ENGLISH LANGUAGE & LOGICAL REASONING

PASSAGE - I

(Verbatim text formatted for readability — The Indian Express, 6 May 2025 — Dilip Sinha)

PAKISTAN DEFENDS THE Indus Waters Treaty (IWT) ferociously, and for good reason. It had exploited its alliance with the US to the hilt to get India to sign it. In international circles, the treaty is cited as an outstanding example of river water sharing because of its scale and the hostility between the signatories. But the IWT was not about sharing river waters — it was about partitioning the rivers of northwestern India, giving Pakistan near-full rights to the waters of the three rivers in Jammu and Kashmir.

The IWT claimed "to attain the most…satisfactory utilisation of the waters of the Indus system" and provided for data exchange, cooperation and a bilateral Permanent Indus Commission for resolution of issues. But Pakistan was not interested in cooperation. What mattered to it was preventing India from exercising its limited rights to the J&K rivers. Broadly, the treaty gave India full access to the waters on the "eastern" rivers — Ravi, Beas and Sutlej. The waters of the "western" rivers — Indus, Jhelum and Chenab — were given to Pakistan, but India was allowed some use for agriculture, and run-of-river dams for hydroelectricity with limited storage. On the face of it, this seemed an equitable distribution. But the three western rivers had 80 per cent of the water — despite the fact that 39 per cent of the Indus Basin is in India, Pakistan has 47 per cent. The remainder of the Indus Basin is with China (Tibet) and Afghanistan, which are not parties to the IWT.

The treaty gave Pakistan the right to inspect any construction by India on the rivers in J&K and invoke one of the two dispute settlement processes — a Neutral Expert or a Court of Arbitration. The World Bank became the treaty's custodian with the power to appoint adjudicators. India also agreed to pay 62 million pounds to Pakistan for building link canals to switch from the eastern to the western rivers. An amusing provision was that the people authorised to nominate the arbitrators included the president of MIT and the rector of London's Imperial College of Science and Technology.

The World Bank, which had started work on the treaty in 1952, succeeded when it got the US, UK, Canada, West Germany, Australia and New Zealand to underwrite a development fund of $1 billion for the construction of dams and irrigation networks in both countries. Pakistan got an additional $315 million. The Bank funded dams in both countries. When the IWT was signed, the process of codifying international law on the issue had not started. The international customary law, such as it was at the time, was disputed — upper riparians claimed sovereign rights over their waters and lower riparians demanded unimpeded flow.

The codification of the law on sharing river waters was set in motion by the UN General Assembly in 1970 when it tasked the International Law Commission to draft one on the non-navigational uses of international watercourses. Progress was slow. An initial draft had declared rivers as a "shared natural resource". This was opposed by many countries and it eventually settled on a less ambitious formulation calling on countries to develop and share their rivers in "an equitable and reasonable manner". The ILC completed its task in 1994 and the UNGA adopted the watercourses convention in 1997, with 103 countries voting in favour. China, Turkey and Burundi voted against it. India abstained, as did Pakistan. The treaty came into force in 2014, but only 43 countries have ratified it so far. India, China and Pakistan are not among them.

Sixty-five years on, the IWT remains well ahead of the evolution of international law. Its most unreasonable provision is the absence of an exit clause or expiry date. The Columbia River Treaty between the US and Canada, signed in 1961, is also permanent, but since 2024 it has a provision allowing either country to withdraw after giving a 10-year

notice. Even the Vienna Convention on the Law of Treaties provides for the termination of a treaty if there are fundamental changes in circumstances.

It is difficult to find any other example of an upper riparian giving the kind of rights India has. Pakistan's friend, Turkey, refuses to enter into an agreement with Syria and Iraq, the lower riparians of the Tigris and Euphrates rivers. China too has no agreements with downstream countries in South and Southeast Asia on sharing the waters of Tibet's rivers. Despite getting a good deal, Pakistan's approach to the IWT has been anything but cooperative. It has raised objections to every project conceived by India in J&K. In the 1970s, it disputed the Salal Hydroelectric Project on the Chenab. India was unwilling to invoke the dispute settlement mechanism and, in 1978, accepted Pakistan's design changes. The dam was completed but its efficiency got impaired due to siltation. India started the Tulbul Navigation Project in 1984 but it remains incomplete due to Pakistan's objections. When work started on the Baglihar project in 1999, India refused to remove the gated spillway, essential for desilting, and let Pakistan take it to a Neutral Expert in 2005. Raymond Lafitte, the Swiss Neutral Expert, upheld the spillway but allowed some minor design changes. The response in Pakistan was hostile, and there were calls for abrogating the treaty.

When the Kishanganga project started, Pakistan asked for a Court of Arbitration, which upheld the project with some design changes. Pakistan then raised questions about the design of the Kishanganga and Ratle hydel projects and the World Bank appointed a Neutral Expert. Pakistan also asked for a Court of Arbitration. The Bank initially resisted the idea since it could lead to contradictory decisions, but it eventually gave in. India, however, refused to participate in the arbitration proceedings and insisted that the Permanent Indus Commission should meet to modify the treaty to address the anomalies. In the absence of a positive response from Pakistan, the Commission has not met since May 2022.

India has now declared that it will keep the treaty in abeyance. This only gives temporary relief. It will have to remove any construction it does in this period when the treaty is reactivated if found to be in violation. The real issue is the fairly high share of the water to Pakistan, which can only be corrected by a full-scale revision of the treaty. Pakistan's reaction will be equally hostile to both steps. India may as well strengthen its hand by abrogating the treaty.

Great — I'll reproduce the passage (formatting only: line breaks and paragraphing for readability; **no changes to wording**) and then give **10 very difficult questions** (5 English, 5 Logical). Each question is immediately followed by the **correct answer** and a **full explanation** that rebuts the other options. All answers are chosen strictly on textual logic — no forced answer-distribution.

1. Which one of the following best expresses the author's primary thesis in the passage?

A. The Indus Waters Treaty (IWT) is an exemplary model of cooperative river-sharing and should be preserved unchanged.
B. Pakistan has been a model partner under the IWT, and India's complaints are unwarranted.
C. The IWT unfairly grants Pakistan overwhelming rights over Indus waters; India's suspension is only a temporary measure and only full revision or abrogation would address the imbalance.
D. The IWT's only defect is minor procedural ambiguity; India should wait for global law to evolve.

2. The author cites the absence of an exit clause in the IWT primarily to show that:

A. The drafters intentionally made the IWT temporary but forgot to include implementation measures.
B. The treaty's permanence leaves India without a legal mechanism to withdraw, unlike some other water treaties.
C. The Vienna Convention on the Law of Treaties is irrelevant to river water agreements.
D. The Columbia River Treaty is identical in nature and therefore equally problematic.

3. When the author says "Pakistan was not interested in cooperation. What mattered to it was preventing India from exercising its limited rights to the J&K rivers," he most likely means that:

A. Pakistan used the treaty framework to block projects that India could lawfully pursue within the treaty's narrow allowances.
B. Pakistan provided technical and financial assistance to India to build joint projects.
C. The Indus Waters Treaty gave India unrestricted rights over all rivers in the basin.
D. Pakistan waived its dispute resolution rights to streamline project implementation.

4. Which statement best captures the author's attitude toward international institutions (e.g., World Bank, UN) as they relate to river law as discussed in the passage?

A. They have always supported equitable solutions for India and Pakistan, leaving no role for bilateral negotiation.
B. They were instrumental in framing the IWT but global legal codification lagged behind the treaty's terms.
C. They actively discouraged the IWT and refused to underwrite its implementation.
D. They sided with India in all dispute settlement processes under the IWT.

5. Which of the following is the most reasonable inference from the passage?

A. If India abrogates the IWT, Pakistan will welcome the decision and bilateral water cooperation will improve.
B. The disputes over Salal, Baglihar, Kishanganga, and Ratle demonstrate that the treaty's dispute mechanisms have sometimes led to outcomes unfavourable to India.
C. The World Bank's involvement ensured technical perfection in the treaty, avoiding all future disputes.
D. International customary law at the time of the IWT universally supported lower-riparian claims over upstream development.

6. The author's recommendation that India "may as well strengthen its hand by abrogating the treaty" relies on which unstated assumption?

A. That abrogation would leave India legally free to utilise the waters without future constraints.

B. That Pakistan will cooperate in revising the treaty if India signals willingness to abrogate.

C. That international reaction to abrogation would have no diplomatic or economic consequences for India.

D. That keeping the treaty in abeyance carries costs because India might be forced to dismantle works if the treaty is reactivated.

7. Which of the following pieces of evidence would most strengthen the author's claim that Pakistan has been obstructive under the IWT?

A. Records showing Pakistan consistently accepted India's design proposals for all projects.

B. Documents revealing repeated Pakistani objections and formal dispute submissions for multiple Indian projects.

C. Statistics indicating that both countries completed joint projects with unanimous consent.

D. Evidence that Pakistan never used the Neutral Expert or Court of Arbitration mechanisms.

8. Which flaw, if any, best describes a potential weakness in the author's argument for abrogation?

A. Failing to consider the broader geopolitical and economic costs of treaty abrogation.
B. Assuming that Pakistan will immediately agree to a renegotiation in good faith.
C. Presuming that the World Bank's funding decisions were irrelevant to the treaty's terms.
D. Overstating the success of River treaty frameworks internationally.

9. Suppose new evidence shows that India's own project designs consistently failed to meet the agreed technical standards (independent of Pakistan's objections). How would this affect the author's core argument?

A. It would weaken the argument that Pakistan's objections were unjustified and bolster the view that dispute mechanisms were necessary.
B. It would have no impact on the argument about the treaty's allocation of waters.
C. It would strengthen the call for immediate abrogation by India.
D. It would demonstrate that the World Bank should be solely responsible for revision.

10. Which analogy most closely parallels the author's reasoning about the IWT and India's options?

A. A homeowner who accepted a long lease that grants most water rights to a neighbour, then finds the neighbour blocks reasonable uses; only rescinding the lease can restore fairness.
B. A student who fails a test and blames the examiner for unfair questions without examining their study methods.
C. A company that chooses to outsource production and therefore cannot complain about supply chain issues.
D. A nation that enters trade agreements and always benefits from them without dispute.

LEGAL REASONING

The following passage and the scenarios derived from it are purely hypothetical and intended for academic purposes only. They are based on the principles and facts drawn from existing laws and proposed legislative frameworks. The factual descriptions in this passage may not reflect the actual position of law or real-world developments. While answering the questions that follow, students must confine themselves strictly to the facts and legal principles provided in the passage, without drawing upon any external knowledge or assumptions.

The Digital Personal Data Protection Act, 2023 (DPDP Act) marks a transformative moment in India's legal evolution of privacy. It is the first comprehensive data protection framework enacted after the Supreme Court, in *Justice K.S. Puttaswamy (Retd.) v. Union of India (2017)*, declared the Right to Privacy a fundamental right under Article 21. The Act seeks to strike a delicate balance between individual autonomy, technological innovation, and the legitimate interests of the State.

At its core, the DPDP Act governs the collection, storage, and use of digital personal data, whether obtained online or digitised later. It applies not only to processing within India but also to foreign entities offering goods or services in India. The law mandates that Data Fiduciaries — organisations collecting or processing personal data — must obtain *free, specific, informed, and unambiguous consent* from the Data Principal, the individual to whom the data belongs. Data may only be processed for lawful purposes, and individuals retain the right to access, correct, erase, or restrict use of their data.

The Act's architecture mirrors global frameworks such as the EU's General Data Protection Regulation (GDPR) but introduces India-specific features. The Data Protection Board of India (DPBI) functions as an adjudicatory body for enforcement, complaints, and penalties. Certain organisations, classified as Significant Data Fiduciaries (SDFs) due to the scale and sensitivity of their data operations, must appoint a Data Protection Officer, conduct impact assessments, and engage independent auditors.

However, the law's broad exemptions have sparked serious debate. Under Section 17, the Central Government may exempt any agency from compliance on grounds of sovereignty, security, or public order. Critics argue that such unbounded executive discretion could legitimise mass surveillance, undermining privacy protections. Another controversial aspect lies in Section 44(3), which amends the Right to Information (RTI) Act by removing the "larger public interest" test — allowing personal information to be withheld even when transparency serves democratic accountability.

The Draft DPDP Rules, 2025, seek to operationalise the Act through mechanisms like digital consent managers, cross-border data transfers, and graded compliance for startups and MSMEs. The Rules propose data erasure within three years of last interaction and require fiduciaries to notify individuals before deletion. Yet, the Rules also maintain the government's discretion to permit or restrict international data transfers, creating potential tension between national security and global business interests.

Supporters hail the DPDP framework as a necessary step toward modern governance and responsible innovation. Critics, however, warn that by granting wide exemptions to the State while imposing strict obligations on private actors, the Act risks creating an asymmetrical privacy regime — one where citizens' data vis-à-vis the government may remain vulnerable. The ultimate challenge before India's digital future, therefore, is not merely legal compliance but constitutional fidelity: can the country uphold individual privacy while empowering data-driven governance?

11. A government department collects citizens' biometric and location data for a "smart policing" project. It does not seek consent but claims an exemption under "public order" and "national security." Citizens challenge this, alleging violation of their privacy rights under Article 21 and the DPDP Act. The department argues that Section 17 of the Act allows exemptions to State agencies for reasons of security, sovereignty, or public order, and that it acted in good faith. The petitioners argue that "public order" cannot be a carte blanche for mass surveillance, and exemptions must be narrowly interpreted to satisfy proportionality and necessity tests laid down in *Puttaswamy*.

Which principle should the Court apply to determine the validity of such exemption claims?

A. Any State action claiming "public order" automatically overrides individual privacy.
B. The executive's discretion is final in deciding what constitutes public order under the Act.
C. The DPDP Act cannot be judicially reviewed since it is a policy law.
D. Exemptions must be narrowly construed and pass the constitutional tests of legality, necessity, and proportionality before overriding privacy rights.

12. A social media company classified as a Significant Data Fiduciary (SDF) accidentally leaked user data of 50 million Indian users. The company informed the DPBI but failed to notify affected users, claiming its systems were under audit. The DPBI imposed a penalty for failure to notify Data Principals under Section 8 obligations. The company argues that because the breach was unintentional and reported to the Board, no user notification was required. The users contend that non-notification violates their statutory right to know and seek redress.

Which interpretation best aligns with the Act's purpose and global data protection standards?

A. Only deliberate breaches require user notification; unintentional leaks are exempt.
B. Both the DPBI and affected users must be notified; transparency and accountability are integral to data protection.
C. Reporting to DPBI suffices because user notification may cause public panic.
D. Data Fiduciaries need only notify users after the Board orders disclosure.

13. A fintech app collects Aadhaar, PAN, and bank details for credit scoring. It retains this data indefinitely "for customer convenience," even after users close their accounts. When challenged, it argues that retaining data helps in preventing fraud and complies with legitimate use provisions. The users claim indefinite storage violates the data minimisation and erasure obligations under Section 9 and the draft rules.

Which principle should guide the adjudication of this dispute?

A. Data retention beyond its purpose is unlawful; fiduciaries must erase data once its purpose is fulfilled.
B. The fiduciary's commercial interest can override data minimisation obligations.
C. Consent once given permits perpetual use and storage.
D. Retention is valid unless explicitly prohibited by the DPBI.

14. A Data Principal discovers that a health insurance company has shared her medical history with a marketing firm without consent. The company claims "legitimate use" under health research exemptions and argues that anonymisation of some fields justifies disclosure. The woman files a complaint before DPBI for violation of her consent rights.

Which principle should the Board apply while deciding the case?

A. Partial anonymisation automatically legalises third-party sharing.
B. Commercial marketing is a form of research; hence, disclosure is permissible.
C. Data sharing for profit-oriented marketing cannot be justified as "legitimate use" and requires explicit consent.
D. Once anonymised, data loses protection under the DPDP Act.

15. A start-up providing AI-based education services claims an exemption from user consent requirements, citing Section 17(2) — "research and statistical purposes." It collects minors' data, including facial recognition and voice samples, arguing that anonymisation is sufficient. Parents allege violation of Section 9 (processing of children's data). The company asserts its algorithmic model constitutes "research."

Which interpretation of law is correct?

A. AI research automatically qualifies for exemption.
B. Start-ups are exempt from all consent requirements.
C. Anonymisation fully negates parental consent obligations.
D. Exemptions for research cannot override explicit prohibitions on processing children's data or parental consent requirements.

16. A Data Principal files a complaint to the DPBI against a telecom operator for retaining her KYC data after account termination. The DPBI dismisses it, citing lack of proof of "actual harm." The complainant argues that violation of statutory data erasure obligations is actionable even without material damage. The operator insists damages are necessary to establish liability.

Which of the following best reflects the principle under data protection law?

A. Only actual monetary harm gives rise to liability.
B. Breach of statutory duty itself constitutes actionable harm; material loss is not required.
C. Liability arises only if multiple users are affected.
D. DPBI can act only when criminal intent is proved.

17. A private university collects student attendance using facial recognition and stores the data on third-party cloud servers abroad. Students protest, arguing they never gave informed consent for cross-border data transfers. The university asserts that the Draft Rules allow such transfers unless the government explicitly restricts them. Students claim this violates their privacy and Section 15 obligations.

Which principle should decide the dispute?

A. Cross-border transfers are lawful unless specifically restricted; lack of explicit prohibition implies consent.
B. Consent must always be explicit and informed before international data transfer.
C. Educational institutions enjoy an implied exemption for administrative functions.
D. Storing data abroad automatically violates the DPDP Act.

18. A journalist files an RTI request for details of officials' assets, but the government denies it, citing Section 44(3) of the DPDP Act, which amends Section 8(1)(j) of the RTI Act to allow withholding of personal information. The journalist argues that such denial violates transparency principles and that public officials' financial data fall under the "larger public interest" clause. The government contends that the 2023 amendment deleted this clause.

How should this be interpreted constitutionally?

A. The amendment permanently abolishes the public interest test.
B. RTI law prevails as it is a special law promoting transparency.
C. Despite deletion, proportionality and constitutional accountability require disclosure of personal information in overriding public interest.
D. Personal data of officials can never be disclosed, irrespective of context.

19. A health-tech start-up, classified as a Significant Data Fiduciary, collects and processes genetic data for predictive diagnostics. It fails to appoint a Data Protection Officer or conduct a Data Impact Assessment. The company argues that since no data breach has occurred, compliance obligations are unnecessary. The DPBI issues a penalty notice.

Which principle applies?

A. Preventive compliance obligations apply only after a breach.
B. SDF obligations are voluntary, based on company size.
C. Compliance duties are triggered only upon user complaint.
D. Designated SDFs have proactive compliance duties, including audits and officers, irrespective of data breach occurrence.

20. A Data Principal files repeated false complaints against an e-commerce platform to harass it, claiming privacy violations. The platform produces logs proving no breach occurred. The DPBI imposes a penalty on the complainant under Section 16(2) for filing false grievances. The complainant challenges this, claiming it violates freedom of expression and grievance rights.

Which interpretation aligns with the intent of the DPDP Act?

A. False complaints, even if unintentional, must never attract penalty.
B. Penalising malicious or knowingly false complaints upholds the integrity of grievance mechanisms without curtailing genuine rights.
C. Data Principals' actions cannot attract penalties under privacy law.
D. Freedom of expression protects even malicious filings.

GENERAL KNOWLEDGE

Passage - I

In 2025, the International Solar Alliance (ISA) — the treaty-based intergovernmental organisation co-founded by India and France in 2015 — is pivoting from advocacy to operationalising a major global solar grid vision. The initiative known as One Sun One World One Grid (OSOWOG) or sometimes the Green-Grids Initiative is being advanced under the ISA umbrella, with India playing a central role.

At its 8th Assembly scheduled for 27–30 October 2025 in New Delhi, ISA will mobilise global players under themes such as catalytic finance, digitisation & global capability centres, regional country-engagement and technology-policy road-maps. India, as host and a major solar power nation, is promoting OSOWOG as an architecture for cross-border solar power exchange, from regions with surplus daylight to regions in demand.

India's domestic ambition bolsters its international leadership: by 2025 India achieved over 125 GW of solar capacity and non-fossil sources crossing 50 % of installed electricity capacity. At the ISA curtain-raiser, the Indian Minister for New & Renewable Energy declared the nation ready to share its solar experience globally and partner through ISA in deploying models such as rooftop solar, farm-solar, floating solar and green hydrogen.

The OSOWOG vision involves creating a multi-regional, eventually global, grid connecting solar-rich regions via long-distance transmission, enabling solar power to flow from daylight zones to other regions — thereby mitigating intermittency and enhancing energy security. According to ISA documents, the network could interconnect more than 140 countries and support thousands of gigawatts of capacity in coming decades.

However, the operationalisation of the global grid faces challenges: establishing cross-border institutional frameworks, aligning regulatory and market systems, financing large scale transmission infrastructure, and synchronising with national grids and storage systems. For India, the grid export/import architecture must dovetail with domestic grid expansion, storage planning and export-capable solar parks. Analysts view ISA's grid effort as a strategic dimension of India's energy diplomacy and a means to convert its solar leadership into global influence.

In short, India's participation in the ISA Global Grid/OSOWOG initiative in 2025 marks a transition from solar manufacturing & deployment leadership to networked, trans-national systems thinking. As the host of the 8th Assembly and a core driver of policy frameworks and finance mobilisation, India is positioning itself as a key node in the future global solar grid architecture, while also aligning its domestic agenda (green hydrogen, solar manufacturing, export-capable parks) with the ISA vision.

21. Which of the following statements are directly supported by the passage?

1. The ISA was co-founded by India and France in 2015.
2. The OSOWOG initiative seeks to connect over 140 countries in a global solar grid.
3. India had achieved over 200 GW of solar capacity by 2025.

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

22. Which of the following key themes for the 2025 ISA Assembly in New Delhi are mentioned in the passage?
A. Catalytic finance, global capability centres & digitisation, regional country-engagement.
B. Marine micro-grids, nuclear fusion financing & space-based solar.
C. Carbon capture and storage only.
D. None of the above

23. Which of the following operational challenges does the passage highlight for the ISA global grid vision?

1. Financing large scale long-distance transmission infrastructure.
2. Aligning regulatory and market systems across national grids.
3. Manufacturing all solar panels within ISA member countries exclusively.

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

24. Which of the following best describes India's posture with respect to ISA's 2025 agenda as given in the passage?
A. India seeks to export fossil-fuel technologies to partner countries through ISA.
B. India is ready to share its solar experience globally and partner via ISA in deploying rooftop solar, farm-solar, floating solar and green hydrogen.
C. India intends to leave the ISA and form a rival alliance.
D. India will restrict its solar cooperation only to South Asia and not globally.

25. Which of these is *not* a feature of the OSOWOG/Global Grid vision as described in the passage?
A. Transmitting solar power from daylight regions to regions in darkness.
B. Interconnecting more than 140 countries and supporting thousands of gigawatts.
C. Making solar deployment entirely independent of storage or grid infrastructure.
D. Linking the principle of energy security with cross-border solar flows.

26. Which of the following statements about India's domestic solar achievements (as context) are accurate per the passage or reasonable inference?
A. India achieved over 125 GW of solar capacity by 2025.
B. India achieved 100% solar export surplus by 2025.
C. Non-fossil sources had crossed 50% of installed electricity capacity by 2025.
D. Both A and C only

27. What role does the passage assign to the ISA initiative in global energy transition?
A. Converting commitments into concrete projects and measurable impact.
B. Allowing countries to rely solely on fossil fuels with no obligations.
C. Introducing nuclear weapons as part of energy diplomacy.
D. Delaying renewable transition until after 2040.

28. Which of the following statements about OSOWOG are true based on the passage or well-documented inference?

1. OSOWOG is an initiative under ISA to build a global solar grid architecture.
2. The initiative applies exclusively to developed countries and excludes the Global South.
3. Cross-border transmission systems are central to its concept.

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

29. Which of the following might be considered an outcome of India's leadership in ISA (inferred from the passage)?
A. India becomes a solar manufacturing and export hub and leverages ISA to expand its influence.
B. India abandons solar manufacturing and relies entirely on imports from other countries.
C. India excludes itself from regional solar cooperation initiatives.
D. India limits its solar ambition only to domestic markets and ignores global linkages.

30. Which of the following aspects is least emphasised in the passage but is likely relevant for the ISA Global Grid/OSOWOG initiative's future?

A. Deep-sea submarine transmission cables linking continents. B. Harmonised solar tariffs across member countries.
C. Capacity building and skills for solar workforce globally.
D. Financing mechanisms for mini-grids in Small Island Developing States (SIDS).

Passage - II

The Aditya-L1 mission, launched by the Indian Space Research Organisation (ISRO) on 2 September 2023 from Sriharikota aboard PSLV-C57, represents India's first dedicated solar observatory in space. By mid-January 2024, the spacecraft successfully entered a halo orbit around the Sun–Earth Lagrange Point 1 (L1), located about 1.5 million km from Earth, where the gravitational forces of the Sun and Earth balance the orbital motion of a satellite.

The key scientific aim of Aditya-L1 is to study the solar corona, solar wind, and the magnetic field dynamics driving phenomena such as solar flares and coronal mass ejections (CMEs) — critical for understanding space weather, which affects satellite operations, radio communications, and power systems on Earth. At L1, the spacecraft enjoys an uninterrupted view of the Sun, avoiding the occultation and eclipses experienced by Earth-bound observatories.

Aditya-L1 carries seven payloads, developed by ISRO and Indian academic institutions. Four of these directly observe the Sun:

- Visible Emission Line Coronagraph (VELC) — primary instrument for high-resolution coronal imaging;
- Solar Ultraviolet Imaging Telescope (SUIT) — monitors the solar photosphere and chromosphere;
- Solar Low Energy X-ray Spectrometer (SoLEXS) and High Energy L1 Orbiting X-ray Spectrometer (HEL1OS) — study solar flares across X-ray bands.

Three instruments perform *in-situ* measurements of particles and magnetic fields:

- Aditya Solar wind Particle Experiment (ASPEX);
- Plasma Analyser Package for Aditya (PAPA);
- Magnetometer.

Collectively, these will help scientists trace how solar eruptions evolve and propagate through interplanetary space.

Beyond its scientific yield, Aditya-L1 underscores India's growing capability in deep-space operations, following Chandrayaan-3's lunar success. The mission reflects a balance of cost-effectiveness and complex orbital dynamics, achieved entirely with indigenous systems and support from Indian institutions such as the Indian Institute of Astrophysics and IUCAA.

Aditya-L1 also carries strategic and societal relevance: accurate solar data can strengthen early-warning models for geomagnetic storms, improving protection of power grids and communication assets. It contributes to the global scientific community's solar datasets, complementing NASA's Parker Solar Probe and ESA's Solar Orbiter.

However, maintaining orbit stability at L1 requires precise station-keeping and fuel management; further, real-time data transmission from 1.5 million km adds latency and demands high-gain antenna reliability. Nonetheless, by achieving continuous solar monitoring from L1, India has joined a select group of spacefaring nations conducting front-line solar research.

31. Which of the following statements are correct according to the passage?

1. Aditya-L1 was launched on 2 September 2023.
2. It operates around the Sun–Earth L2 point.
3. It studies solar corona and solar wind phenomena.

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

32. The primary advantage of placing Aditya-L1 at the Lagrange Point 1 is —
A. It shields the spacecraft from solar radiation
B. It allows observation of the Moon and the Sun simultaneously.
C.. It enables uninterrupted observation of the Sun without Earth's shadow.
D. It enables direct radio relay between the Sun and the Moon.

33. Which of the following instruments aboard Aditya-L1 are designed for *in-situ* measurements?

1. ASPEX
2. PAPA
3. VELC

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

34. Which of the following correctly matches the payload with its primary purpose?
A. SUIT – Measuring charged particle flux near Earth.
B. VELC – Imaging solar corona in visible spectrum.
C. SoLEXS – Monitoring high-energy cosmic rays.
D. PAPA – Observing solar ultraviolet emissions.

35. According to the passage, which statement about Aditya-L1's scientific relevance is correct?
A. It will aid in predicting geomagnetic storms affecting communication and power grids.
B. It focuses exclusively on lunar surface imaging.
C. It will test interstellar plasma behaviour.
D. It is unrelated to space weather research.

36. Which of the following statements correctly identifies a *comparative global mission* mentioned in the passage?
A. Roscosmos' Luna 25 is the comparable mission.
B. NASA's Parker Solar Probe and ESA's Solar Orbiter are comparable missions.
C. JAXA's Akatsuki Venus Orbiter is the comparable mission.
D. NASA's James Webb Space Telescope is the comparable mission.

37. Which of the following challenges is *most likely* faced by the Aditya-L1 mission (inferred)?
A. Cryogenic fuel boil-off in lunar orbit.
B. Fuel optimisation for station-keeping at L1.
C. Loss of signal due to Martian dust storms.
D. Re-entry heating on return to Earth.

38. Which of the following institutions contributed to the Aditya-L1 payload development?
A. Indian Institute of Astrophysics and IUCAA.
B. ISI Kolkata and NITI Aayog.
C. Indian Navy Research Wing and NAL.
D. Only ISRO Telemetry Centre, Bangalore.

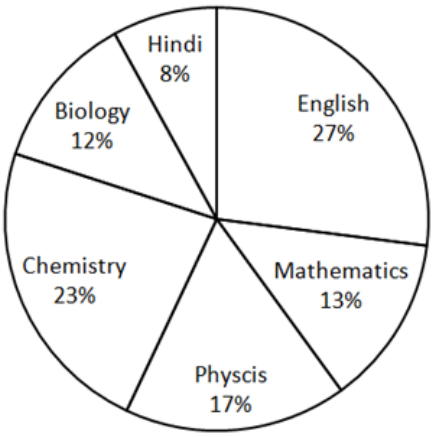
39. What distinguishes Aditya-L1's orbit from a standard geostationary orbit?
A. It is located at the Sun–Earth L1 point, about 1.5 million km away, not above Earth's equator.
B. It remains fixed above the Indian Ocean at 36,000 km altitude.
C. It revolves around the Moon synchronised with Earth's rotation.
D. It shares orbit with communication satellites.

40. Which of the following best summarises India's strategic objective behind Aditya-L1?
A. To establish capability in continuous solar observation and contribute to global space-weather research.
B. To explore asteroids between Mars and Jupiter.
C. To map the dark side of the Moon.
D. To test human-rated life-support systems.

QUANTITATIVE TECHNIQUE

Passage-I

Direction (41-45)
Pie chart shows percent wise distribution of teachers who teach six different subjects



Total number of Teacher = 1800

41. If 2/9th of the teachers who teach physics are female, then find out the number of male teachers who teach physics?
(A) 122 (B) 337 (C)235 (D) 238

42. What is the total numbers of teachers in chemistry, English and biology?
(A) 1226 (B) 1116 (C) 1176 (D) 998

43. What is the difference between the total numbers of teachers who teach English and physics together and the total number of teachers who teach mathematics and biology together?
(A) 342 (B) 252 (C)643 (D) 653

44. What is the respective ratio of the numbers of teachers who teach mathematics and the numbers of teachers who teach Hindi?
(A) 13:8 (B) 4:5 (C)5:8 (D) 8:13

45. if the numbers of Hindi teachers is increased by 25 %, then what will be the total number of Hindi teachers?
(A) 210 (B) 140 (C) 175 (D) 180

Passage - II

A group of 82 students were surveyed, and it was found that each of the students surveyed liked at least one of the following three fruits; Apple, Black mulberry and Coconut. 39 liked Apple, 50 liked Black mulberry and 39 liked Coconut.21 liked Apple and Black mulberry, 18 liked Black mulberry and Coconut, 19 like apple and Coconut. 22 liked exactly two of the following fruits apple, Black mulberry and Coconut.

46. How many Student liked all the three Fuits.
(A) 12 (B) 6 (C) 5 (D) 10

47. The number of student who like only apple is what % to the number of student who like exactly one type of fruits. (Approx)
(A) 23% (B) 29 % (C) 34 % (D) 14%

48. Find the ratio of the number of student who like at least one type of fruits to the number of student who like at least two type of fruits.
(A) 3: 4 (B) 41:17 (C) 52: 61 (D) 11: 12

49. Find the number of Student who like apple and Coconut but not like Black mulberry.
(A) 7 (B) 8 (C) 6 (D) 12

50. How many Student like either Black mulberry, coconut or both the fruits.
(A) 45 (B) 81 (C) 71 (D) NOT