

MANTHAN

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1. Nepal's Objection to Lipulekh Pass and the Kalapani Dispute



- Nepal's recent objection to the reopening of the Lipulekh Pass for border trade between India and China underscores a longstanding territorial dispute centered on Kalapani, Lipulekh, and Limpiyadhura.
- This issue, which has been simmering for decades, gained fresh attention in 2020 and continues to strain Nepal-India relations.

Lipulekh Pass Controversy

- In early 2020, Nepal strongly objected to India's construction of a road to the Lipulekh Pass, a border area between India and China.
- This route, which would facilitate border trade and pilgrimages, is located in the disputed region of Kalapani.
- India inaugurated the road to Lipulekh in May 2020, claiming that it was strategically vital for national security and religious purposes, as it also serves as a route for Kailash Mansarovar pilgrims.
- India's Ministry of External Affairs dismissed Nepal's objection, emphasizing that the area had been part of Indian territory for decades.

- The Indian response highlighted the historical significance of the region, with border trade between India and China via Lipulekh having been ongoing since 1954.
- However, Nepal continues to assert that the area is part of its territory, referring to the official map of Nepal, which includes Kalapani, Lipulekh, and Limpiyadhura as integral parts of its far-western region.

The Kalapani Dispute

- The crux of the dispute revolves around the source of the Kali River, which serves as a natural boundary between India and Nepal.
- Both countries claim Kalapani, which lies at the trijunction between Nepal, India, and China, based on different interpretations of the river's origin.

Nepal's Claim

- Nepal asserts that the Kali River originates from Limpiyadhura, located to the northwest of Lipulekh.
- According to Nepal's viewpoint, Kalapani, Lipulekh, and Limpiyadhura fall east of the Kali River and thus belong to Nepal's Far West province in the Dharchula district.
- Nepal's position is grounded in the historical Sugauli Treaty of 1816, which established the Kali River as the boundary between Nepal and British India.

India's Claim

- India, however, maintains that the Kali River originates from a stream located below Lipulekh Pass, in the Pithoragarh district of Uttarakhand. Indian records, dating back to the 19th century, show that Kalapani has long been considered part of India.
- India's position is bolstered by maps from the British colonial era that show the area as part of India.

Nepal's Repeated Objections

- Nepal's objections to the construction of the road to Lipulekh were not sudden.
- In fact, the issue had been raised several times in the past, with Nepal protesting against India's inclusion of Kalapani in its political map.
- In November 2019, India released a new political map after the reorganization of Jammu and Kashmir.
- The map showed Kalapani as part of Uttarakhand, prompting a strong protest from Nepal. Kathmandu accused India of encroaching upon its territory.
- Nepal had previously raised concerns in 2020 when India unveiled plans for infrastructure development in the region, especially the construction of the road leading to Lipulekh Pass.

The Sugauli Treaty and Boundary Delimitation

- The territorial dispute dates back to the Sugauli Treaty of 1816, signed between the British East India Company and the Kingdom of Nepal.
- The treaty established the Kali River as the boundary between Nepal and British India.
- However, the exact source of the Kali River was not clearly delineated in the treaty, leaving room for conflicting interpretations of the border.
- The issue became even more contentious when the two countries attempted to resolve the border dispute in the late 20th century.
- In the 1980s, Nepal and India set up a Joint Technical Level Boundary Working Group to address the issue, but the boundary was never fully demarcated.
- The disputed areas of Kalapani, Lipulekh, and Susta remain unresolved, despite several rounds of negotiations.

2020: The Year of Escalated Tensions

- The inauguration of the Lipulekh road by India in May 2020 intensified tensions between Nepal and India.
- The Indian road, which connects to the strategic Lipulekh Pass, serves as a vital link for both trade and pilgrimage.
- It facilitates easier access for pilgrims heading to Kailash Mansarovar, a sacred site for Hindus and Buddhists.
- The road also holds strategic significance for India, providing better access to its northern border and improving connectivity in the region.
- Despite Nepal's objections, India maintains that the road is within its territory and that the area has been part of India since British colonial rule.
- India further argued that the road had been constructed for the benefit of the local population and to enhance border security.

The China Factor: Strategic Considerations

- The dispute over Kalapani and Lipulekh is not just about territorial claims—it also involves strategic calculations, particularly regarding China.
- Both India and Nepal have had to navigate their relations with China in the context of this dispute.
- In 2016, during Prime Minister Narendra Modi's visit to Beijing, India and China agreed to enhance border trade at the Lipulekh Pass.
- This trade route had been established long before, but the 2016 agreement sought to streamline and increase trade between the two countries.
- Nepal, however, was unhappy about this arrangement, seeing it as a sign of India's increasing ties with China in the region.
- Some observers have even suggested that Nepal's protests over the road construction could be influenced by China, given the growing Sino-Nepalese ties.
- In 2020, Nepal's Prime Minister K P Sharma Oli, known for his pro-China stance, raised the issue of Kalapani and Lipulekh, leading some to speculate that Nepal was acting as a proxy for Chinese interests in the region.

Nepal-India Relations: A Complex History

- The Lipulekh road controversy is just one chapter in the broader context of Nepal-India relations, which have been fraught with tension at various points in history.
- Despite the open border and cultural ties, Nepal has at times been wary of India's influence in its domestic affairs.
- One of the key turning points in Nepal-India relations came during the 2015-2016 Madhesi protests in Nepal, which saw a blockade of supplies to Nepal, largely attributed to Indian actions.
- Nepal perceived this as interference in its internal matters, further straining the relationship.
- Since then, Nepal has gradually sought to bolster its ties with China, particularly in terms of infrastructure projects and trade agreements.
- In the case of the Kalapani dispute, Nepal has been consistent in asserting its territorial claims, although its protests were muted during the construction of the Lipulekh road.
- India, for its part, has emphasized the importance of resolving the issue through diplomatic channels, but the continued diplomatic impasse reflects deeper tensions in bilateral relations.

Kalapani Dispute between India and Nepal



- The strategic significance of Kalapani, Lipulekh, and the surrounding areas cannot be overstated.
- Kalapani, with its high-altitude location, offers a vantage point for monitoring activities along the India-China border, particularly given the region's proximity to Tibet.
- For India, control over Kalapani is vital for national security, as it serves as an observation post and a buffer against potential incursions by China.
- The road through Lipulekh not only facilitates trade between India and China but also holds religious significance for millions of Hindus and Buddhists who make the pilgrimage to Kailash Mansarovar.
- India's decision to build a road to Lipulekh was seen as a move to strengthen its strategic position and improve connectivity in the region.

QUESTIONS

1. The territorial dispute between India and Nepal over Kalapani, Lipulekh, and Limpiyadhura primarily arises due to:
 - A. Differing interpretations of the Sugauli Treaty of 1816
 - B. Ambiguities in the Shimla Agreement of 1914
 - C. The McMahon Line's undefined segments
 - D. Nepal's accession to the United Nations

2. Which of the following best describes the **strategic importance of Kalapani** for India?
- It provides access to the Arabian Sea trade routes.
 - It serves as a vantage point for monitoring the India-China border.
 - It facilitates hydropower projects for Uttarakhand.
 - It is the shortest land route to Bangladesh.
3. Consider the following statements regarding **Lipulekh Pass**:
- It connects India and China, facilitating border trade.
 - It is one of the routes for the Kailash Mansarovar pilgrimage.
 - It lies on the trijunction of India, Nepal, and Bhutan.
- Which of the above statements is/are correct?
- 1 and 2 only
 - 2 and 3 only
 - 1 and 3 only
 - 1, 2 and 3
4. Nepal claims Kalapani, Lipulekh, and Limpiyadhura as its own territory based on its interpretation that:
- The Kali River originates from Limpiyadhura.
 - The Kali River originates from a stream below Lipulekh.
 - British colonial maps always included the region in Nepal.
 - The Shimla Convention explicitly awarded the area to Nepal.
5. With reference to the India–Nepal boundary dispute, consider the following:
- The Joint Technical Level Boundary Working Group was set up in the 1980s to resolve boundary disputes.
 - The disputed areas include Kalapani, Lipulekh, and Susta.
 - The India–Nepal border is fully demarcated without any pending disputes.

Which of the above statements is/are correct?

- 1 and 2 only
- 2 only
- 1 and 3 only
- 1, 2 and 3

2. INS Udaygiri and INS Himgiri, now commissioned into the Indian Navy

- In a historic first for the Indian Navy, two advanced stealth frigates—INS Udaygiri and INS Himgiri—were commissioned simultaneously at Visakhapatnam.
- The dual commissioning marked a significant milestone in India's indigenous shipbuilding journey, with the ships constructed by two different Indian shipyards.



Two Shipyards, One Milestone

- INS Udaygiri, the second ship of the Project 17A class, was built by Mazagon Dock Shipbuilders Limited (MDL) in Mumbai.
- INS Himgiri was the first of the Project 17A class built by Garden Reach Shipbuilders and Engineers (GRSE) in Kolkata.
- This is the first instance of two major surface combatants, from different Indian shipyards, being commissioned together.
- Additionally, INS Udaygiri holds special significance as it is the 100th warship designed by the Indian Navy's in-house Warship Design Bureau (WDB).

A Boost to Indigenous Industry and Employment

- The two ships represent the collective effort of over 200 Micro, Small, and Medium Enterprises (MSMEs).
- The Ministry of Defence noted that the construction supported:
 - 4,000 direct jobs
 - 10,000+ indirect jobs
- This achievement showcases the Navy's commitment to self-reliance (Aatmanirbharta) in warship design and production.

Project 17A: The Nilgiri-Class Frigates

- The newly inducted frigates are part of the Nilgiri-class, under the broader Project 17A, which is a successor to the Shivalik-class (Project 17).
- These multi-mission frigates are designed for operations in deep-sea or "blue-water environments", capable of responding to both traditional and non-traditional threats.

Fleet Composition

- **Total Ships:** 7 frigates planned under Project 17A

- **MDL is building 4:** INS Nilgiri, Udaygiri, Taragiri, and Mahendragiri
- **GRSE is building 3:** INS Himgiri, Dunagiri, and Vindhyagiri
- Approximately 75% of the systems and equipment for these ships are sourced from indigenous firms, underlining the Navy's localisation goals.

Design & Construction Philosophy

- The ships are constructed using the “integrated construction” approach, which involves extensive pre-outfitting of blocks to shorten the construction timeline.
- The hull of the Project 17A frigates is 4.54% larger than the Shivalik-class but features a reduced radar cross-section, enhancing stealth.

Armament and Capabilities

- The Nilgiri-class frigates are packed with state-of-the-art weaponry and systems, making them potent in:
 - Anti-surface warfare
 - Anti-air warfare
 - Anti-submarine warfare

Key Features and Systems:

- 8 x BrahMos supersonic missiles (Surface-to-Surface)
- Long Range Surface to Air Missiles (LRSAM)



- Barak 8 anti-air missiles
- Lightweight torpedoes & Indigenous Rocket Launchers (IRL)
- 127 mm main gun & 2 × AK-630 rapid-fire guns
- Shakti Electronic Warfare Suite
- Advanced sonar & radar systems (Sonar Humsa NG, Multi-mission surveillance radar)

Physical Specifications:

- **Length:** 149 meters
- **Displacement:** ~6,670 tonnes
- **Speed:** Up to 28 knots
- **Endurance:** 5,500 NM at cruising speed
- **Crew:** Approx. 225 personnel
- **Propulsion:** Combined Diesel or Gas (CODOG) system

Legacy and Naming Significance

- Both new frigates carry forward the legacies of earlier Indian Navy vessels:

INS Udaygiri

- Named after a mountain range in Andhra Pradesh
- The original INS Udaygiri served from 1976 to 2007, participating in major operations including Op Pawan (Sri Lanka, 1987) and Op Castor (2005)
- **Current commanding officer:** Captain Vikas Sood, whose father served on the original Udaygiri
- **Motto:** “Sanyuktaha Paramojayaha” – In togetherness there is great victory
- Assigned to the Eastern Naval Command (Sunrise Fleet)

INS Himgiri

- Named after the Himalayan snow-clad peaks
- The earlier Himgiri (commissioned in 1974) played vital roles, including patrolling Bombay High in 1985 and providing relief during the 2001 Gujarat earthquake
- Motto: “Adrushyam Ajayam” – Invisible and Invincible
- Assigned to the Western Naval Command

Ongoing Naval Expansion in 2025

- 2025 has already seen a surge in indigenous naval platforms, including:
 - INS Surat (Destroyer)
 - INS Nilgiri (Frigate)
 - INS Vaghsheer (Submarine)
 - INS Arnala (ASW Craft)
 - INS Nistar (Diving Support Vessel)
- All these ships were built by MDL, reinforcing its central role in India’s defence manufacturing ecosystem.

Looking Ahead: Project 17 Bravo (P-17B)

- The Indian Navy has already initiated plans for the next generation of stealth frigates under Project 17 Bravo (P-17B).
- The Defence Acquisition Council approved the Acceptance of Necessity (AoN) for seven more frigates in September 2024.

P-17B ships will:

- Feature futuristic weapon systems
- Be built by MDL and GRSE
- Incorporate even higher levels of indigenous content

Prominent Shipyards in India

- India boasts a robust shipbuilding industry with over 640 shipyards as of mid-2025, spread across ports like Mumbai, Alang, and others

1. Cochin Shipyard Limited (CSL) — Kochi, Kerala

- The largest shipbuilding and repair facility in the country.
- Specializes in commercial vessels, offshore structures, and has built aircraft carriers; it's also home to India's biggest dry dock
- Currently discussing a major Rs 10,000 crore mega shipyard project in Tal Nadu with HD Hyundai, signaling significant expansion
- Operates several units across India, including Mumbai, Kolkata, Port Blair, and subsidiaries in Howrah and Udupi.

2. Mazagon Dock Shipbuilders Limited (MDL) — Mumbai

- Established in 1934, MDL is a premier builder of warships, submarines, offshore platforms, and commercial vessels.
- Strategic deal recently struck for a US \$52.96 million acquisition of Sri Lanka's Colombo Dockyard PLC, marking India's first international shipyard acquisition.

3. Garden Reach Shipbuilders & Engineers (GRSE) — Kolkata

- Founded in 1884, this public shipyard focuses on defence vessels, including corvettes, frigates, and Coast Guard ships, and is renowned for exporting as well

4. Hindustan Shipyard Limited (HSL) — Visakhapatnam

- Dating back to 1941 and the second-largest after CSL, HSL constructs submarines, tankers, bulk carriers, and performs ship repairs up to 80,000 DWT
- Recently delivered INS Nistar, a technologically advanced diving support vessel, and its Visakhapatnam repair unit is operating near full capacity amid soaring demand.

5. Goa Shipyard Limited (GSL) — Vasco da Gama, Goa

- A specialist in OPVs, tugs, pollution control vessels, landing crafts, and more—with over 167 vessels built
- While it can't build vessels above ~15,000 DWT, it's undergoing modernization for advanced ship classes including mine-countermeasure vessels and Talwar-class frigates

6. Leading Private Sector Yards

- **L&T Shipbuilding Ltd (Kattupalli, Chennai):** Boasts India's largest private shipyard setup—massive waterfront, modular fabrication facilities, ship-lift infrastructure
- **BDIL (Bharati Defence & Infrastructure Ltd):** Operates in Dabhol & Ratnagiri, focusing on offshore support, jack-up rigs, and patrol boats with modern fabrication and lifting capacities
- **Swan Defence & Heavy Industries (formerly Pipavav Shipyard):** First private entity licensed to build warships; involved in major naval and offshore contracts
- Other notable private players include ABG Shipyard, Shalimar Works, Timblo Drydocks, and L&T's marine division—all key contributors to commercial and specialized vessel construction.

Strategic Trends & Industry Outlook

- The Indian government is actively pursuing a vision to elevate India into the top 10 global shipbuilders by 2030, and one of the top 5 by 2047, backed by initiatives like Maritime India Vision 2030 and Amrit Kaal 2047.

- Efforts include financial assistance schemes, infrastructure upgrades, and resolving industry bottlenecks through digital transformation, automation, and advanced fabrication techniques.
- Acquisitions like MDL's stake in Colombo underscore India's ambition to expand its maritime influence regionally
- Domestic production is increasingly geared toward self-reliance, with recent events like the dual commissioning of INS Udaygiri and INS Himgiri—built by MDL (Mumbai) and GRSE (Kolkata)—highlighting the prowess of Indian shipyards in defense manufacturing.

QUESTIONS

6. Consider the following statements about **Project 17A frigates**:

1. They are successors to the Shivalik-class (Project 17).
2. Both Mazagon Dock Shipbuilders Limited (MDL) and Garden Reach Shipbuilders & Engineers (GRSE) are building them.
3. They are designed exclusively for anti-submarine warfare.

Which of the above statements is/are correct?

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

7. INS *Udaygiri* and INS *Himgiri*, commissioned in 2025, are significant because:

1. They are the first two stealth frigates commissioned together from different shipyards.
2. INS *Udaygiri* is the 100th warship designed by the Indian Navy's Warship Design Bureau (WDB).
3. Both ships were constructed by Mazagon Dock Shipbuilders Limited (MDL).

Which of the above statements is/are correct?

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

8. Which of the following pairs is/are correctly matched?

1. BrahMos – Surface-to-surface missiles
2. Barak-8 – Anti-air missiles
3. Humsa NG – Advanced sonar

Select the correct answer using the code below:

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

9. Which of the following shipyards in India is correctly matched with its specialization?

1. Cochin Shipyard Limited – Aircraft carriers and commercial vessels
2. Garden Reach Shipbuilders & Engineers – Corvettes, frigates, Coast Guard ships
3. Hindustan Shipyard Limited – Submarines, bulk carriers, ship repair up to 80,000 DWT

Select the correct answer using the code below:

A. 1 and 2 only

C. 1 and 3 only

B. 2 and 3 only

D. 1, 2 and 3

10. INS *Udaygiri* and INS *Himgiri* carry mottos that symbolize their roles. Consider the following pairs:

1. INS *Udaygiri* – “Sanyuktaha Paramojayaha” (In togetherness there is great victory)

2. INS *Himgiri* – “Adrushyam Ajayam” (Invisible and Invincible)

Which of the above is/are correct?

A. 1 only

C. Both 1 and 2

B. 2 only

D. Neither 1 nor 2

3. DRDO successfully tests home-grown air defence system

Mission Sudarshan Chakra

DRDO has successfully tested a new integrated air defence system expected to be a part of a bigger national security shield

THE SYSTEM'S 3 LAYERS

1 Quick reaction surface-to-air missiles

2 Very short-range air defence system

3 Laser-based directed energy weapon

HOW TEST WAS CONDUCTED

During the test, 3 different targets, including two high-speed fixed wing unmanned aerial vehicle targets and a multi-copter drone were simultaneously engaged and destroyed completely by the three defence layers at different ranges and altitudes

MODI'S 10-YEAR DEADLINE

In his Independence Day address, Prime Minister Modi set a 10-year deadline for developing an indigenous air defence shield integrated with offensive weapons under Mission Sudarshan Chakra to thwart aerial attacks



“This unique flight test has established the multi-layered air-defence capability of our country and is going to strengthen area defence for important facilities against enemy aerial threats.”

— RAJNATH SINGH, defence minister

- The Ministry of Defence (MoD) has announced the successful first flight-test of the Integrated Air Defence Weapon System (IADWS), developed indigenously by the Defence Research and Development Organisation (DRDO).

- Conducted off the coast of Odisha, the test demonstrated the system's ability to simultaneously neutralize three different aerial targets at varied altitudes and ranges.
- All components of the system performed flawlessly, as confirmed by data collected through the Integrated Test Range (ITR) at Chandipur.

What is IADWS?

- The Integrated Air Defence Weapon System (IADWS) is a multi-layered air defence solution designed to counter a wide spectrum of aerial threats. It includes three major indigenous components:

Quick Reaction Surface-to-Air Missile (QRSAM)

- Very Short Range Air Defence System (VSHORADS)
- Directed Energy Weapon (DEW)
- Together, these systems provide a comprehensive, short-to-medium range defensive umbrella, with full integration through a Centralised Command and Control Centre, ensuring coordinated response against enemy aerial intrusions.

Components of the IADWS

1. Quick Reaction Surface-to-Air Missile (QRSAM)

- Developed by DRDO, QRSAM is a short-range SAM system designed to protect moving armoured formations from aerial threats like aircraft, helicopters, and UAVs.



- **Operational Range:** 3 km to 30 km
- **Highly mobile:** Configured on mobile platforms for rapid deployment
- **Automated Systems:** Includes a fully automated command and control unit

- **Radar Suite:** Equipped with two radars — Active Array Battery Surveillance Radar and Active Array Battery Multifunction Radar
 - Both offer 360-degree coverage
 - Search-on-move and track-on-move capabilities
- **Firing on short halts:** Provides protection without requiring a long setup time
- QRSAM is the backbone of the IADWS's medium-range defence capability.

2. Very Short Range Air Defence System (VSHORADS)

- The VSHORADS is a fourth-generation man-portable air defence system (MANPAD), developed by the Research Centre Imarat (RCI).
- It provides a last-line-of-defence capability and is deployable across the Army, Navy, and Air Force.
 - **Operational Range:** 300 meters to 6 kilometers
 - **Targets:** Effective against drones, fixed-wing aircraft, helicopters, and other low-altitude aerial threats
 - **Advanced Miniaturisation:** Lightweight and portable, suitable for rapid deployment and infantry-level operations
- This system significantly improves India's tactical air defence, especially in high-altitude and mobile warfare scenarios.

3. Directed Energy Weapon (DEW)

- The Directed Energy Weapon, developed by CHES (Centre for High Energy Systems and Sciences), is a laser-based system capable of neutralizing unmanned aerial vehicles (UAVs), especially swarm drones. Key features include:
 - **Range:** Less than 3 km
 - **Target Capabilities:** Fixed-wing UAVs and swarming drones
 - **Effect:** Causes structural damage and disables onboard surveillance systems
 - **Recent Success:** In April, the DEW MK-II(A) land version was successfully tested in a field environment
- With this system, India joins a select group of global powers that possess operational laser weapon technology.

Command and Control Integration

- All three components — QRSAM, VSHORADS, and DEW — are integrated via a centralized Command and Control Centre, developed by the Defence Research and Development Laboratory (DRDL), Hyderabad.
- This system enables: Seamless coordination between missile and energy-based systems
 - Real-time threat assessment
 - Automated targeting and engagement
 - Simultaneous engagement of multiple threats
- The integration allows India to deploy a networked, layered air defence system against various aerial intrusions, from fast jets to slow-moving drones.

Strategic Significance of IADWS

- The successful test of IADWS is being hailed as a “strategic leap” in India's indigenous defence capabilities.

- The multi-layered nature of the system allows it to counter a broad spectrum of threats across multiple ranges, with key strategic benefits:
 - **Comprehensive Coverage:** Protects against aerial threats within a 30 km radius
 - **Multi-platform Flexibility:** Mobile, land-based solution adaptable to battlefield conditions
 - **Indigenous Development:** Reduces reliance on foreign weapon systems
 - **Enhanced Readiness:** Quick response to evolving aerial threats, including drone swarms and low-flying targets

DRDO

- DRDO stands for the Defence Research and Development Organisation, which is an agency under the Ministry of Defence, Government of India.
- It is responsible for the research and development of technologies for use by the Indian military.
 - **Full Form:** Defence Research and Development Organisation
 - Established: 1958
 - **Headquarters:** New Delhi, India
 - **Motto:** “Strength’s Origin is in Science”
 - **Parent Agency:** Ministry of Defence, Government of India

Main Functions

DRDO works in several key areas:

- | | |
|-----------------------|----------------------|
| • Aeronautics | • Missile systems |
| • Armaments | • Materials |
| • Combat vehicles | • Naval systems |
| • Electronics | • Advanced computing |
| • Instrumentation | • Simulation |
| • Engineering systems | • Life sciences |

Major Achievements

Some of DRDO’s most notable projects include:

- | | |
|--|--|
| • Agni and Prithvi missiles (ballistic missile programs) | • Rustom and TAPAS UAVs |
| • Arjun Main Battle Tank | • AEW&CS (Airborne Early Warning and Control System) |
| • Tejas Light Combat Aircraft (LCA) | • Astra (air-to-air missile) |
| • Akash and Nag missile systems | |

QUESTIONS

11. Consider the following statements about the **Quick Reaction Surface-to-Air Missile (QRSAM)**:

1. It has an operational range of up to 30 km.
2. It is designed to protect moving armoured formations from aerial threats.
3. It is equipped with two radars providing 360-degree coverage.

Which of the statements given above are correct?

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

12. With reference to the **Very Short Range Air Defence System (VSHORADS)**, consider the following:

1. It is a fourth-generation man-portable air defence system (MANPAD).
2. It has an effective operational range of less than 1 km.
3. It can target drones, fixed-wing aircraft, and helicopters at low altitudes.

Which of the statements given above is/are correct?

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

13. Consider the following pairs regarding components of Integrated Air Defence Weapon System (IADWS):

1. Directed Energy Weapon (DEW) – Neutralises UAVs and swarm drones using lasers.
2. QRSAM – Backbone of medium-range defence within IADWS.
3. VSHORADS – Provides last-line-of-defence capability in battlefield scenarios.

Which of the above pairs is/are correctly matched?

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

14. With reference to the Command and Control Integration of Integrated Air Defence Weapon System (IADWS), consider the following statements:

1. It has been developed by the Defence Research and Development Laboratory (DRDL), Hyderabad.
2. It enables seamless coordination between missile systems and energy-based systems.
3. It requires manual intervention for threat assessment and engagement.

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

15. Which of the following is/are true regarding the strategic significance of IADWS?

1. It provides multi-layered air defence coverage up to 30 km radius.
2. It is entirely dependent on imported technologies.
3. It enhances India's readiness against modern threats such as drone swarms.

Select the correct answer using the code below:

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

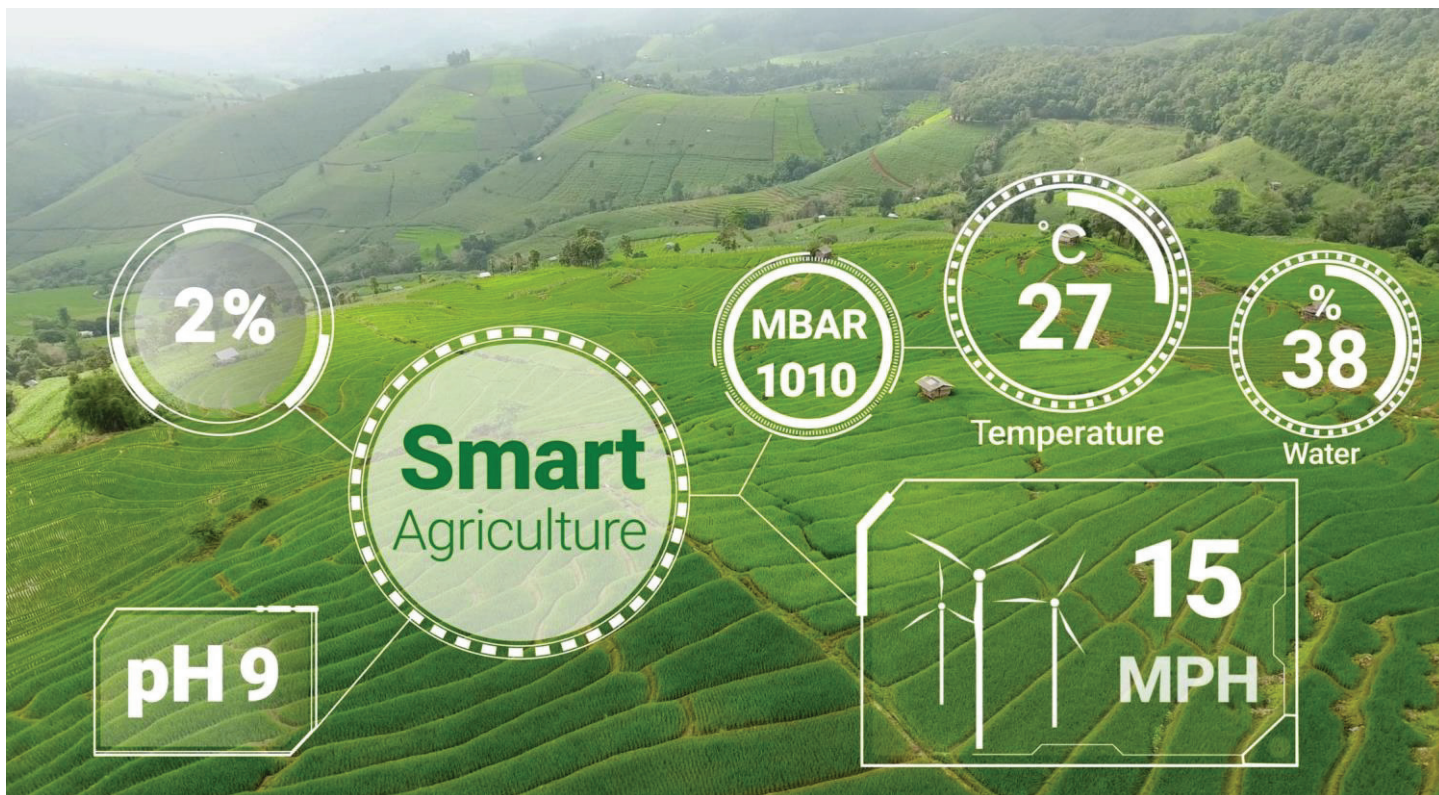
4. India's first Smart and Intelligent Village in Satnavari



- Maharashtra has embarked on a transformative rural development journey with the launch of India's first Smart and Intelligent Village in Satnavari, located 31 km from Nagpur city.
- The initiative, championed by Chief Minister Devendra Fadnavis, represents a new vision for rural India — one that combines digital innovation, sustainability, and community empowerment.
- The concept was initiated by Voice of Indian Communication Technology Enterprises (VoICE), a telecom industry consortium that presented the model to the CM on June 19.
- The ultimate goal is to replicate this model across 3,500 villages in Maharashtra, with 10 Smart Villages in each taluka.

What is a Smart Intelligent Village?

- A Smart Intelligent Village is a rural settlement enhanced by advanced digital technologies like:
 - Artificial Intelligence (AI)
 - Internet of Things (IoT)
 - Cloud computing



Remote connectivity and automation

- It focuses on optimizing services such as agriculture, healthcare, education, water management, security, and waste disposal, enhancing both quality of life and economic productivity.
- According to VoICE Director General Rakesh Kumar Bhatnagar, the vision is to create tech-enabled rural ecosystems where technology seamlessly integrates into everyday life, supporting farming, health, learning, and environmental sustainability.

Why Satnavari Was Chosen

- Satnavari was selected based on its suitability for multiple interventions, including:
 - Presence of farmland, ponds, schools, and anganwadis
 - Active Gram Panchayat and community participation
 - Access to basic infrastructure for tech deployment
- Its geographical diversity and community readiness made it an ideal testbed for deploying a comprehensive range of smart solutions.

Key Smart Interventions in Satnavari

1. Smart Agriculture

- IoT sensors monitor soil moisture, pH, and temperature in real time.
- AI-based tools help detect pests early, saving crops and reducing pesticide use.
- **Farmers achieve:**
 - 25-40% water savings
 - 30% less fertilizer use
 - Up to 25% increase in yield
- A mobile app guides climate-resilient and natural farming practices using verified data.

2. Precision Farming with Drones

- Drones perform soil mapping, targeted pesticide spraying, and pest imaging.
- **Results include:**
 - 50% less pesticide usage
 - 20-30% lower chemical footprint
 - 80% reduction in manual labor
- Youth are being trained to operate drones, creating employment and entrepreneurship opportunities.

3. Smart Fisheries

- Water quality sensors monitor oxygen, pH, and temperature levels.
- Alerts help farmers act quickly, reducing fish mortality and boosting yield by 20-30%.

4. Drinking Water Monitoring

- An AI-driven system ensures:
 - Continuous monitoring of drinking water supply
 - Delivery of 55 litres per person per day
 - Real-time detection of contamination or supply faults

5. Healthcare Transformation

- Smart health stations offer 120+ medical tests on the spot, including:
 - Blood pressure
 - Diabetes
 - Cancer screening
 - TB detection
- Telemedicine services connect villagers to urban hospitals.
- ASHA workers are empowered with real-time diagnostic tools, speeding up treatment and follow-up.

6. Education & Digital Classrooms

- AI-enabled classrooms equipped with projectors, apps, and Wi-Fi
- Online classes held via Zoom, supported by BharatNet providing up to 100 Mbps speeds
- Digital content, e-learning platforms, and interactive lessons foster modern learning environments

7. Village Safety and Surveillance

- Smart streetlights use motion and ambient light sensors, reducing power use by 50-70%
- CCTV cameras and surveillance drones track public spaces and fields
- AI tools detect intrusions or crop damage in real time

8. Waste Management

- IoT-enabled bins notify sanitation workers for timely collection
- Toxic element tracking prevents pollution from mercury, lead, or cadmium
- Data analytics helps plan better waste strategies

9. Emergency and Fire Response

- Fire extinguishers shaped like UL-approved safety balls installed in schools and public areas
- Drones can carry these extinguishers and drop them on fire outbreaks in remote fields
- A public safety system includes:
 - Emergency buttons in Panchayat offices
 - Push-to-talk devices with GPS for local security staff
 - Integrated communication with police, NDRF, and SDRF

10. Central Network Management Control (C-NOC)

- A centralized monitoring unit tracks:
 - Device performance
 - System outages
 - Data uptime
- Vendors receive real-time alerts for maintenance, ensuring maximum service continuity.

Implementation and Cost

- The pilot project in Satnavari cost approximately ₹50 lakh
- It was implemented by 24 VoICE consortium companies, most of them startups and SMEs
- These companies funded the pilot to demonstrate scalability and potentially bid in future tenders
- The Nagpur Zilla Parishad coordinated with local officials and villagers to execute the project

Scaling the Model Across Maharashtra

- Chief Minister Fadnavis announced plans to:
 - Replicate the model in 10 villages per taluka
 - Cover 3,500+ villages across the state
- According to VoICE, once permissions are in place, the model can be implemented in under 10 days per village.

Challenges and Roadblocks

1. Internet Connectivity

- Only about 3,750 Gram Panchayats currently have reliable internet
- Many depend on public networks, often facing low speeds and poor maintenance of optical fibre cables

2. Long-Term Sustainability

- The pilot had no cost to the government, raising concerns about:
 - Funding for future rollouts
 - Maintenance of infrastructure
 - Community ownership and participation
- Establishing self-sustaining models, involving public-private partnerships, will be essential for success.

QUESTIONS

16. With reference to the Smart Intelligent Village model in Satnavari, consider the following statements:
1. It was launched as a pilot project by the Voice of Indian Communication Technology Enterprises (VoICE).
 2. The pilot cost was approximately ₹50 lakh and involved multiple startups.
 3. The project is designed to be replicated across 3,500 villages in Maharashtra.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

17. Consider the following interventions under the **Satnavari Smart Village project**:

1. IoT-enabled sensors for soil, water, and air quality monitoring.
2. AI-based pest detection to reduce pesticide use.
3. Drone-based soil mapping and spraying for precision farming.
4. IoT-enabled waste bins to alert sanitation workers.

How many of the above interventions are actually part of the Satnavari model?

- | | |
|-------------|---------------|
| A. Only one | C. Only three |
| B. Only two | D. All four |

18. With reference to **Smart Fisheries and Drinking Water Monitoring** in Satnavari, consider the following statements:

1. Smart fisheries use water-quality sensors to track oxygen, pH, and temperature.
2. Drinking water supply ensures 55 litres per person per day using AI-driven systems.
3. Both initiatives have led to more than 50% reduction in resource usage.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

19. Consider the following features of the Satnavari Smart Village initiative:

1. Smart classrooms enabled with AI, Wi-Fi, and online Zoom sessions.
2. Smart streetlights with motion and ambient sensors reducing power use by up to 70%.
3. Fire extinguishers shaped like safety balls, deployable by drones.
4. Centralized Network Operations Centre (C-NOC) for real-time monitoring of devices.

How many of the above features are correct?

- | | |
|-------------|---------------|
| A. Only one | C. Only three |
| B. Only two | D. All four |

20. With reference to the **employment and training aspects** of the Satnavari Smart Village model, consider the following statements:

1. Farmers are trained in climate-resilient farming practices through mobile apps.
2. Local youth are being trained to operate agricultural drones.
3. ASHA workers have been equipped with real-time diagnostic tools.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

5. Jan Vishwas 2.0

- The Jan Vishwas (Amendment of Provisions) Bill, 2025 was introduced in the Lok Sabha with the primary goal of decriminalising and rationalising penalties in 16 central legislations.
- It is a continuation of the government's initiative to promote trust-based governance, reduce legal compliance burdens, and enhance the ease of living and doing business in India.
- This is the second major legislation under the "Jan Vishwas" initiative, following the Jan Vishwas (Amendment of Provisions) Act, 2023, which decriminalised 183 provisions across 42 Acts.

Rationale Behind the Bill

Overcriminalisation of Laws

- According to research by the Vidhi Centre for Legal Policy, India has:
 - 882 central laws, out of which
 - 370 laws carry criminal provisions,

Accounting for 7,305 distinct offences.

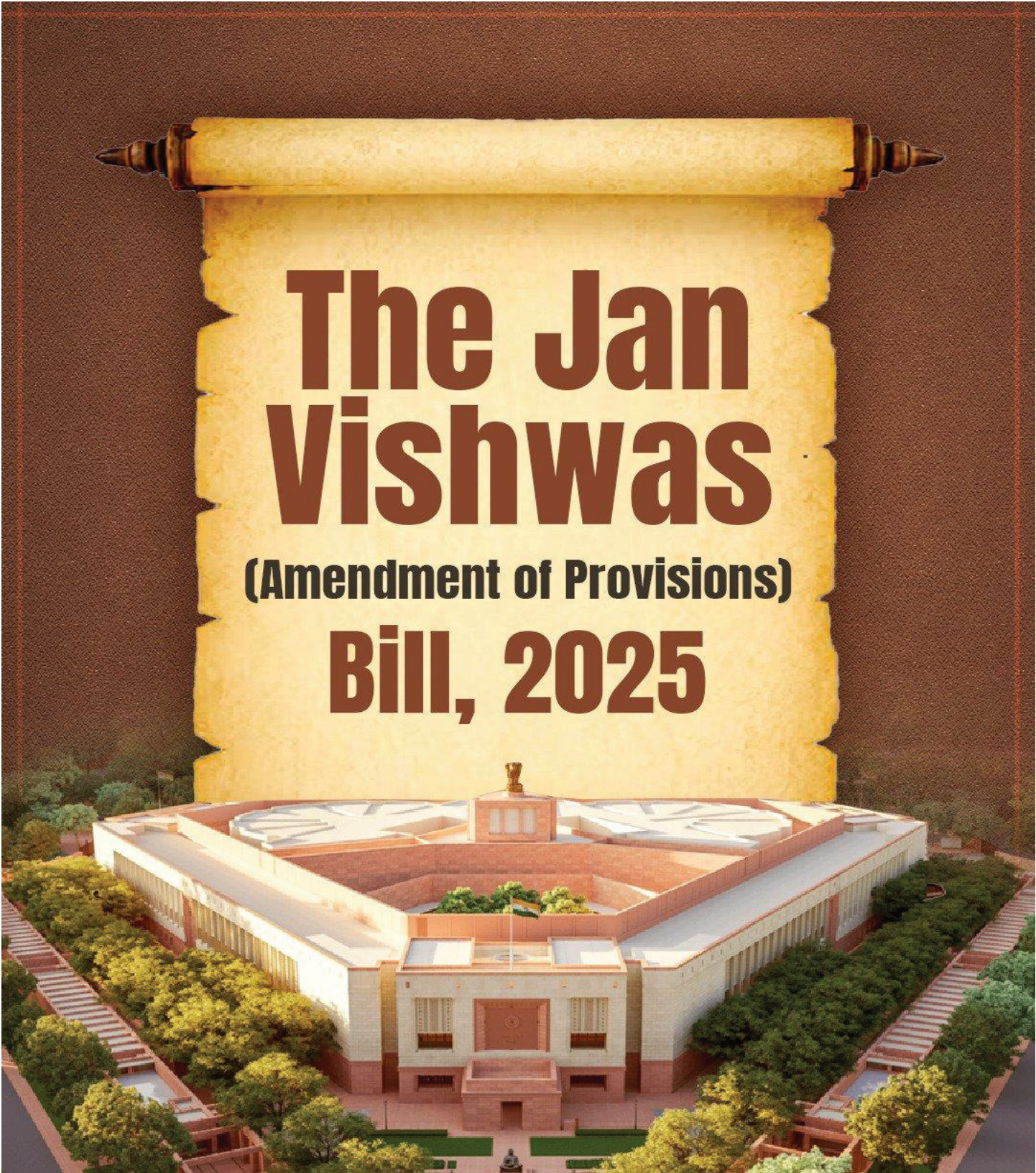
- Crucially, over 75% of these offences are non-core criminal justice in nature—relating instead to areas such as taxation, shipping, municipal governance, and finance.

Disproportionate Punishments

- Many laws impose harsh criminal penalties for minor or technical infractions. Examples include:
- Being arrested for milking a cow on the street, or
 - Facing penalties for not exercising a pet dog properly.
 - These outdated and overly paternalistic laws violate the legal principle of proportionality in punishment and open the door to arbitrary misuse of state power.

Impact on Business and Governance

- The Observer Research Foundation (2022) highlighted the severe compliance burden:
- Of 1,536 laws governing business, over 50% include imprisonment clauses.
- Of 69,233 compliances, 37.8% carry jail terms.



The Jan Vishwas

(Amendment of Provisions)

Bill, 2025

- Such criminalisation stifles:
 - Entrepreneurship
 - Job creation
 - Innovation
 - GDP growth

- It creates an intimidating legal environment, particularly for small businesses, startups, and informal sector players.

Burden on Judicial System

India's judiciary is overburdened:

- Over 3.6 crore criminal cases pending in district courts.
- 2.3 crore+ cases are over a year old.
- Minor, procedural offences clog the system and delay justice in serious criminal cases. The 2023 Commerce Ministry press release rightly stated that the criminalisation of technical lapses puts “serious offences on the back burner”.

Objectives of the 2025 Bill

The 2025 Bill expands the decriminalisation drive by:

- Amending 355 provisions,
- 288 provisions to be decriminalised, and
- 67 provisions to be amended for ease of living.
 - The Bill focuses on:
 - Promoting ease of doing business
 - Simplifying compliance mechanisms
 - Avoiding criminal sanctions for minor lapses
 - Reinforcing proportionality and rationality in penalties
 - Laws Affected by the Bill
- The 16 Acts proposed to be amended include:
 - Reserve Bank of India Act, 1934
 - Drugs and Cosmetics Act, 1940
 - Road Transport Corporation Act, 1950
 - Tea Act, 1953
 - Coir Industry Act, 1953
 - Handlooms (Reservation of Articles for Production) Act, 1985
 - Delhi Municipal Corporation Act, 1957
 - Apprentices Act, 1961
 - Motor Vehicles Act, 1988
 - New Delhi Municipal Council Act, 1994
 - Central Silk Board Act, 1948
 - Textiles Committee Act, 1963
 - APEDA Act, 1985
 - MSME Development Act, 2006
 - Legal Metrology Act, 2009
 - Electricity Act, 2003
- These span across 10 ministries/departments, ensuring broad systemic reform.

Key Features of the 2025 Bill

1. Decriminalisation of Technical and Procedural Offences

- Removes jail terms for minor and procedural violations.
- Replaces them with monetary fines, warnings, or improvement notices.

Example:

Under the Electricity Act, imprisonment of 3 months for non-compliance is replaced by a fine ranging from ₹10,000 to ₹10 lakh.

2. Introduction of Warnings and Improvement Notices

- For first-time offenders, especially under laws like the:
 - Motor Vehicles Act
 - Apprentice Act
 - Legal Metrology Act
- Authorities can issue improvement notices requiring rectification within a specific timeframe.

Example:

If a trader uses non-standard weights, they will receive a notice first. Only if they fail to comply, monetary penalties will follow.

3. Rationalisation and Gradation of Penalties

- Penalties have been streamlined to reflect the severity of offences.
- Introduces an automatic 10% increase in penalty every three years for repeat offences—creating a deterrent effect without requiring fresh legislative changes.

Government's Justification and Vision

- Commerce Minister Piyush Goyal highlighted that the bill:

“...aims to promote ease of living by eliminating unnecessary legal hurdles and simplifying the regulatory landscape.”
- This aligns with the NDA government's ongoing efforts to:
 - Modernise outdated laws
 - Foster business growth
 - Enhance citizen-state trust

Prime Minister's Statement

- In his 2025 Independence Day address, PM Narendra Modi reaffirmed the commitment to:

“...rid the country of unnecessary laws that criminalise people for very small things.”
- He emphasized that these outdated laws have gone unaddressed for decades, and reforms like Jan Vishwas are long overdue.

Parliamentary Status and Next Steps

- The Bill has been referred to a Select Committee of the Lok Sabha, which will:
 - Study the provisions in detail
 - Submit a report by the first day of the next parliamentary session
 - This step ensures consultation, scrutiny, and consensus-building before the Bill is passed into law.

Jan Vishwas 1.0

- Jan Vishwas 1.0—formally the Jan Vishwas (Amendment of Provisions) Bill, 2023—was designed to simplify laws, enhance ease of doing business and living, and reduce unnecessary criminal penalties for minor infractions.

Key Highlights:

- It aimed to decriminalize approximately 180–183 provisions across 42 central Acts spanning sectors like environment, agriculture, industry, media, and trade.
- The bill removed imprisonment clauses in several laws, replacing them with monetary fines and compounding mechanisms to make compliance more citizen-friendly.
- It also introduced mechanisms like designating Adjudicating Officers to handle penalties and periodic revision of fines, typically increasing minimum penalties by 10% every three years.

Intent & Impact:

- The primary goal was to lower barriers for businesses, especially small enterprises, by removing fear of jail for minor administrative lapses.
- It was expected to ease litigation and reduce burden on courts, allowing judicial focus to remain on serious offenses.
- The legislation was part of a broader strategy to instill trust-based governance, where regulatory penalties were more proportionate to the violation and aligned with reform rather than punishment.

Progress Since Then

- Since Jan Vishwas 1.0, the government has introduced Jan Vishwas 2.0 through the Jan Vishwas (Amendment of Provisions) Bill, 2025.
- This new version builds upon the earlier framework but introduces a major shift:
- First-time offenders now receive an “improvement notice” instead of an immediate penalty, giving them an opportunity to rectify the non-compliance.
- Penalties are triggered only from the second violation onward, starting at the same levels established under Jan Vishwas 1.0, and fines increase for repeat offenses—keeping with the expanded trust-first philosophy.
- The 2025 version includes reforms across more laws, targeting 288 provisions across 16 central Acts, with some figures mentioning up to 355 changes including both business-related and daily-life regulations.

QUESTIONS

21. With reference to the **Jan Vishwas (Amendment of Provisions) Bill, 2025**, consider the following statements:

1. It seeks to amend provisions in 16 central legislations across 10 ministries.
2. It proposes to decriminalise more than 280 provisions and rationalise penalties.
3. It replaces imprisonment clauses for technical lapses with monetary fines and improvement notices.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

22. Consider the following Acts, which are proposed to be amended under the **Jan Vishwas Bill, 2025**:

1. Reserve Bank of India Act, 1934
2. Apprentices Act, 1961
3. Electricity Act, 2003
4. Wildlife Protection Act, 1972

How many of the above Acts are covered under Jan Vishwas 2.0?

- | | |
|-------------|---------------|
| A. Only one | C. Only three |
| B. Only two | D. All four |

23. With reference to the **rationale behind the Jan Vishwas initiative**, consider the following statements:

1. More than 75% of criminal offences in central laws are related to non-core criminal justice issues.
2. Of the 1,536 laws governing business, over half include imprisonment clauses.
3. Over 35% of compliances in India carry jail terms, disproportionately burdening businesses.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

24. With reference to **Jan Vishwas 1.0 (2023) and Jan Vishwas 2.0 (2025)**, consider the following statements:

1. Jan Vishwas 1.0 decriminalised provisions in 42 central Acts, while Jan Vishwas 2.0 focuses on 16 central legislations.
2. Both Bills include an automatic 10% increase in penalties every three years.
3. Jan Vishwas 2.0 introduces first-time offender rectification through improvement notices.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

25. Consider the following features of the Jan Vishwas (Amendment of Provisions) Bill, 2025:

1. Gradation of penalties based on severity of offences.
2. Consultation process through referral to a Parliamentary Select Committee.
3. Provisions to issue warnings instead of penalties for minor first-time infractions.

How many of the above are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

6. Botswana's president declares health emergency over supply shortages



- Botswana's President Duma Boko has declared a national public health emergency following severe shortages of essential medicines and medical supplies.
- On 4 August, the Ministry of Health suspended non-urgent surgeries due to the unavailability of critical treatments for conditions like hypertension, diabetes, cancer, asthma, and eye diseases.
- Supplies such as bandages, sutures, and sexual and reproductive health items are also in short supply.

Government Response and Emergency Funding

- President Boko announced that 250 million pula (£13.8m) would be allocated for emergency medicine procurement.
- The military will oversee the distribution to ensure swift and secure delivery.
- Boko acknowledged a breakdown in the country's medical supply chain, blaming the Central Medical Stores (CMS), the state procurement agency, for failing to manage procurement effectively.
- According to Boko, the CMS had quoted 705 million pula for a year's supply of medicines, but an emergency taskforce was able to secure a quote of under 80 million pula for similar supplies.
- The president criticized inflated drug prices, which he said were marked up five to ten times, rendering the current system unsustainable.

Dysfunction and Corruption at Central Medical Stores

- Experts point to deep-rooted dysfunction at the CMS.
- Thabo Lucas Seleke, a lecturer at the University of Botswana, highlighted chronic issues including corruption allegations, incomplete procurement records, and repeated delays flagged by the auditor general in multiple reports. Reform pledges have gone unmet, compounding the procurement failures.

Economic Pressures from Diamond Market Downturn

- Botswana's public health emergency is closely tied to broader economic challenges.
- A three-year slump in global diamond prices has severely affected the country, which is the world's largest diamond producer by value.
- Diamonds accounted for 25% of GDP, 33% of government revenues, and 80% of exports in 2024. The economy shrank by an estimated 3% that year.
- Zoë McCathie, an analyst at Signal Risk, said the prolonged downturn caught both diamond mining companies and the government off guard, leading to inadequate financial preparation.
- The Ministry of Health also reported debts totaling 1 billion pula to private health providers and suppliers.

Impact of US Aid Cuts on HIV Programmes

- Botswana's celebrated HIV/AIDS response has not been immune to the crisis.
- The country, which once had some of the highest mother-to-child transmission rates, received WHO gold-tier status in 2023 for eliminating vertical transmission as a public health threat.
- This achievement was supported by both domestic antiretroviral procurement and international aid.
- However, US funding cuts announced in January 2025 have affected the country's ability to maintain its HIV response.
- Previously, the US contributed around \$67 million annually, including \$55 million from the President's Emergency Plan for AIDS Relief (PEPFAR) and \$12 million via the Global Fund. While some PEPFAR funding has been restored, it has not been fully reinstated.

Botswana

Geography

- **Location:** Southern Africa, landlocked; bordered by South Africa, Namibia, Zimbabwe, and Zambia.
- **Landscape:** Mostly flat with the Kalahari Desert covering much of the territory.

Key Features:

- **Okavango Delta:** One of the world's largest inland deltas and a UNESCO World Heritage Site.
- **Chobe National Park:** Famous for its elephants.
- **Makgadikgadi Pans:** One of the largest salt flats in the world.

History

- **Pre-Colonial Era:** Home to various Bantu-speaking tribes and the San (Bushmen).
- **Colonial Period:** Became the British protectorate of Bechuanaland in 1885.
- **Independence:** Gained in 1966 under the leadership of Sir Seretse Khama (first president).
- **Post-Independence:** Maintained political stability, democratic governance, and economic growth.

Government and Politics

- **Type:** Parliamentary republic with regular multi-party elections.
- **President (2025):** Duma Gideon Boko
- **Ruling Party:** Botswana Democratic Party (BDP).
- **Judiciary:** Independent with a well-respected legal system.

Economy

- **Major Sectors:**
 - **Mining:** World's second-largest diamond producer (after Russia).
 - **Tourism:** Strong focus on eco-tourism (Okavango, Chobe).
 - **Agriculture:** Limited due to arid climate.
 - **Currency:** Botswana Pula (stable and well-regarded).

Economic Strengths:

- Low corruption
- Sound fiscal policies
- Strong foreign reserves

Challenges:

- High HIV/AIDS prevalence
- Unemployment and income inequality
- Overdependence on diamonds

Demographics

- **Population:** ~2.6 million
- **Urbanization:** Highly urbanized; Gaborone is the largest city.
- **Ethnic Groups:** Predominantly Tswana (about 80%), Kalanga, Basarwa (San), and others.
- **Religion:** Mostly Christian, with traditional beliefs practiced alongside.

Education and Health

- **Literacy Rate:** Over 85%
- **Education:** Free and compulsory primary education
- **Universities:** University of Botswana (main public university)
- **Health Care:** Public healthcare widely available; free for citizens
- **HIV/AIDS:** One of the highest prevalence rates globally, but managed with strong public health efforts

Culture

- **Traditional Music & Dance:** Integral to Setswana culture (*e.g.*, Borankana, Setapa).
- **Dress:** Western-style clothing is common, but traditional attire worn during cultural events.
- **Cuisine:** Includes dishes like seswaa (shredded meat), bogobe (porridge), and morogo (wild greens).
- **Languages:** English (official), Setswana (national and most spoken)

Tourism & Wildlife

- Botswana is a premier destination for safari and eco-tourism:

Top Attractions:

- Okavango Delta
- Chobe National Park (largest elephant population in Africa)
- Moremi Game Reserve
- Makgadikgadi Salt Pans
- Central Kalahari Game Reserve
 - **Wildlife:** Elephants, lions, leopards, rhinos, hippos, cheetahs, and many bird species.

Okavango Delta

- The Okavango Delta is one of the most remarkable and unique ecosystems on Earth. Located in northern Botswana, it's a vast inland delta formed where the Okavango River spills into the Kalahari Desert, creating a lush, ever-changing oasis in an otherwise arid region.

About the Okavango Delta

- **Size:** Approximately 15,000 km² during the dry season, expanding to over 22,000 km² in the rainy season.
- **UNESCO World Heritage Site:** Designated in 2014 for its outstanding biodiversity and ecological importance.
- **Unique Hydrology:** Unlike most deltas, the Okavango has no outlet to the sea. Water from the Okavango River evaporates or seeps into the desert sands.
- **Flooding Cycle:** The delta floods seasonally, typically peaking between June and August, when water from Angola's rainy season arrives — during Botswana's dry season. This counterintuitive cycle supports an incredible diversity of life.

Wildlife

- The delta is a paradise for wildlife, supporting:
 - **Big Five:** Elephants, lions, leopards, buffaloes, and (sometimes) rhinos.
 - **Other animals:** Hippos, crocodiles, wild dogs, antelope (*e.g.*, lechwe, sitatunga), giraffes, zebras, and more.
 - **Birdlife:** Over 400 species — a birder's dream.

Activities in the Delta

- **Mokoro safaris:** Traditional dugout canoe rides through the channels — quiet, immersive, and unforgettable.
- **Walking safaris:** Guided bush walks that let you track wildlife on foot.
- **Game drives:** In surrounding private reserves and national parks (*e.g.*, Moremi Game Reserve).
- **Photographic safaris:** Due to exceptional scenery and animal behavior.

Conservation and Challenges

- The Okavango Delta is relatively pristine but faces threats from:
 - Upstream water use and damming (especially in Angola and Namibia)
 - Climate change
 - Tourism impacts, if not carefully managed

- Conservation efforts are active, often community-led, and the area benefits from low-volume, high-cost tourism to protect its delicate balance.

QUESTIONS

26. With reference to the **Okavango Delta**, consider the following statements:

1. It is a UNESCO World Heritage Site.
2. It is an inland delta with no outlet to the sea.
3. It is located in southern Botswana, close to the capital city Gaborone.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

27. With reference to **HIV/AIDS management in Botswana**, consider the following statements:

1. Botswana achieved WHO gold-tier status in 2023 for eliminating mother-to-child transmission as a public health threat.
2. The country's HIV response has been supported by US aid programmes like PEPFAR.
3. In 2025, US funding cuts affected Botswana's ability to sustain its HIV programmes.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

28. With reference to the **geography of Botswana**, consider the following statements:

1. It is a landlocked country in Southern Africa.
2. It shares borders with South Africa, Namibia, Zimbabwe, and Zambia.
3. The Makgadikgadi Pans in Botswana are among the largest salt flats in the world.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

7. Sarnath nears UNESCO World Heritage status

- In a strategic push to secure global recognition for India's rich Buddhist heritage, the Uttar Pradesh tourism department has intensified efforts to obtain UNESCO World Heritage status for Sarnath, one of the most significant Buddhist pilgrimage sites.
- A crucial meeting was held in Lucknow between officials from the state tourism department and the Archaeological Survey of India (ASI) to finalize preparations ahead of UNESCO's nomination review for the 2025–26 cycles, scheduled for September.



- Sarnath, located near Varanasi, is revered as the place where Gautam Buddha delivered his first sermon after achieving enlightenment, marking it as a pivotal site in Buddhist history.
- The Indian government has officially nominated Sarnath for inclusion in UNESCO's World Heritage list, recognizing the site's profound spiritual and historical importance.
- The nomination seeks to elevate Sarnath, which is currently on UNESCO's tentative list, to full World Heritage Site status.
- The joint meeting aimed to align the necessary documentation and strengthen the management of the site to ensure it meets UNESCO's rigorous selection criteria.
- Among the primary discussions were sustainable tourism practices, ecological preservation, and engaging local communities in the conservation process.
- Additionally, officials emphasized the importance of ensuring that tourism development does not compromise the site's integrity, focusing instead on long-term preservation and responsible tourism.
- One key aspect of the meeting was the promotion of improved infrastructure and connectivity to Sarnath and other locations within the Buddhist circuit, such as Kapilvastu, Shravasti, Sankisa, Kushinagar, and Kaushambi.
- Mukesh Kumar Meshram, the Principal Secretary for Tourism and Culture, stressed that enhanced accessibility via international airports in Varanasi and Kushinagar would provide easier access for international pilgrims, particularly those from countries like Nepal, which have strong Buddhist ties.

- This connectivity is expected to foster greater cultural and religious exchanges, benefiting the local economy and encouraging responsible tourism.
- The state government's efforts to prepare Sarnath for the UNESCO review also include engaging stakeholders from local communities and tourism sectors through consultations.
- These dialogues are designed to ensure that all relevant parties have input into the preservation and sustainable management of the site, thereby fostering greater community involvement and ensuring that the benefits of UNESCO recognition are widely shared.
- The potential inclusion of Sarnath as a UNESCO World Heritage Site would not only enhance the preservation and conservation of this sacred site but also help promote sustainable tourism throughout the region.
- If successful, Sarnath would become Uttar Pradesh's fourth UNESCO World Heritage Site, marking a significant milestone as the first site outside Agra to gain this prestigious status.
- Experts believe that the move will elevate India's global position in heritage conservation and provide a platform for increasing tourism revenue, with an emphasis on preserving the site's integrity for future generations.
- Ultimately, the push for Sarnath's UNESCO recognition is a comprehensive effort to safeguard an essential part of India's Buddhist heritage, promote responsible tourism, and encourage the sustainable development of the region, while also engaging with local communities to ensure a balanced and mutually beneficial outcome.

UNESCO World Heritage status

- UNESCO World Heritage status is awarded to sites that are considered to have exceptional cultural, historical, scientific, or natural significance.
- This recognition helps to preserve and protect the heritage of humanity for future generations.

There are three main categories for World Heritage sites:

Cultural Heritage:

- These are sites that represent human achievement in the arts, architecture, or historical importance.
- Examples include the Pyramids of Egypt, the Great Wall of China, or the historic centers of cities like Rome or Prague.

Natural Heritage:

- These are sites of outstanding natural beauty or ecological importance, such as the Great Barrier Reef in Australia, the Galápagos Islands, or Yellowstone National Park in the U.S.

Mixed Heritage:

- These are sites that have both cultural and natural significance, such as Machu Picchu in Peru or Mount Athos in Greece.

The Process:

- A country nominates a site for consideration.
- An expert committee evaluates the site's significance.
- If approved, the site is inscribed as a World Heritage Site.

Benefits of UNESCO World Heritage Status:

- **Preservation:** The status helps safeguard the site by ensuring international recognition and funding for its protection.

- **Tourism:** Many World Heritage Sites experience increased tourism, which can benefit local economies.
- **Global Recognition:** Being recognized as a World Heritage Site often enhances national pride and can promote cultural and environmental awareness.

India's UNESCO World Heritage List

- India's UNESCO World Heritage List expanded in 2025 with the addition of the Maratha Military Landscapes, bringing the total to 44 sites.
- The new site was inscribed during the World Heritage Committee session in July 2025, recognizing the military architecture of the Maratha rulers.
- Other recent additions to India's tentative list, which is a precursor to World Heritage inscription, include the Kanger Valley National Park, Mudumal Megalithic Menhirs, Ashokan Edict Sites, and Chausath Yogini Temples.

2025 Additions to the World Heritage List

Maratha Military Landscapes of India:

- This collection of forts and fortifications from the 17th to 19th centuries was inscribed during the 47th Session of the World Heritage Committee.



Sarnath

- Sarnath is a historically and spiritually significant site located near Varanasi in Uttar Pradesh, India.
- It's best known as the place where Gautama Buddha first taught the Dharma after attaining enlightenment, making it one of the four main pilgrimage sites for Buddhists (alongside Lumbini, Bodhi Gaya, and Kushinagar).

Religious Importance:

- **First Sermon:** Called the Dhammacakkappavattana Sutta, or "Setting in Motion the Wheel of Dharma", it was delivered to Buddha's five former companions. This marked the beginning of the Buddhist Sangha (community).
- **Deer Park (Mrigadava):** The area where the sermon was delivered is often referred to as the Deer Park.

Historical Sites in Sarnath:

- **Dhamek Stupa:**
 - Built in 500 CE to commemorate the first sermon.
 - Stands 43.6 meters tall and is one of the most prominent structures in Sarnath.
- **Chaukhandi Stupa:**
 - Marks the spot where Buddha met his five disciples.
 - Later modified by the Mughals.
- **Ashokan Pillar:**
 - Erected by Emperor Ashoka in the 3rd century BCE.
 - The capital of this pillar (a group of four lions) is now the national emblem of India.
- **Mulagandha Kuti Vihara:**
 - A modern Buddhist temple with impressive frescoes by Japanese artist Kosetsu Nosu.
 - Near the original site of Buddha's monastic dwelling.
- **Sarnath Archaeological Museum:**
 - Houses significant artifacts, including the Lion Capital of Ashoka, Buddhist sculptures, inscriptions, and relics.
- **International Influence:**
 - Sarnath hosts monasteries and temples built by countries like Japan, Thailand, Myanmar, Sri Lanka, and Tibet — each showcasing their unique architectural styles.

QUESTIONS

29. With reference to **Sarnath**, consider the following statements:

1. It is the site where Gautama Buddha delivered his first sermon, known as the Dhammacakkappavattana Sutta.
2. The Ashokan Lion Capital from Sarnath is the national emblem of India.
3. The Dhamek Stupa at Sarnath was built during Ashoka's reign in the 3rd century BCE.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

30. Consider the following sites related to **Sarnath's Buddhist heritage**:

1. Chaukhandi Stupa – Marks the site where Buddha met his first five disciples.
2. Mulagandha Kuti Vihara – A modern temple with frescoes by a Japanese artist.
3. Sarnath Archaeological Museum – Houses the Lion Capital of Ashoka.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

31. With reference to **UNESCO World Heritage status**, consider the following statements:

1. Sites may be designated as Cultural, Natural, or Mixed heritage.
2. The Okavango Delta in Botswana is an example of a Mixed Heritage Site.
3. The process involves nomination by a country, followed by evaluation and inscription.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

32. With reference to **India's UNESCO World Heritage Sites (as of 2025)**, consider the following statements:

1. The Maratha Military Landscapes were inscribed in 2025, raising India's tally to 44 sites.
2. Sarnath, if inscribed, would become the first World Heritage Site from Uttar Pradesh.
3. Other tentative sites include Kanger Valley National Park and Chausath Yogini Temples.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

33. With reference to **the Buddhist circuit in India**, consider the following:

1. Kapilvastu
2. Shravasti
3. Sankisa
4. Kushinagar
5. Kaushambi

How many of the above are part of the connectivity and tourism plan linked with **Sarnath's UNESCO nomination efforts**?

- | | |
|---------------|--------------|
| A. Only two | C. Only four |
| B. Only three | D. All five |

34. Consider the following pairs: Site of Ashoka's major rock edictsLocation in the State of

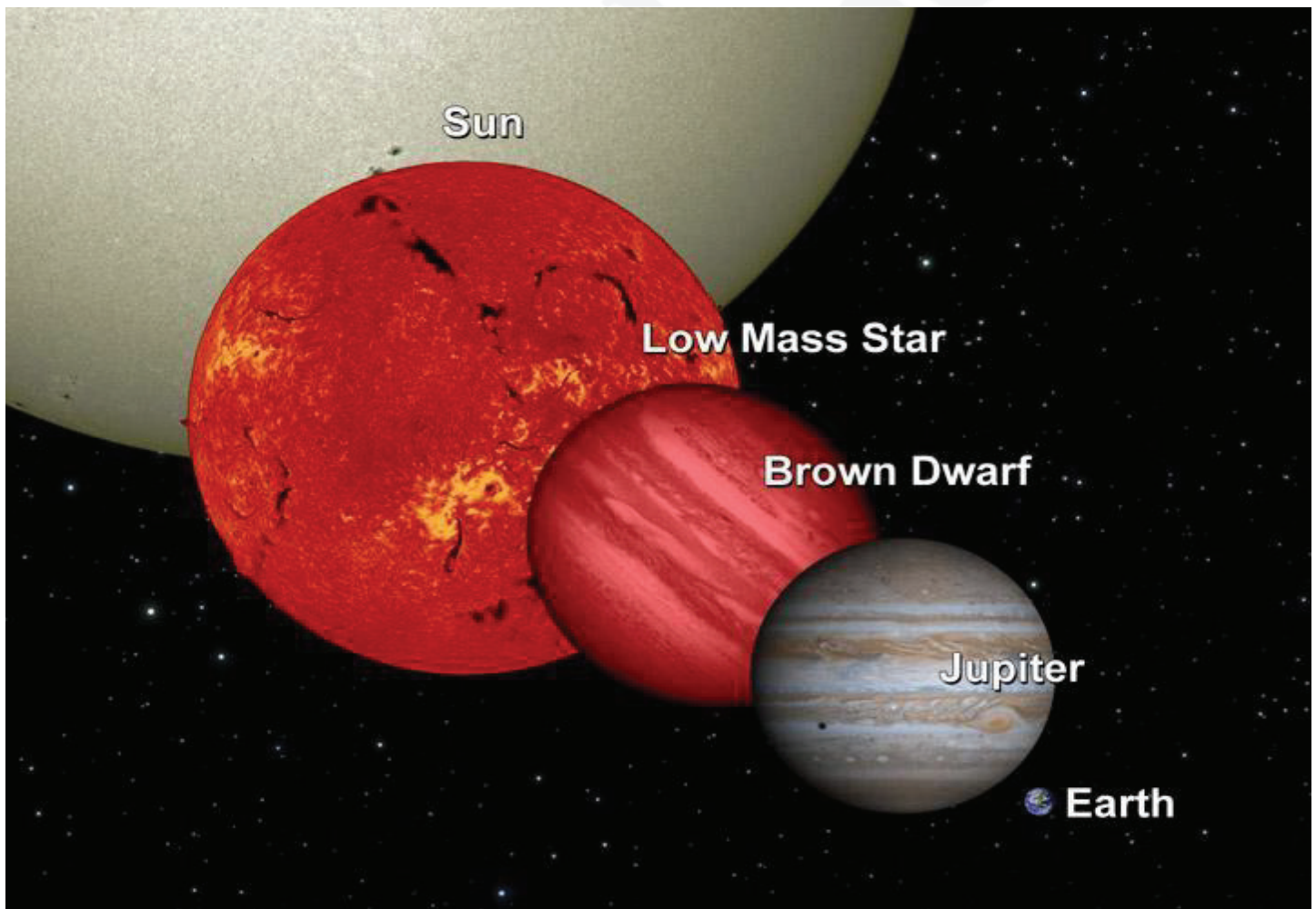
1. Dhauli - Odisha
2. Erragudi - Andhra Pradesh
3. Jaugada - Madhya Pradesh
4. Kalsi - Karnataka

How many pairs given above are correctly matched?

- | | |
|-------------------|---------------------|
| A. Only one pair | C. Only three pairs |
| B. Only two pairs | D. All four pairs |

35. Ashokan inscriptions suggest that the 'Pradeshika', 'Rajuka' and 'Yukta' were important officers at the —
- A. village-level administration
 - B. district-level administration
 - C. provincial administration
 - D. level of the central administration
36. Who among the following rulers advised his subjects through this inscription?
- “Whosoever praises his religious sect or blames other sects out of excessive devotion to his own sect, with the view of glorifying his own sect, he rather injures his own sect very severely.”
- A. Ashoka
 - B. Samudragupta
 - C. Harshavardhana
 - D. Krishnadeva Raya

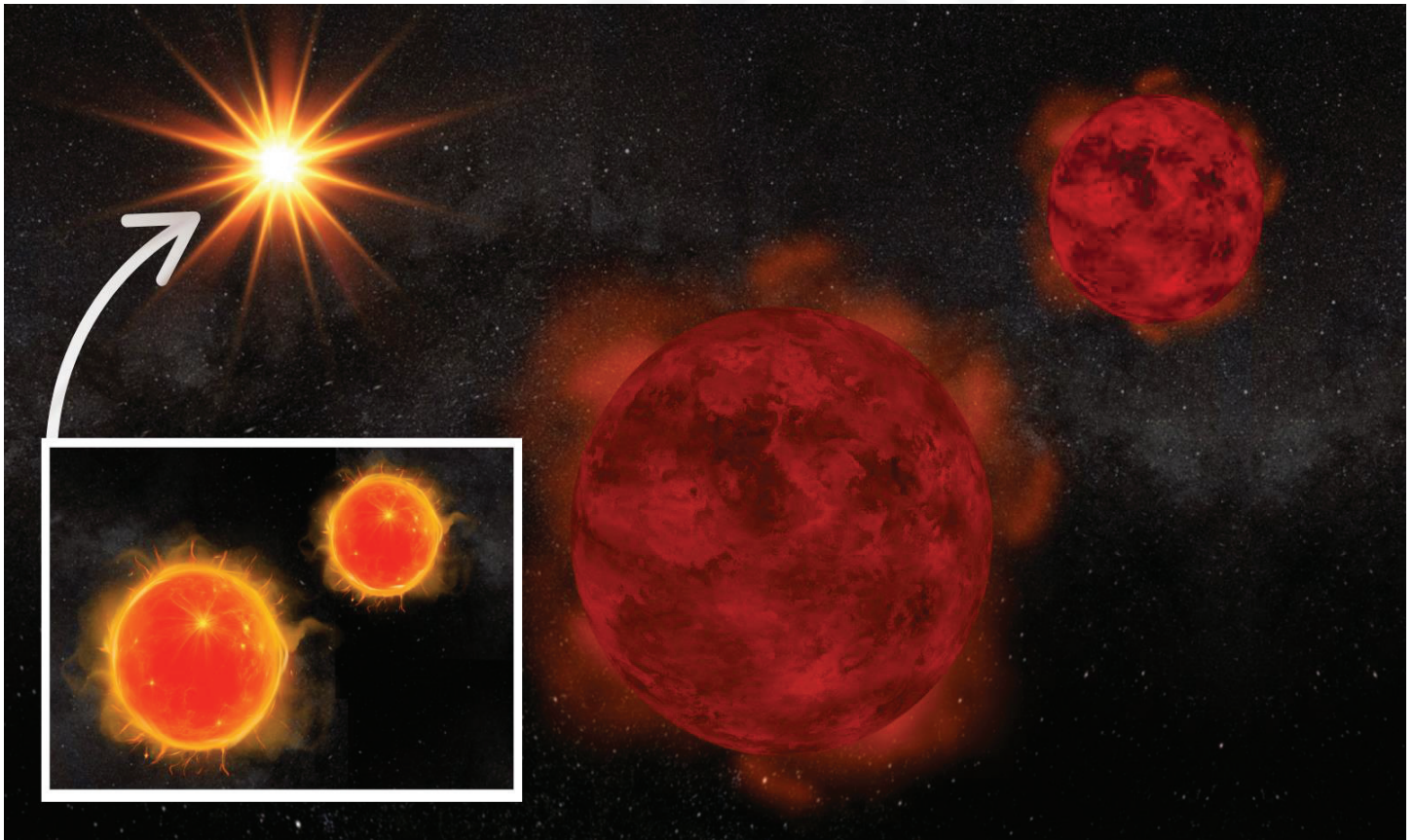
8. Scientists discover a rare quadruple star system in the Milky Way



- In a significant astronomical breakthrough, a team of international scientists has discovered a highly unusual quadruple star system within our Milky Way galaxy.
- This system, named UPM J1040–3551 AabBab, comprises a pair of cold brown dwarfs orbiting around a pair of young red dwarf stars.
- The study detailing this discovery, titled “Benchmark brown dwarfs – I. A blue M2 + T5 wide binary and a probable young [M4 + M4] + [T7 + T8] hierarchical quadruple”.
- Led by Professor Zenghua Zhang of Nanjing University, the research also included contributions from institutions in the UK, Brazil, Chile, and Spain.
- This newly discovered system presents an unprecedented configuration and opens new avenues for the study of brown dwarfs — elusive celestial objects that lie between stars and planets.

What Are Brown Dwarfs?

- Brown dwarfs are often referred to as “failed stars”, as they share certain characteristics with both stars and gas giant planets.
- Like stars, brown dwarfs form through the gravitational collapse of clouds of gas and dust. However, they lack sufficient mass (less than ~ 0.08 solar masses) to sustain hydrogen fusion, the fundamental process that powers stars.
- Despite this limitation, brown dwarfs are significantly larger than planets, with masses up to 70 times that of Jupiter.
- Their atmospheres contain molecules such as water vapor (H_2O), similar to gas giants like Jupiter and Saturn. However, they do not emit significant visible light, making them faint and challenging to observe directly.



Why Are Brown Dwarfs So Difficult to Detect?

- Detecting brown dwarfs is inherently difficult due to their cool temperatures and low luminosity.

- They emit most of their energy in the infrared spectrum, rather than visible light, which requires sensitive instruments and techniques to observe.
- Because of this, astronomers often search for brown dwarfs in binary or multiple star systems, where a brighter companion star can illuminate their existence indirectly.
- When brown dwarfs are part of such a system, scientists can infer their properties — such as mass, age, temperature, and chemical composition — based on measurements of the better-understood, brighter stars.
- This approach offers valuable insights that would otherwise be nearly impossible to obtain.

Why Is the UPM J1040–3551 AabBab System Important?

- This particular quadruple system stands out because of its rare configuration: a hierarchical structure in which two T-type brown dwarfs orbit a pair of young M-type red dwarf stars.
- T-type brown dwarfs are among the coolest and faintest known, and having two of them paired in orbit around two low-mass stars is unprecedented.
- According to Hugh Jones, co-author of the study and researcher at the University of Hertfordshire, “As far as we know, this is the first time a quadruple system has been found with two T-type brown dwarfs orbiting a pair of stars.
- Most brown dwarfs are solitary, and the odds of a brown dwarf having a companion are less than 5%.”
- This discovery provides an important benchmark for studying brown dwarfs in a multi-star environment, where their characteristics can be more accurately constrained and modeled.

Scientific Implications and Future Research

- The rarity of such a system makes it a valuable case study for astronomers seeking to understand how brown dwarfs form and evolve.
- The co-location of brown dwarfs with stars of known age and mass allows researchers to test theories about substellar formation and development, as well as the physical processes that govern stellar multiplicity.
- Additionally, by studying such systems, astronomers hope to gain insights into the initial mass function (IMF) — a key concept that describes how stars and substellar objects are distributed by mass at birth.
- This, in turn, can inform our understanding of galactic structure, planet formation, and even dark matter, which makes up a large but still mysterious portion of the universe’s mass.

Milky Way galaxy

- The Milky Way galaxy is the spiral galaxy that contains our Solar System. It’s our “cosmic home,” and one of billions of galaxies in the universe.
 - **Type:** Barred spiral galaxy
 - **Diameter:** ~100,000–200,000 light-years
 - **Thickness:** ~1,000 light-years in the thin disk
 - **Number of stars:** Estimated 100–400 billion
 - **Mass:** ~1.5 trillion times the mass of the Sun
 - **Distance of the Sun from the center:** ~26,000 light-years

Structure

The Milky Way has a complex structure, including:

- **Galactic Bulge:** Dense central region made up of older stars.



- **Galactic Disk:** Where most stars, gas, dust, and spiral arms (like Orion Arm, where we are) reside.
- **Spiral Arms:** Regions with active star formation; our Solar System lies in the Orion Arm, a minor arm.
- **Galactic Halo:** A spherical region containing old stars and globular clusters.
- **Supermassive Black Hole:** At the center is Sagittarius A*, with a mass ~ 4 million times that of the Sun.

Our Position in the Milky Way

- The Solar System is located about two-thirds of the way out from the center.
- It takes the Sun around 225–250 million years to orbit the galaxy once — this is called a galactic year.

How We Study It

- Because we are inside the Milky Way, we can't see it from the outside directly.
- We use infrared, radio, and x-ray telescopes to peer through cosmic dust and map its structure.
- Gaia and other missions have helped map billions of stars to reconstruct the galaxy in 3D.
- On a dark night, the Milky Way appears as a glowing band across the sky — this is the disk seen edge-on.
- The Milky Way and Andromeda Galaxy are on a collision course and will merge in about 4 billion years, forming a new galaxy nicknamed “Milkomeda.”
- It's part of a small group of galaxies called the Local Group, which is part of the Laniakea Supercluster.

QUESTIONS

37. With reference to **brown dwarfs**, consider the following statements:

1. They are formed through gravitational collapse like stars but lack sufficient mass for sustained hydrogen fusion.
2. Their mass can be up to about 70 times that of Jupiter.
3. They emit most of their radiation in the infrared spectrum, not visible light.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

38. With reference to the **UPM J1040–3551 AabBab system**, consider the following statements:

1. It consists of a pair of red dwarf stars and a pair of T-type brown dwarfs.
2. It is the first known quadruple system with two T-type brown dwarfs orbiting stars.
3. Most brown dwarfs discovered so far exist in multiple-star systems.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

39. With reference to the scientific importance of studying quadruple star systems containing brown dwarfs, consider the following statements:

1. They provide benchmark cases to test theories of substellar formation.
2. They help constrain the initial mass function (IMF).
3. They offer insights into the distribution of dark matter in galaxies.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

40. With reference to the **Milky Way galaxy**, consider the following statements:

1. It is classified as a barred spiral galaxy.
2. The Sun is located in the Orion Arm, about two-thirds from the Galactic Centre.
3. The galaxy's central black hole, Sagittarius A*, is about 40 million times the Sun's mass.

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

41. With reference to the **future evolution of the Milky Way**, consider the following statements:

1. It will eventually collide with the Andromeda Galaxy.
2. This collision is expected in about 4 billion years.
3. The merged galaxy is often nicknamed “Milkomeda.”

How many of the above statements are correct?

- | | |
|-------------|--------------|
| A. Only one | C. All three |
| B. Only two | D. None |

42. 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 statement(s) given above is/are correct?

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

43. Consider the following statements:

1. **Statement-I:** Giant stars live much longer than dwarf stars.
2. **Statement-II:** Compared to dwarf stars, giant stars have a greater rate of nuclear reactions.

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

- A. Both Statement-I and Statement-II are correct and Statement-II explains Statement-I
- B. Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I
- C. Statement-I is correct, but Statement-II is incorrect
- D. Statement-I is incorrect, but Statement-II is correct explain

ANSWER KEY AND EXPLANATION

1. A Differing interpretations of the Sugauli Treaty of 1816

The **Sugauli Treaty (1816)**, signed between British India and Nepal, identified the **Kali River** as the boundary. However, the treaty did not clearly define the river's source. India and Nepal interpret this origin differently, leading to the dispute.

2. B It serves as a vantage point for monitoring the India-China border.

Kalapani, located at a high altitude near the trijunction of India, Nepal, and China, provides India with an **observation post** crucial for monitoring Chinese movements across Tibet.

3. A 1 and 2 only

Lipulekh Pass facilitates **border trade between India and China** and is a **route for the Kailash Mansarovar Yatra**. It is near the **India-Nepal-China trijunction**, not Bhutan—so statement 3 is incorrect.

4. A The Kali River originates from Limpiyadhura.

Nepal argues that the **Kali River's source is Limpiyadhura**, northwest of Lipulekh. If this interpretation is accepted, the disputed areas fall to the east of the river, thus within Nepal. India, however, traces the source to a stream below Lipulekh.

5. A 1 and 2 only

- **Statement 1 is correct:** A **Joint Technical Level Boundary Working Group** was created in the 1980s.
- **Statement 2 is correct:** Disputed areas include **Kalapani, Lipulekh, and Susta**.
- **Statement 3 is incorrect:** The border is **not fully demarcated**; disputes persist.

6. A 1 and 2 only

Project 17A frigates (Nilgiri-class) succeed the **Shivalik-class** and are being built by **MDL and GRSE**. They are **multi-mission frigates** capable of anti-surface, anti-air, and anti-submarine warfare.

7. B 1 and 2 only

The 2025 commissioning was historic because two ships—*Udaygiri* (MDL) and *Himgiri* (GRSE)—were commissioned together. *Udaygiri* is the **100th WDB design**. Statement 3 is wrong because *Himgiri* was built by GRSE.

8. D 1, 2 and 3

- **BrahMos** is used for surface-to-surface strike.
- **Barak-8** is an anti-air missile system.
- **Humsa NG** is an advanced sonar system.

All three matches are correct.

9. D 1, 2 and 3

- **Cochin Shipyard (CSL):** builds aircraft carriers (INS Vikrant), commercial vessels, offshore platforms.
- **GRSE:** specializes in corvettes, frigates, Coast Guard ships.
- **HSL:** builds submarines, tankers, bulk carriers, and handles large ship repairs.

Hence all three are correct.

10. C Both 1 and 2

INS *Udaygiri* carries the motto “**Sanyuktaha Paramojayaha**”, and INS *Himgiri* carries “**Adrushyam Ajayam**”. Both are correct.

11. D 1, 2 and 3

QRSAM has a range of **3–30 km**, protects **moving armoured formations**, and uses two radars—**Battery Surveillance Radar** and **Multifunction Radar**—both offering 360° coverage.

12. C 1 and 3 only

VSHORADS is a **fourth-generation MANPAD** and is effective against **low-altitude threats including drones and helicopters**. Its range is **300 m to 6 km**, not less than 1 km, so statement 2 is incorrect.

13. D 1, 2 and 3

All pairs are correct. **DEW** is laser-based (anti-UAV), **QRSAM** provides medium-range coverage, and **VSHORADS** acts as last-line defence.

14. A 1 and 2 only

The **Command and Control Centre** was developed by **DRDL, Hyderabad**. It enables **automated real-time threat assessment** and engagement, not manual intervention, so statement 3 is incorrect.

15. C 1 and 3 only

IADWS offers **multi-layered indigenous coverage up to 30 km**, reducing reliance on imports. It is especially designed for **drone swarm and low-flying target defence**. Statement 2 is incorrect.

16. C All three

All three are correct – VoICE initiated the model, the pilot cost ~₹50 lakh and was implemented by 24 companies (mostly startups/SMEs), and the CM announced replication across **3,500 villages** in Maharashtra.

17. D All four

All four are explicitly part of Satnavari’s interventions – IoT for soil & water, AI pest detection, drones for precision farming, and IoT-based waste bins for waste management.

18. B Only two

Statements 1 and 2 are correct (sensors for fisheries, 55 lpcd water supply). Statement 3 is incorrect – reduction figures were given for **fertilizer and pesticide usage in agriculture**, not fisheries or water.

19. D All four

All four are explicitly part of the Satnavari project: **digital classrooms, smart streetlights, fire safety balls with drones**, and a **C-NOC** for centralized monitoring.

20. C All three

All three are correct – farmers use apps for climate/natural farming, youth receive drone training (employment generation), and ASHA workers are empowered with diagnostic tools for faster healthcare response.

21. C All three

The Bill covers **16 Acts under 10 ministries**, decriminalises **288 provisions** (out of 355 amendments), and introduces **finances, warnings, and improvement notices** instead of imprisonment for minor offences.

22. C Only three

The RBI Act, Apprentices Act, and Electricity Act are included in the 2025 Bill. **Wildlife Protection Act, 1972 is not part of it.**

23. C All three

- **75% of offences** are non-core (taxation, shipping, finance).
- **50%+ business laws** have jail clauses.
- **37.8% of compliances** carry imprisonment.

All three reflect the research findings cited in the Bill's background.

24. C All three

- **Jan Vishwas 1.0 (2023):** 42 Acts, ~183 provisions.
- **Jan Vishwas 2.0 (2025):** 16 Acts, 355 provisions (288 decriminalised).
- Both have **10% periodic penalty increase**, and 2.0 adds **improvement notices** for first-time lapses.

25. C All three

All are correct — penalties are graded, the Bill has been referred to a **Select Committee of the Lok Sabha**, and it introduces **warnings/improvement notices** for first-time violators.

26. B Only two

Statements 1 and 2 are correct — the **Okavango Delta is a UNESCO site** (2014) and has **no outlet to the sea**. But it is located in **northern Botswana**, far from Gaborone in the south.

27. C All three

All three are correct — Botswana achieved **WHO gold-tier recognition**, its programmes were supported by **PEPFAR and Global Fund**, and **US aid cuts in 2025 weakened funding**.

28. C All three

All three are correct — Botswana is **landlocked**, borders **four countries**, and has the **Makgadikgadi Pans**, a vast salt flat system.

29. B Only two

Statements 1 and 2 are correct. Sarnath is where Buddha first preached, and Ashoka's Lion Capital is India's national emblem. But the **Dhamek Stupa was built in 500 CE**, not during Ashoka's reign — though Ashoka did erect monuments there.

30. C All three

All three are correct — Chaukhandi Stupa is linked to Buddha's meeting with disciples, Mulagandha Kuti Vihara has frescoes by **Kosetsu Nosu (Japanese artist)**, and the Archaeological Museum preserves Ashoka's Lion Capital.

31. B Only two

Statements 1 and 3 are correct. UNESCO categories include **Cultural, Natural, and Mixed heritage**; the process is nomination → evaluation → inscription. However, the **Okavango Delta is a Natural Heritage Site**, not Mixed.

32. B Only two

Statements 1 and 3 are correct. The Maratha Military Landscapes were added in 2025 (India = 44 sites), and Kanger Valley + Chausath Yogini Temples are on the tentative list. Statement 2 is incorrect: UP already has sites in Agra (Taj Mahal, Agra Fort, Fatehpur Sikri). Sarnath would be the **first outside Agra**.

33. D All five

All five — **Kapilvastu, Shravasti, Sankisa, Kushinagar, and Kaushambi** — were explicitly mentioned in the connectivity and tourism development plan tied to Sarnath's nomination, aiming to boost the **Buddhist circuit**.

34. B Only two pairs

Out of the four pairs, **Dhauli–Odisha** and **Erragudi–Andhra Pradesh** are correctly matched. Jaugada belongs to Odisha (not MP), and Kalsi belongs to Uttarakhand (not Karnataka).

- **Dhauli – Odisha** □

Correct. Dhauli, near Bhubaneswar in **Odisha**, is a well-known site of Ashoka's Major Rock Edicts.

- **Erragudi – Andhra Pradesh** □

Correct. Erragudi (modern Yerragudi, in Kurnool district) in **Andhra Pradesh** has Ashoka's Major Rock Edicts.

- **Jaugada – Madhya Pradesh**

Incorrect. Jaugada is in **Odisha (Ganjam district)**, not Madhya Pradesh.

- **Kalsi – Karnataka**

Incorrect. Kalsi is in **Uttarakhand (near Dehradun)**, not Karnataka.

35. B district-level administration

- **Pradeshika** – Mentioned as provincial/district governors who toured every five years to ensure law and order.
- **Rajuka** – Officers responsible for administration of justice and also involved in revenue collection. Ashoka entrusted them with both judicial and moral duties (Dhamma).
- **Yukta** – Revenue officials who handled accounts and maintained financial records.
- Together, these three officials are consistently associated in Ashoka's inscriptions (e.g., Pillar Edicts), and they functioned primarily at the **district level** to implement Mauryan administration.

Thus, the Ashokan inscriptions clearly establish them as **district-level officers**.

36. A Ashoka

- This inscription comes from **Ashoka's Rock Edicts** (notably the **12th Rock Edict**).
- The **12th Rock Edict** emphasizes **religious tolerance** and discourages sectarian criticism.

- Ashoka, after the Kalinga war, promoted **Dhamma policy** — stressing compassion, non-violence, respect for all sects, and harmony among communities.
- Neither Samudragupta, Harshavardhana, nor Krishnadeva Raya is known for issuing such edicts. Their inscriptions dealt mainly with military conquests, donations, and cultural patronage.

Hence, the statement clearly belongs to **Ashoka's edicts**.

37. C All three

All three are correct. Brown dwarfs form like stars but don't sustain hydrogen fusion (<0.08 solar mass). They can be as massive as 70 Jupiter masses and are best studied in the infrared since they are faint in visible light.

38. B Only two

Statements 1 and 2 are correct. The system is indeed a hierarchical quadruple with **red dwarfs + T-type brown dwarfs**, unique in astronomy. Statement 3 is wrong — most brown dwarfs are solitary; the probability of them having companions is less than 5%.

39. C All three

All three are correct. Such systems are rare “natural laboratories” to study substellar formation, IMF distribution, and even galactic mass composition (including dark matter correlations).

40. B Only two

Statements 1 and 2 are correct. The Milky Way is a **barred spiral galaxy**, Sun lies $\sim 26,000$ light-years away in the **Orion Arm**. But Sagittarius A* has a mass of ~ 4 million solar masses, not 40 million.

41. C All three

All three are correct. The Milky Way and Andromeda are on a collision course; in ~ 4 billion years they will merge into a larger elliptical galaxy called “**Milkomeda**.”

42. B 1 and 3 only

Statement 1: “Asteroids are small rocky planetoids, while comets are formed of frozen gases held together by rocky and metallic material.” Correct.

- **Asteroids** = mainly rocky/metallic, found in the **asteroid belt**.
- **Comets** = icy + dusty bodies, called “dirty snowballs”, made of frozen gases (water, methane, ammonia, CO_2) with rock/dust mixed in.

Statement 2: “Asteroids are found mostly between the orbits of Jupiter and Mars, while comets are found mostly between Venus and Mercury.” Incorrect.

- Asteroids $\rightarrow$ indeed found between Mars and Jupiter (**Asteroid Belt**).
- Comets $\rightarrow$ come from the **Kuiper Belt** (beyond Neptune) and the **Oort Cloud** (far outer Solar System), NOT between Venus and Mercury.

Statement 3: “Comets show a perceptible glowing tail, while asteroids do not.”

- Correct.
- When a comet approaches the Sun, its ice sublimates, releasing gas and dust $\rightarrow$ forms a **coma** + glowing **tail** pointing away from the Sun.
- Asteroids do not develop tails.

43. D Statement-I is incorrect, but Statement-II is correct

Statement I: Incorrect.

- **Lifespan of stars depends on their mass.**
- **Giant stars** (massive stars) burn their nuclear fuel **much faster** due to higher pressure and temperature in their cores. Hence, they have **short lifespans** (millions to hundreds of millions of years).
- **Dwarf stars** (especially red dwarfs, like Proxima Centauri) burn fuel very slowly, living for **billions to trillions of years**. So, Statement I is **wrong**.

Statement II: Correct.

- Giants have much higher mass → higher core temperature and pressure → much **faster nuclear fusion rates** than dwarfs.
- That is why they shine brighter but also “die young.”

