forts reflect human interaction with the environment, military architecture, and cultural traditions over time, qualifying them under Cultural Landscape, within the broader Cultural Heritage category. The Maratha Military Landscape of India was nominated under criteria (iv) and (vi), recognizing their exceptional testimony to a living cultural tradition, their architectural and technological significance, and their deep associations with historic events and traditions.

5. B Among the listed sites, the following two were inscribed in 2023:

Shantiniketan – Inscribed during the 45th session of the World Heritage Committee held in September 2023, becoming India's 41st World Heritage Site.

Sacred Ensembles of the Hoysalas – Also inscribed in September 2023 at the same session.

The other two were inscribed earlier:

Rani-ki-Vav – Inscribed in 2014. Mahabodhi Temple Complex, Bodhgaya – Inscribed in 2002.

6. A **Statement 1 is incorrect:** The scheme is to be implemented for six years (not five), starting from 2025–26.

Statement 2 is correct: The scheme is inspired by the Aspirational Districts Programme of NITI Aayog.

Statement 3 is incorrect: The scheme involves convergence of 36 existing schemes across 11 departments, not only Centrally Sponsored Schemes — it includes state and private sector partnerships too.

7. B The Union Cabinet chaired by the Prime Minister Shri Narendra Modi approved the "Prime Minister Dhan-Dhaanya Krishi Yojana" for a period of six years, beginning with 2025-26 to cover 100 districts. 100 districts will be identified based on three key indicators of low productivity, low cropping intensity, and less credit disbursement. The 100 districts are selected based on three specific criteria:

1. Low agricultural productivity
2. Low cropping intensity
3. Low credit disbursement

8. B **Pair 1 is correct:** PM-KUSUM aims to solarize agricultural pumps and promote solar energy.

Pair 2 is incorrect: The National Beekeeping & Honey Mission (NBHM) is about supporting beekeeping, not pulse production.

Pair 3 is correct: Agriculture Infrastructure Fund (AIF) supports post-harvest management, such as storage and cold chains.

9. B **Statement 1 is incorrect:** PM-KISAN is a Central Sector Scheme, 100% funded by the Government of India, not co-funded by states. Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) is a Central-Sector scheme (100% funded by Government of India) launched in December 2018, to provide financial assistance to all land-holding farmer families across India.

Statement 2 is correct: The scheme provides ₹6,000 per year to eligible farmers, in three equal installments of ₹2,000.

Statement 3 is correct: The definition of a farmer's family includes the husband, wife, and minor children. Statement 4 is incorrect: The implementing agency is the Department of Agriculture and Farmers Welfare (DA&FW) under the Ministry of Agriculture, not NITI Aayog.

10. B KCC provides short-term credit for maintenance of farm assets such as machinery repairs, diesel, etc. This is considered a long-term capital investment, not short-term credit. Such purchases fall under term loans, not the short-term limit of KCC. KCC includes a component for household consumption needs, recognizing the cash flow dependency of farm households. Short-term credit is provided for post-harvest needs, including sorting, grading, transporting produce to the market, etc. These are capital-intensive, long-term activities not covered under short-term credit of KCC. They require term loans, sometimes under separate government schemes (e.g., PMAY or AIF).

11. B The Green Mobility Vision promotes carbon neutrality, public health, and electrification of vehicles, including freight and public transport. It also emphasizes walkable urban infrastructure and reduced car dependence. Statement 3 is incorrect because the vision seeks to accelerate—not phase out—electric mobility.

12. C Under the scheme, demand incentives will be extended to N2 and N3 category electric trucks, as defined under the Central Motor Vehicle Rules (CMVR). The N2 category includes trucks with a Gross Vehicle Weight (GVW) above 3.5 tonnes and up to 12 tonnes. The N3 category covers trucks with GVW exceeding 12 tonnes and up to 55 tonnes. PM E-DRIVE provides demand incentives for commercial electric vehicles including N2 and N3 category e-trucks, electric buses, and electric ambulances. Private passenger e-cars are not included in the scheme for direct financial incentives—those benefit only from reduced GST (5%).

13. B To qualify for incentives under the scheme: A 5-year or 5 lakh km warranty on battery is mandatory. A 5-year or 2.5 lakh km warranty on vehicle/motor is mandatory. Scrapping old polluting trucks is a required condition. Registration in a Smart City is not a condition.

14. C Interstellar objects are identified by their open-ended hyperbolic trajectories—unlike closed elliptical orbits of solar system bodies. These trajectories allow them to escape the solar system due to high speed and minimal gravitational deceleration.

15. D 3I/Atlas was moving at 60 kmph even at a distance of 670 million km from the Sun, which is unusually fast given the weak gravitational pull at such distances—indicating it had an external origin and is not gravitationally bound to the Sun.

16. B **Statement 1 is incorrect:** 'Oumuamua, the first interstellar object, did not show comet-like features, even though it exhibited unexplained acceleration.

Statements 2 and 3 are correct: Interstellar objects follow hyperbolic paths and analyzing them helps understand planetary formation and composition of alien solar systems.

17. B **Statement one is correct:** "Asteroids are small rocky planetoids, while comets are formed of frozen gases held together by rocky and metallic material."

Statement two is incorrect: "Asteroids are found mostly between the orbits of Jupiter and Mars, while comets are found mostly between Venus and Mercury." Comets develop a glowing tail (made of gas and dust) when they approach the Sun, due to the sublimation of ices. Asteroids do not have tails since they lack volatile components that can sublimate and form a coma or tail.

18. D **All three statements are correct:** The top 1% owns 40% of wealth. Inequality in India has come down significantly between 2011-12 and 2022-23, making it the fourth-most equal country globally, according to a World Bank report. The Gini coefficient for wealth was 0.75, while for income it was 0.61, so wealth inequality was higher.

19. C The poorer households spend almost all their income, while richer households save a substantial portion, leading to lower measured consumption inequality even if income inequality is high. This makes (c) the correct and most logical answer.

20. D It explains that as income rises, the rich tend to save more, and the poor increase consumption modestly, leading to a fall in consumption inequality despite rising income inequality.

21. B The influx of 4,000 Chin people into Mizoram was triggered by a battle between two ethnic armed groups in Myanmar, particularly within the Chin region. The refugees crossed into India around Zokhawthar following internal ethnic clashes, not direct confrontation with India or natural disaster.

22. D All four groups operate across the border: ULFA-I and PLA are Indian insurgent groups active in Assam and Manipur, respectively, using Myanmar as a base. NSCN-K (YA) operates in Nagaland-Manipur. PDF (Myanmar) is a resistance group against the junta and was involved in the recent Chin conflict. So, all are correct.

23. A **Statement 1 is correct:** India launched Operation Brahma in March 2025 to help Myanmar after an earthquake.

Statement 2 is incorrect: India continues limited engagement with the military junta for border security.

Statement 3 is correct: India hosted a seminar with the National Unity Government (NUG) in 2024, showing dual-track diplomacy.

24. B **Statement 1 is correct:** The aim is to build a reference genome database for tribal groups.

Statement 2 is incorrect: The project targets 2,000 individuals across 17 districts, not 10,000 from 36 districts.

Statement 3 is correct: It is being implemented by GBRC.

25. C The project focuses on inherited disorders like sickle cell anaemia, thalassaemia, and certain hereditary cancers. Tuberculosis, although prevalent, is not genetic and not mentioned in the context of this project.

26. B Genome sequencing is defined as the process of identifying the order of nucleotides (A, T, G, C) in the DNA of an organism. Other choices deal with unrelated fields such as immunology, proteomics, and microbiology classification.

27. B **Statement 1 is incorrect:** The new entity will be a state within the French Republic, not fully independent.

Statement 2 is correct: A Caledonian nationality will be introduced alongside French nationality.

Statement 3 is correct: The agreement includes a financial recovery pact with focus on nickel processing.

28. C **Statement 1 is incorrect:** New Caledonia is in the Southwest Pacific, not the Atlantic.

Statement 2 is incorrect: It uses the CFP Franc (XPF), not the Euro.

Statement 3 is correct: It has significant global reserves of nickel.

29. A Grande Terre and the Loyalty Islands are part of New Caledonia. Galapagos Islands belong to Ecuador, not France.

30. B Gravitational waves offer a new observational window into the universe, allowing scientists to detect phenomena like black hole mergers that do not emit light or any electromagnetic radiation. These waves travel through spacetime and can reach Earth even from dark, invisible regions of space.

31. C Under current models, black holes in the range of 100–150 solar masses are not expected due to pair-instability supernovae — which would cause such massive stars to blow apart rather than collapse into black holes. Hence, the discovery of a 140-solar-mass black hole contradicts existing theory.

32. C LIGO-India will join the international collaboration (LIGO-Virgo-KAGRA or LVK) to enhance global detection of gravitational waves. By adding a new observatory in a different location, it improves triangulation accuracy and helps determine the direction and origin of gravitational wave events more precisely.

33. A Gravitational waves travel at the speed of light, were first detected in 2015 by LIGO, and require extremely sensitive interferometers to measure. However, statement 3 is incorrect because gravitational waves are not caused by moving charges (that's electromagnetic radiation), but by the acceleration of massive objects like black holes or neutron stars.

34. C Einstein redefined gravity not as a force but as a geometric property of spacetime. According to General Relativity, mass and energy curve spacetime, and this curvature tells matter how to move — a radical departure from Newtonian mechanics.

35. B The merger of giant black holes results in the release of enormous energy in the form of gravitational waves, which are ripples in the fabric of spacetime. This was a historic breakthrough, as: These waves were predicted by Albert Einstein in his General Theory of Relativity (1915) but remained undetected for a century. In 2015, scientists first detected gravitational waves using LIGO (Laser Interferometer Gravitational-Wave Observatory) from a black hole merger. The recent observation, involving the most massive black holes ever detected via gravitational waves (one ~140 times the Sun's mass), provided new confirmation of these waves and deepened our understanding of black hole formation and the universe's extreme events.

36. C Rakesh Sharma was the first Indian to go to space (in 1984), aboard a Soviet Soyuz mission. In contrast, Shubhanshu Shukla became the first Indian to visit the ISS via an international private mission (Axiom-4, launched by SpaceX).

37. C Experiments conducted included: Seed sprouting of methi and moong, Myogenesis (muscle development in microgravity), Study of Indian strain of tardigrades. Genome sequencing was not mentioned as part of this mission's experiments.

38. C The Axiom-4 crew included: India's first astronaut to the ISS (Shukla), Poland's first ISS astronaut, and Hungary's first ISS astronaut. This marked historic firsts for all three countries.

39. B The launch was from Kennedy Space Center (1 – correct), The rocket used was SpaceX's Falcon 9, not ISRO's GSLV (2 – incorrect), The mission is viewed as a stepping stone toward India's Gaganyaan mission (3 – correct), There's no mention that the capsule "Grace" was reused (4 – not confirmed).

40. B The Axiom-4 mission was a private international mission organized by Axiom Space, with the crew launched aboard SpaceX's Crew Dragon capsule "Grace." While NASA provided ISS docking facilities, Axiom and SpaceX led the mission logistics.