

# UPSC CURRENT AFFAIRS

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# 1. Perumbidugu Mutharaiyar, in whose honour V-P released a stamp

## 1. Who Was Perumbidugu Mutharaiyar?

- Perumbidugu Mutharaiyar II (705–745 CE), also known as Suvaran Maran or Shatrubhayankar, was a prominent ruler of the Mutharaiyar dynasty.
- The Mutharaiyars were feudatories of the Pallava dynasty, who gained increasing autonomy as Pallava power declined.
- Though technically a vassal, Perumbidugu Mutharaiyar exercised independent authority and is remembered as a brave warrior and capable administrator.
- He fought alongside Pallava king Nandivarman in several battles.

## 2. Region and Political Influence

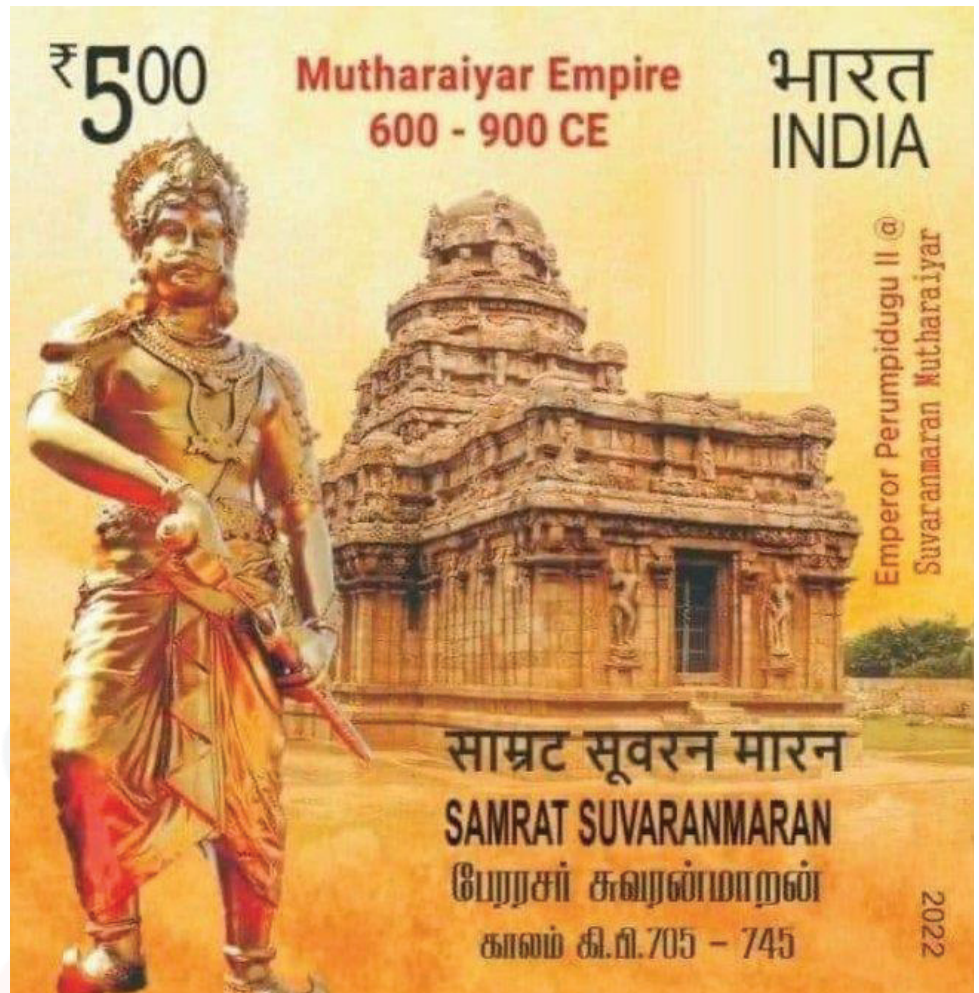
- The Mutharaiyars ruled over large parts of central Tamil Nadu, including:
  - Thanjavur
  - Perambalur
  - Pudukkottai
  - Tiruchirappalli
  - Cauvery river belt
- Perumbidugu Mutharaiyar is believed to have ruled from Tiruchirappalli for nearly four decades.

## 3. Religious and Cultural Contributions

- The Pallava period saw a revival of Hinduism amid Jain and Buddhist influence.
- As Pallava feudatories, the Mutharaiyars became notable temple builders.
- Suvaran Maran patronised Shaivism, while also encouraging intellectual debate.
- Jain Acharya Vimalachandra visited his court and engaged in debates with Shaivas, Pasupatas, Buddhists, and Kapalikas, showing the ruler's openness to scholarly discourse.

## 4. Contributions to Temple Architecture

- Historians credit the Mutharaiyars with shaping early South Indian temple architecture.



### According to scholar K.V. Soundara Rajan:

- They influenced later Chola temple architecture.
  - Built cave temples, structural stone temples, and mandapas.
  - Their architectural activity predates the rise of the Vijayalaya Cholas.
  - The dynasty was eventually defeated when Vijayalaya Chola captured Thanjavur.

### 5. Historical Recognition

- Inscriptions across Tamil Nadu highlight Perumbidugu Mutharaiyar's:
  - Temple endowments
  - Irrigation works
  - Patronage of Tamil literature
- Scholars regard him as one of the most significant rulers of early medieval Tamil Nadu.

### 6. Why the Stamp Was Released Now

- The commemorative stamp was released by Vice-President C. P. Radhakrishnan as part of the Centre's initiative to honour unsung Tamil rulers.
- Tamil Nadu's DMK government had long demanded the stamp.
- His 1,350<sup>th</sup> birth anniversary was observed statewide in 2024.
- The Mutharaiyar community, influential in central Tamil Nadu and classified as Most Backward Class (MBC), reveres Suvaran Maran as a cultural icon.

### 7. Political and Cultural Significance

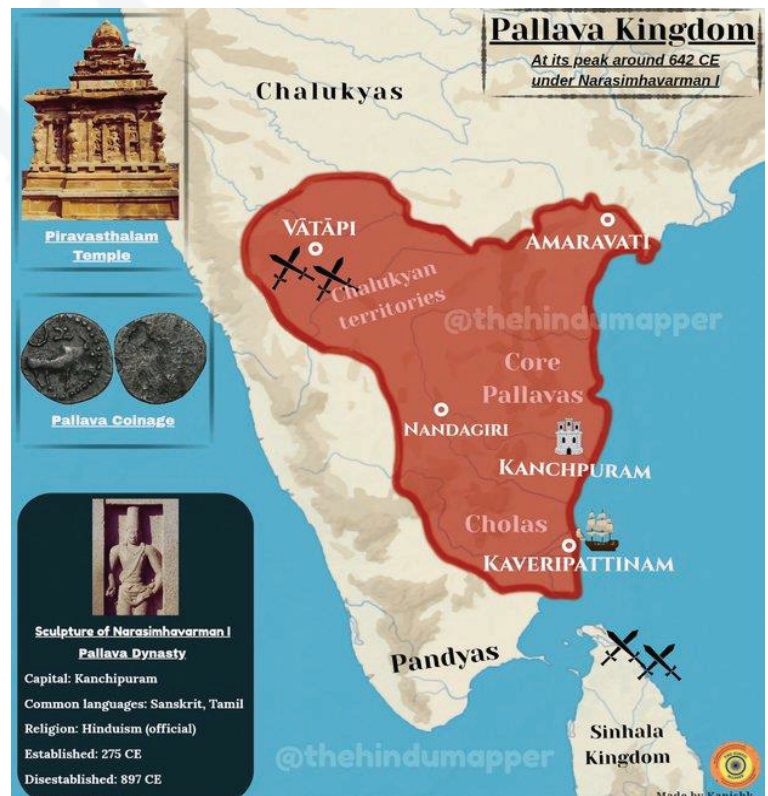
- **The stamp reflects:**
  - Recognition of regional historical heroes
  - Efforts to broaden Tamil pride narratives

### 8. What the Vice-President Said

- Radhakrishnan described Perumbidugu Mutharaiyar as:
  - A ruler of administrative stability and military prowess
  - A patron of culture, temples, irrigation, and literature
  - He emphasised that recognising such figures helps revive cultural pride as India moves toward Viksit Bharat.

### 9. Legacy

- **Perumbidugu Mutharaiyar stands as:**
  - A bridge figure between Pallava and Chola eras
  - A symbol of regional power, cultural synthesis, and social mobility
  - One of the earliest architects of Tamil political and cultural identity





## Pallava Dynasty

### Capital

- Kanchipuram (a major center of learning, religion, and art)

### Important Rulers

- **Simhavishnu** – Founder of Pallava power
- **Mahendravarman I** – Patron of art; introduced rock-cut architecture
- **Narasimhavarman I (Mamalla)** – Defeated Chalukya king Pulakeshin II; built Mamallapuram
- **Narasimhavarman II (Rajasimha)** – Built grand structural temples

### Architecture & Art

- Pioneers of Dravidian temple architecture

### Famous monuments:

- Shore Temple, Mahabalipuram
- Pancha Rathas
- Kailasanatha Temple, Kanchipuram
- Transition from rock-cut caves to structural stone temples

### Religion

- Promoted Hinduism, especially Shaivism and Vaishnavism
- Tolerant toward Buddhism and Jainism

### Education & Culture

- Kanchipuram became a major center of learning
- Patronage to Sanskrit and Tamil literature

### Frequent conflicts with:

- Chalukyas of Badami
- Pandyas
- Eventually declined due to the rise of the Chola dynasty

## QUESTIONS

1. Consider the following statements regarding **Perumbidugu Mutharaiyar II**:

1. He was a ruler of the Mutharaiyar dynasty, which functioned as a feudatory under the Pallavas.
2. He exercised considerable independent authority despite being a Pallava vassal.
3. He was eventually defeated by Vijayalaya Chola, leading to the decline of the Mutharaiyars.
4. He ruled primarily from Kanchipuram, the Pallava capital.

Which of the statements given above are correct?

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

2. With reference to the **Mutharaiyars and early South Indian temple architecture**, consider the following statements:

1. The Mutharaiyars were involved in building cave temples, mandapas, and early structural stone temples.
2. Their architectural contributions influenced later Chola temple architecture.
3. Their temple-building activity occurred after the rise of the Vijayalaya Cholas.
4. Their architectural tradition emerged during the Pallava period.

Which of the statements given above are correct?

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

3. Consider the following statements about the religious and cultural milieu during Perumbidugu Mutharaiyar's reign:

1. He was a patron of Shaivism during a period marked by the revival of Hinduism.
2. His court encouraged intellectual debates among Shaivas, Jains, Buddhists, and other sects.
3. Jain Acharya Vimalachandra is known to have visited his court.
4. He actively suppressed Jain and Buddhist traditions in his kingdom.

Which of the statements given above are correct?

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

4. Which of the following statements is **not correct** regarding the **Brihadiswara Temple**?

- A. It is dedicated to Lord Shiva.
- B. It was built by Rajendra Chola.
- C. This temple was the first in India to have two large gopuras.
- D. It has a two-storeyed sanctum for housing the main deity of the temple.

5. Consider the following statements regarding the Chola Empire and its administration:

1. All the authority rested in the King's hands, with a Council of Ministers to advise him.
2. The affairs of the village were managed by an executive committee to which educated persons owning property were elected either by drawing lots or by rotation.

Which of the statements given above is/are **not correct**?

- |           |                    |
|-----------|--------------------|
| A. 1 only | C. Both 1 and 2    |
| B. 2 only | D. Neither 1 nor 2 |

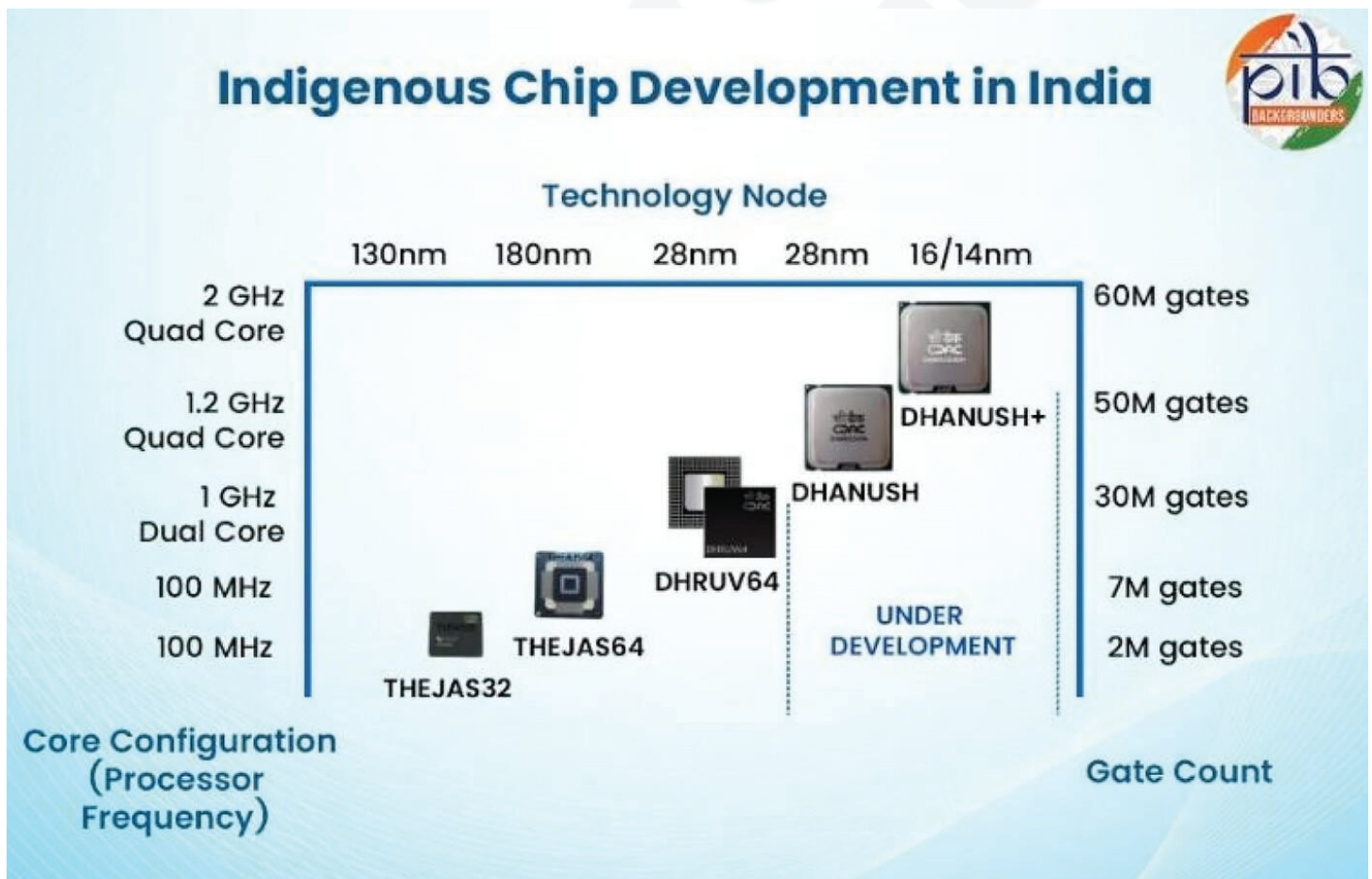
6. With reference to the **Chola administration**, consider the following statements:

1. The basic unit of administration was the **nadu**, which consisted of a number of villages.
2. The Chola state was divided into **mandalams (provinces)**, and the **nadus** were grouped into **valanadus**.
3. During the Chola period, **ur** functioned as the general assembly of the village.
4. The villages practiced a **well-developed system of local self-government**.

How many of the above statements are correct?

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

## 2. DHRUV64 – nation's first homegrown 1.0 GHz, 64-bit dual-core architecture microprocessor



- India has achieved a milestone by successfully developing DHRUV64 – nation's first homegrown 1.0 GHz, 64-bit dual-core architecture microprocessor.

- The semiconductor is developed by the Centre for Development of Advanced Computing (C-DAC) under the Microprocessor Development Programme (MDP).
- DHRUV64 is said to provide a reliable, fully indigenous processor technology capable of supporting both strategic and commercial applications.

### DHRUV64 microprocessor:

- Key features and uses cases DHRUV64 is built on modern architectural features that are designed to deliver higher efficiency, enhanced multitasking capability and improved reliability across various applications.
- The microprocessor is suitable for 5G infrastructure, automotive systems, consumer electronics, industrial automation and the Internet of Things (IoT).
- According to the official communication, DHRUV64 leverages modern fabrication technologies that enables it to easily integrate with a wide range of external hardware systems.
- Microprocessors are essentially “brains” of modern electronic devices such as mobiles, computers, satellites and even defense systems.
- India consumes around 20% of all the microprocessors manufactured globally and the milestone means that India can reduce reliance on foreign suppliers for its use cases.
- What next after DHRUV64 semiconductor DHRUV64 essentially joins an expanding India-made processor family developed in recent years:
  - SHAKTI (2018, IIT Madras): Focus on strategic, space, and defense applications.
  - AJIT (2018, IIT Bombay): Used for industrial and robotics applications.
  - VIKRAM (2025, ISRO–SCL): Engineered to withstand extreme space conditions.
  - THEJAS64 (2025, C-DAC): Designed for industrial automation. C-DAC is already working on the next generation of RISC-V processors: the Dhanush and Dhanush+ SoCs that are expected to further expand the range of indigenous options available for both strategic and commercial use.

### What is a Microprocessor?

- A microprocessor is the brain of a computer or electronic device. It processes instructions and controls other components like memory, input, and output devices.
- **Main Functions**
  - Fetch instructions from memory
  - Decode instructions
  - Execute instructions
  - Store results
- This is called the Fetch–Decode–Execute cycle.



### Key Components of a Microprocessor

#### ALU (Arithmetic Logic Unit)

- Performs calculations (addition, subtraction, AND, OR, comparisons)

#### Control Unit (CU)

- Directs operations and controls data flow

#### Registers

- Small, fast memory inside the processor
- Examples: Accumulator, Program Counter, Instruction Register



## Clock

- Controls the speed of operations (measured in MHz or GHz)

## Important Characteristics

- **Word Size:** 8-bit, 16-bit, 32-bit, 64-bit
- **Clock Speed:** How fast instructions are processed
- **Instruction Set:** Commands the processor understands

## Architecture:

- CISC (Complex Instruction Set Computer)
- RISC (Reduced Instruction Set Computer)

## Types of Microprocessors

- **General-purpose** – PCs, laptops (Intel, AMD)
- **Embedded** – Washing machines, cars, microwaves
- **Mobile processors** – Smartphones (ARM-based)

## Internet of Things (IoT):

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### What makes up IoT?

#### Devices (Things)

- Sensors, actuators, appliances, machines, vehicles, wearables, etc.

#### Connectivity

- Wi-Fi, Bluetooth, Cellular (4G/5G), LPWAN (LoRaWAN, NB-IoT), Ethernet.

#### Data Processing

- Edge devices, gateways, or cloud platforms analyze data.

#### User Interface

- Mobile apps, dashboards, alerts, or automation systems.

### How IoT works (simple flow)

- Sensor collects data (*e.g.*, temperature)
- Data is sent over a network
- Software processes the data
- Action is triggered or insight is shown to users

## Common IoT Applications

### Smart Homes

- Smart lights, thermostats, security cameras
- Voice assistants (Alexa, Google Home)

### Industrial IoT (IIoT)

- Predictive maintenance
- Equipment monitoring
- Supply chain optimization

### Transportation

- Fleet tracking
- Smart traffic systems
- Connected cars

### Healthcare

- Wearable health monitors
- Remote patient monitoring
- Smart medical devices

## Agriculture

- Smart irrigation
- Soil and crop monitoring
- Livestock tracking

## Smart Cities

- Waste management
- Energy-efficient lighting
- Air quality monitoring

## Benefits of IoT

- Automation and efficiency
- Real-time monitoring
- Cost reduction
- Better decision-making
- Improved safety and convenience

## Challenges of IoT

### Security & privacy risks

- Data management and scalability
- Interoperability between devices
- Power consumption
- Network reliability

## Example

- **A smart thermostat:**
  - Measures room temperature
  - Sends data to the cloud
  - Learns user behavior
  - Automatically adjusts heating/cooling to save energy

## QUESTIONS

7. Consider the following statements regarding **DHRUV64 microprocessor**:

1. DHRUV64 is India's first indigenously developed 64-bit dual-core microprocessor operating at 1.0 GHz.
2. It has been developed by the Centre for Development of Advanced Computing (C-DAC) under the Microprocessor Development Programme (MDP).
3. DHRUV64 is exclusively meant for defence and space applications.

Which of the statements given above is/are correct?

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

8. With reference to **India's indigenous microprocessor ecosystem**, consider the following statements:

1. SHAKTI microprocessor developed by IIT Madras focuses on strategic, space, and defence applications.
2. AJIT microprocessor developed by IIT Bombay is primarily designed for industrial and robotics applications.
3. VIKRAM microprocessor developed by ISRO-SCL is engineered to withstand extreme space conditions.
4. All the above processors are based on imported proprietary instruction set architectures.

Which of the statements given above is/are correct?

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

9. Consider the following statements about **microprocessors and their applications in IoT**:

1. A microprocessor performs the fetch–decode–execute cycle to process instructions.
2. ALU, Control Unit and Registers are core internal components of a microprocessor.
3. Microprocessors used in IoT applications must necessarily rely on cloud-based data processing.
4. Indigenous microprocessors like DHRUV64 can reduce India's dependence on foreign semiconductor suppliers.

Which of the statements given above is/are correct?

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

10. Consider the following statements:

1. It is expected that the **Majorana 1 chip** will enable **quantum computing**.
2. The **Majorana 1 chip** has been introduced by **Amazon Web Services (AWS)**.
3. **Deep learning** is a subset of **machine learning**.

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

## 3. New \$1 million 'Trump Gold Card' visa programme

### What Is the Trump Gold Card?

- A new \$1 million residency-by-payment visa programme launched by the Trump administration
- Offers US residency, work rights, and a pathway to citizenship
- Applications opened December 10
- **Official website:** [trumpcard.gov](https://trumpcard.gov)
  - Features a card branded with President Donald Trump's image and signature



## Replaces Existing EB-5 Visa

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### EB-5 visa programme (est. 1990) required:

- \$1.05 million investment (\$800,000 in special cases)
- Creation of 10 US jobs
- 14,000 EB-5 visas issued last year
- Trump Gold Card eliminates job-creation requirements

### Visa Status & Processing

- Approved applicants receive EB-1 or EB-2 visa status
- Reserved for individuals with extraordinary ability or merit
- Expedited processing expected within weeks

### Applicants must:

- Be admissible to the US
- Be eligible for lawful permanent residence

### Types of Trump Cards

#### 1. Trump Gold Card (Individual)

- \$15,000 non-refundable processing fee
- \$1 million “gift” to the US government
- Additional State Department fees may apply
- No requirement to invest in businesses or create jobs

#### 2. Trump Corporate Gold Card

- For companies sponsoring foreign employees
- \$15,000 DHS fee per employee
- \$2 million gift per employee
- **Includes:**
  - 1% annual maintenance fee
  - 5% transfer fee
  - Sponsorship can be transferred to another employee

#### 3. Trump Platinum Card

- \$5 million contribution
- Allows residence up to 270 days/year
- No tax on foreign income
- No travel visa required
- Currently on waitlist; price may increase
- **Potential Benefits**
  - Attracts high-net-worth individuals
  - Could stimulate the US economy
  - Faster, less bureaucratic immigration pathway



## QUESTIONS

11. Consider the following statements regarding the **Trump Gold Card visa programme**:

1. The Trump Gold Card offers U.S. residency, work rights, and a pathway to citizenship in return for a monetary contribution.
2. Unlike the earlier EB-5 visa programme, the Trump Gold Card does not mandate the creation of jobs in the United States.
3. The Trump Gold Card requires applicants to invest the contributed amount in U.S. businesses.

Which of the statements given above are correct?

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

12. With reference to the **Trump Gold Card visa programme**, consider the following statements:

1. Approved applicants under the Trump Gold Card programme are granted EB-1 or EB-2 visa status.
2. The Trump Platinum Card allows residence in the U.S. without any restriction on the number of days per year.
3. The Trump Corporate Gold Card allows companies to transfer sponsorship to another employee.

Which of the statements given above are correct?

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

13. With reference to the **H-1B visa programme**, consider the following statements:

1. The H-1B visa is meant for foreign workers employed in specialist occupations requiring at least a bachelor's degree.
2. The number of H-1B visas issued annually is fixed at 85,000, including visas reserved for advanced degree holders.
3. Selection of H-1B visa applicants is done purely on a first-come-first-served basis.

Which of the statements given above are correct?

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

14. With reference to the **H-1B visa programme and the recent U.S. fee clarification**, consider the following statements:

1. The H-1B visa was introduced through the Immigration Act of 1990 to meet specialised labour shortages in the United States.
2. The newly announced USD 100,000 fee on H-1B visas is an annual recurring payment applicable to all existing H-1B holders.
3. Indian professionals constitute more than 70% of the total H-1B visas granted annually.

Which of the statements given above are correct?

- A. Only one
- B. Only two

- C. Only three
- D. All the four

15. With reference to **India and the United States as representative democracies**, consider the following statements:

1. Both India and the United States follow a system of **representative democracy**, where citizens elect their representatives to govern on their behalf.
2. India has a **parliamentary form of government**, while the United States follows a **presidential form of government**.
3. In both countries, the head of the government is directly elected by the people.

Which of the statements given above are correct?

- A. Only one
- B. Only two

- C. Only three
- D. All the four

## 4. Australia has banned social media for kids under 16

### What is the ban?

- Australia has banned under-16s from using major social media platforms.
- New accounts are prohibited and existing accounts are being deactivated.
- This is the first national ban of its kind and is being closely watched globally.



## Why did Australia introduce the ban?

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- To reduce harm caused by addictive design features and dangerous content.

## A 2025 government study found:

- 96% of 10–15-year-olds used social media
- 70% had seen harmful content (violence, misogyny, eating disorders, suicide)
- 1 in 7 experienced grooming-type behaviour
- Over 50% had been cyber bullied

## Which platforms are covered?

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### 10 platforms included:

- |             |               |          |
|-------------|---------------|----------|
| • Facebook  | • TikTok      | • Kick   |
| • Instagram | • X (Twitter) | • Twitch |
| • Snapchat  | • YouTube     |          |
| • Threads   | • Reddit      |          |

### Platforms NOT included:

- YouTube Kids
- Google Classroom
- WhatsApp
- **Reason:** They do not meet criteria for social interaction and content posting.

## How does the government decide what's included?

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### Platforms are assessed on whether they:

- Enable social interaction between users
- Allow users to interact with others
- Allow users to post content

### What can under-16s still do?

- View most online content without logging in
- Use non-covered services (e.g. messaging apps and educational tools)

### How is the ban enforced?

- Children and parents are not punished
- Social media companies face fines up to A\$49.5 million

### Companies must take “reasonable steps” using:

- Government ID
- Facial or voice recognition
- Age-inference technology
- Self-certification or parental approval is not allowed

## What are the concerns about enforcement?

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### Age-verification tools may:

- Wrongly block adults
- Fail to detect under-16s
- Facial recognition is least reliable for teenagers
- Fines may be too small for big tech companies

### Risk of:

- Fake accounts
- Shared parent-child accounts
- Increased VPN use
- Privacy and data protection concerns
- Large-scale collection of sensitive data raises fears
- Australia has a history of major data breaches

### Government says:

- Data must be used only for age checks
- Data must be deleted afterward
- Heavy penalties apply for misuse
- Criticism of the ban

### Limited scope:

- Gaming platforms (Roblox, Discord) excluded
- Dating sites excluded
- AI chatbots not covered
- Some argue education and digital literacy would work better
- Fear children may move to less regulated online spaces

## How have social media companies responded?

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- Most platforms oppose the ban but will comply

### Key reactions:

- **Meta:** Closing teen accounts, warned of inconsistent protections
- **Snapchat:** Age verification via ID, bank account or selfies
- **YouTube:** Warned ban could make children less safe
- **Reddit:** Expressed deep concerns about free expression and privacy
- Some companies considered or discussed legal action

### Will the ban work?

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- Government admits it won't be perfect
- Enforcement and circumvention remain major challenges



### Success depends on:

- Effectiveness of age-verification
- Platform compliance
- Ongoing monitoring and updates

### How does Australia compare globally?

- **Denmark:** Planning ban for under-15s
- **Norway:** Considering similar measures
- **France:** Proposed under-15 ban + curfews for older teens
- **Spain:** Parental authorisation for under-16s
- **UK:** Heavy fines and jail risk for executives under new safety laws
- **USA:** Similar bans blocked by courts

### QUESTIONS

16. With reference to **Australia's ban on social media use by children**, consider the following statements:
1. Australia has introduced a nationwide ban on children below 16 years from using major social media platforms.
  2. Under the ban, children and parents can be penalised for violations, including monetary fines.
  3. The ban applies only to platforms that enable social interaction and allow users to post content.

Which of the statements given above are correct?

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

17. Consider the following statements regarding the **enforcement and scope of Australia's social media ban**:
1. Platforms such as WhatsApp, Google Classroom and YouTube Kids are excluded from the ban.
  2. Self-certification and parental approval are permitted methods for age verification under the new law.
  3. Social media companies are required to use age-verification tools such as government ID or biometric technologies.

Which of the statements given above are correct?

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

18. With reference to the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 and their amendments**, consider the following statements:
1. The amended IT Rules impose a legal obligation on intermediaries to make reasonable efforts to prevent users from uploading unlawful content.
  2. The amendments require intermediaries to respect users' fundamental rights under Articles 14, 19 and 21 of the Indian Constitution.

3. The determination of whether online content is defamatory or libellous is to be made solely by intermediaries under the amended rules.

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

**19. Consider the following statements regarding the Grievance Redressal framework under the IT Rules, 2021:**

1. The IT Rules mandate the appointment of a Grievance Officer by social media intermediaries.
2. Grievance Appellate Committees allow users to appeal against decisions or inaction of intermediaries.
3. Once a Grievance Appellate Committee decides a matter, users cannot approach courts for further remedy.

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

**20. With reference to the 2023 amendments introducing a Fact Check Unit under the IT Rules, consider the following statements:**

1. The amendments empower the Union government to identify online information as false or misleading through a Fact Check Unit.
2. Failure of intermediaries to act on content flagged by the Fact Check Unit may result in the loss of safe harbour protection under the IT Act, 2000.
3. Fake news is explicitly listed as a ground for restricting freedom of speech under Article 19(2) of the Constitution.

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

## 5. Satya Nadella launches AI-powered tool for Maharashtra police

### MahaCrimeOS AI

- AI-powered investigation platform developed jointly by Microsoft and Maharashtra Government.
- Extends next-generation cybercrime and investigative tools to all 1,100 police stations in Maharashtra.
- Built on Microsoft Foundry with AI Copilot capabilities.



- Developed in collaboration with MARVEL (Maharashtra Research and Vigilance for Enhanced Law Enforcement) and Microsoft partner CyberEye.

### Purpose and Significance

- Enhances efficiency in crime investigation, especially in cybercrime and complex cases.
- Automates routine tasks, enabling officers to focus on critical investigative work.
- Supports compliance with state police protocols and judicial guidelines.
- Ensures accessibility by providing Marathi language interface for easy adoption.

### MARVEL & AI Integration

#### MARVEL:

- Government-owned AI initiative set up in 2024 to modernize policing.
- Collaborates with global tech leaders to create AI Copilots for law enforcement.
- MOU signed with Microsoft to establish three AI Centres of Excellence.
- Fine-tunes MahaCrimeOS AI to meet state investigation protocols and provide Marathi support.

### Key Features of MahaCrimeOS AI

- **Multimodal input processing:** Handles PDFs, audio, handwritten notes, images in any language.
- **Automated investigation plans:** Generates case-specific plans based on police and judicial guidelines.
- **Data analysis & profiling:** Analyses telecom data, open-source intelligence (OSINT), social media links.
- **Workflow automation:** Suggests investigation steps, statements to record, bank accounts to freeze, social media to monitor.
- **Court-ready documentation:** Prepares time-stamped case diaries and legal documentation automatically.
- **Ease of use:** Designed in Marathi, usable even by constables for drafting letters and routine tasks.





## Impact on Policing

- **Pilot in Nagpur Rural:** Deployed across 25 police stations, used in 261 cases so far.
- Accelerates complex investigations in narcotics, cybercrime, crimes against women, financial fraud.
- Reduces dependency on specialist officers and travel to headquarters.
- Shortens investigation periods, helping meet deadlines under Bharatiya Nyaya Sanhita (BNS).

## Example cases:

- Bank fraud of Rs. 38 lakh solved using telecom and OSINT analysis.
- Jio tower land fraud case resolved by tracing suspects across states.



## Technology & Security

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- Built using Azure OpenAI Service in Microsoft Foundry.
- Secured with Microsoft Defender for Cloud.
- Integrates India's criminal laws for accurate case handling.
- Adapts best-practice protocols to specific crimes for tailored investigation plans.

## Future Plans

- Expand to all 1,100 police stations statewide.
- Develop models for additional crime categories beyond the initial four.
- Strengthen AI capabilities to further improve crime prediction, intelligence gathering, and investigation efficiency.

## AI Future

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### Ubiquitous Automation

- AI will increasingly handle repetitive or complex tasks across industries—healthcare, finance, logistics, and manufacturing.
- Expect smarter robotics and autonomous systems in everyday life, from self-driving cars to smart factories.

### Healthcare Revolution

- **Personalized medicine:** AI can predict diseases, suggest treatments, and help in drug discovery.
- Remote monitoring and diagnostics may become more accurate with AI analyzing patient data in real-time.

### Enhanced Creativity

- AI tools can collaborate with humans in art, music, and writing.
- New forms of entertainment, interactive media, and generative design will emerge.

### Improved Decision-Making

- AI will help governments, businesses, and individuals make data-driven decisions.
- Predictive analytics can optimize supply chains, energy usage, and resource allocation.

### Human-AI Symbiosis

- Future AI may act as cognitive assistants, helping humans think, plan, and solve problems.
- Integration with AR/VR could make AI-guided experiences immersive and interactive.

## Current Shortcomings

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### Bias and Fairness

- AI reflects the biases present in training data.
- This can lead to unfair or discriminatory outcomes in hiring, policing, and lending.

### Lack of True Understanding

- AI does not “understand” like humans; it recognizes patterns and correlations.
- It can produce plausible-sounding but incorrect information (hallucinations).

## Data Dependency

- AI requires massive, high-quality datasets to perform well.
- Limited or poor-quality data leads to poor performance.

## Energy and Environmental Costs

- Training large models consumes huge amounts of electricity.
- This raises sustainability concerns.

## Ethical and Security Risks

- Misuse of AI for deepfakes, cyberattacks, surveillance, and autonomous weapons is a growing concern.
- Accountability and transparency in AI decisions remain challenging.

## Job Displacement

- Automation may replace certain human jobs faster than new ones are created.
- The economic and social impacts need careful management.

## QUESTIONS

21. With reference to **MahaCrimeOS AI**, recently launched for the Maharashtra Police, consider the following statements:

1. MahaCrimeOS AI is an AI-powered investigation platform jointly developed by Microsoft and the Government of Maharashtra.
2. It is built on Microsoft Foundry using AI Copilot capabilities and supports multimodal inputs such as audio, images, and handwritten notes.
3. The platform is designed exclusively for senior police officers and does not support regional language interfaces.

Which of the statements given above are correct?

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

22. Consider the following statements regarding the **role and impact of AI in policing and governance**, as reflected in the MahaCrimeOS AI initiative:

1. MARVEL is a government-owned AI initiative established to modernize policing through collaboration with global technology firms.
2. MahaCrimeOS AI assists in automated case diary preparation and compliance with judicial and police investigation guidelines.
3. The use of AI in policing completely eliminates concerns related to bias, data dependency, and ethical accountability.

Which of the statements given above are correct?

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

23. In India, it is legally mandatory for which of the following to report on cyber security incidents?

1. Service providers
2. Data centres
3. Body corporate

Select the correct answer using the code given below:

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

## 6. ACS Supriya Sahu of Tamil Nadu Wins UNEP 2025 Champions of the Earth Award

- The Additional Chief Secretary of the Department of Environment, Climate Change and Forests of Tamil Nadu, Ms Supriya Sahu, has won the UN Environment Programme's 2025 Champions of the Earth Award.
- She is one of the climate forerunners tackling some of the most urgent challenges.
- According to UNEP, Ms Sahu has been chosen for her inspiration and action.
- Ms Sahu took various initiatives to showcase how integrated governance and nature-based solutions, along with a mix of low and high-tech interventions, can protect vulnerable communities while reducing greenhouse gas emissions.



### What the Award is

- Champions of the Earth are UNEP's flagship environmental recognition, established in 2005 to acknowledge individuals, organizations, and governments whose work has had a transformative impact on the environment.
- It celebrates leadership, innovation, and solutions addressing climate change, biodiversity loss, pollution, and sustainable development.



### 2025 Champions of the Earth Laureates

- In December 2025, UNEP announced five laureates — each excelling in different areas of climate and environmental action:

## 1. Pacific Island Students Fighting Climate Change

### Policy Leadership:

- A youth-led NGO that secured a landmark legal opinion from the International Court of Justice affirming states' legal obligations to prevent climate harm and protect human rights, advancing climate justice for vulnerable nations.

## 2. Supriya Sahu (India)

- Additional Chief Secretary, Government of Tamil Nadu — recognized for pioneering sustainable cooling, ecosystem restoration and climate resilience efforts that have benefitted millions, created green jobs, and expanded forest cover.

## 3. Mariam Issoufou (Niger / France)

- **Entrepreneurial Vision:** Founder of Mariam Issoufou Architects, noted for using local materials and passive cooling design to create sustainable, resilient buildings in the Sahel.

## 4. Imazon (Brazil)

- **Science and Innovation:** A research institute using AI and geospatial science to curb deforestation and strengthen forest governance in the Amazon basin.

## 5. Manfredi Caltagirone (posthumous)

- **Lifetime Achievement:** Honored for leadership in advancing methane emissions transparency and science-based policy, shaping major regulations and global energy practices.

### Prize Focus & Categories

- The 2025 awards spotlight leadership and innovation in climate justice, methane mitigation, sustainable cooling, resilient buildings, and forest conservation — all critical to achieving climate and environmental goals.
- Champions are typically recognized across key categories such as:
  - Policy Leadership
  - Inspiration and Action
  - Entrepreneurial Vision
  - Science and Innovation
  - Lifetime Achievement

### Young Champions of the Earth (2025)

- Alongside the main award, UNEP also highlights Young Champions of the Earth; a program for emerging environmental innovators aged 18–30.
- The 2025 Young Champions include:
  - **Jinali Pranabh Mody (India)** — Founder & CEO of Banofi Leather, which turns banana crop waste into sustainable plant-based leather.
  - **Joseph Nguthiru (Kenya)** — Founder of HyaPak, producing biodegradable packaging from invasive water hyacinth.
  - **Noemi Florea (USA)** — Creator of Cycleau, a compact system that turns greywater into potable water.



## QUESTIONS

24. With reference to the **UNEP Champions of the Earth Award**, consider the following statements:

1. The Champions of the Earth Award is the flagship environmental recognition instituted by the United Nations Environment Programme in 2005.
2. The award recognises only governments for their contribution to climate change mitigation and biodiversity conservation.

Which of the statements given above is/are correct?

- A. 1 only  
B. 2 only  
C. Both 1 and 2  
D. Neither 1 nor 2

25. With reference to the **UNEP Champions of the Earth Award 2025**, consider the following statements:

1. **Ms Supriya Sahu** was recognised for promoting integrated governance and nature-based solutions to enhance climate resilience and reduce greenhouse gas emissions.
2. Prime Minister Narendra Modi was a recipient of the United Nations' highest environmental honor, the "Champions of the Earth Award," in 2018.
3. Jinali Pranabh Mody of India won the prestigious UNEP Young Champions of the Earth Award for 2025 for her innovative startup, Banofi Leather, which creates sustainable, plant-based leather from banana crop waste.

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

## 7. Viksit Bharat - Guarantee for Rozgar and Aajeevika Mission (Gramin): VB G RAM G

### 1. Introduction & Legislative Overview

- Introduced in the Lok Sabha by Union Minister Shri Shivraj Singh Chouhan.
- Titled Viksit Bharat – Guarantee for Rozgar and Aajeevika Mission (Gramin): VB G RAM G Bill, 2025.
- Aligned with the national vision of Viksit Bharat @2047.
- Seeks to establish a future-ready, convergence-driven and saturation-oriented rural development framework.

### 2. Core Objective of the Bill

- Provide a statutory guarantee of 125 days of wage employment per rural household per financial year.
- Employment to adult members volunteering for unskilled manual work.
- Empower rural households through:
  - Enhanced employment opportunities.

# VB—G RAM G Bill at a glance

A look at the key provisions of the **Viksit Bharat—Guarantee for Rozgar and Ajeevika Mission (Gramin)** or **VB—G RAM G Bill, 2025**, being brought by the Centre to replace the Mahatma Gandhi National Rural Employment Guarantee Act, or MGNREGA:

## What's the bill?

VB—G RAM G Bill, 2025 proposes to establish a modern statutory framework aligned with Viksit Bharat 2047, guaranteeing 125 days of employment per rural household whose adult members volunteer to do unskilled manual work.

## What makes it better than MGNREGA?

- The new bill represents a major upgrade over MGNREGA, fixing structural weaknesses while enhancing employment, transparency, planning, and accountability.
- It proposes guaranteed 125 days of wage employment a year, up from 100 days under MGNREGA, giving rural households higher income security.
- While MGNREGA works were scattered across many categories, the new bill focuses on four major types of works: ensuring durable assets that directly support water security, core rural infrastructure, livelihood-related infrastructure creation and climate adaptation.

## How will it benefit...

### The rural economy?

- It aims to strengthen rural economy by productive asset creation, higher incomes, and better resilience.
- It seeks to improve water security, core rural infra, livelihood infra, climate resilience, higher employment and consumption, and reduced distress migration.

### The Farmers?

- The bill mandates 60 days of no-work during peak sowing/harvesting period, preventing labour shortages during critical farm operations.
- It also prioritises water works to improve irrigation, groundwater and multi-season cropping potential.

### The Labourers?

- The guaranteed 125 days of wage work means 25% more potential earnings than MGNREGA.
- The bill also mandates states to pay unemployment allowance if no work is provided to an applicant.



## Why shift to normative funding?

- A demand-based model leads to unpredictable allocations and mismatched budgeting. Normative funding uses objective parameters, ensuring predictable, rational planning while still guaranteeing that every eligible worker receives employment or unemployment allowance.

## What transparency measures are built into the new bill?

- AI-based fraud detection; central and state steering panels for oversight; focus on four key verticals for rural development; enhanced monitoring role for panchayats; GPS/mobile-based monitoring; real-time MIS dashboards; weekly disclosures; and stronger social audits.

## Will cost sharing burden states financially?

- No. The structure is balanced and sensitive to state capacity. It will be 60:40 (Centre: state) for all states, except Northeastern and Himalayan states as well as UTs
- States can seek extra support during disasters.

## What happens to workers during the no-work period?

- Workers shift to agriculture, which pays higher seasonal wages, benefitting both farmers and labourers.
- 60 days is aggregated, not continuous, and workers still get 125 guaranteed days in the remaining ~300 days.



- Sustainable livelihood creation.
- Resilient and productive rural infrastructure.

### 3. Key Features of Wage Employment Guarantee

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**Enhanced employment guarantee: Increased from 100 days to 125 days**

**Unemployment allowance:**

- Payable if employment is not provided within 15 days.
- To be borne by State Governments.

**Wage rates:**

- To be notified by the Central Government.
- Existing MGNREGA wage rates applicable until new notification.

### 4. Unified Rural Infrastructure Framework

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- All works aggregated under the Viksit Bharat National Rural Infrastructure Stack.
- Creation of durable, productive and climate-resilient assets.

**Priority sectors:**

- Water security and water-related works
- Core rural infrastructure
- Livelihood-supporting infrastructure
- Disaster preparedness and climate resilience works

### 5. Planning through Viksit Gram Panchayat Plans (VGPPs)

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**VGPPs aggregated at:**

- Block level
- District level
- State level

**Integration with:**

- Spatial technology
- PM Gati Shakti for coordinated infrastructure planning
- Enables a Whole-of-Government rural development approach

### 6. Flexibility for Agricultural Seasons

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**States empowered to notify up to 60 days per financial year**

**During these periods, works may be suspended to:**

- Ensure availability of farm labour
- Support peak sowing and harvesting seasons

### 7. Funding & Implementation Framework

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**Operates as a Centrally Sponsored Scheme (CSS)**

**Fund sharing pattern:**

- 90:10 – North-Eastern & Himalayan States/UTs
- 60:40 – All other States

**States required to:**

- Prepare and notify their implementation Scheme within 6 months of Act commencement

## 8. Normative & Equitable Fund Allocation

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### Normative allocation to States based on objective parameters

#### Transparent and need-based intra-State distribution

- **Allocation across:**
  - Districts
  - Gram Panchayats
- **Focus on:**
  - Panchayat category
  - Local developmental needs
  - Strengthens equity, transparency and accountability

## 9. Digital Governance & Transparency Measures

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### Comprehensive Digital Public Infrastructure (DPI) framework:

- Biometric authentication
- Spatial-tech enabled monitoring
- Mobile-based real-time reporting dashboards
- AI-enabled analytics
- Strengthened social audit mechanisms
- High-integrity and technology-driven implementation

## 10. Grassroots Transparency & Public Accountability

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### Weekly Disclosure Meetings at Gram Panchayat Bhavans

#### Mandatory public sharing of:

- Work status
- Payments
- Muster rolls
- Grievances and redressal
- Physical and financial progress

#### Disclosures available in:

- Physical formats
- Digitally accessible platforms

## 11. Background & Rationale for Reform

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### Significant rural transformation over two decades:

- Saturation of basic amenities
- Improved connectivity and infrastructure
- Digital and financial inclusion
- Workforce diversification
- Rising rural aspirations

#### Need for:

- Stronger convergence across schemes
- Fair and objective resource distribution
- Transition from fragmented to integrated rural development

## 12. Vision for Viksit Bharat @2047

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### Anchors rural development in:

- Employment-led asset creation
- Climate resilience
- Positions rural India as a key driver of national transformation
- Empowers rural households while accelerating India's journey towards Viksit Bharat @2047
- Technology-driven governance
- Inclusive and equitable growth

## QUESTIONS

26. With reference to the **Viksit Bharat – Guarantee for Rozgar and Ajeevika Mission (Gramin) Bill, 2025**, consider the following statements:

1. The Bill provides a statutory guarantee of 125 days of wage employment per rural household per financial year.
2. The wage employment under the Bill is restricted only to skilled rural workers.
3. Unemployment allowance under the Bill is payable if employment is not provided within 15 days.

Which of the statements given above is/are correct?

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

27. Consider the following statements regarding the **funding and implementation framework** of the VB G-RAM-G Bill, 2025:

1. The scheme operates as a Centrally Sponsored Scheme.
2. The Centre–State funding pattern is uniform across all States.
3. States are required to notify their implementation scheme within six months of the Act's commencement.

Which of the statements given above is/are correct?

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

28. With reference to **planning and asset creation** under the VB G-RAM-G framework, consider the following statements:

1. All works are aggregated under a National Rural Infrastructure Stack.
2. Priority is given to water security, livelihood-supporting infrastructure, and climate resilience works.
3. Planning is carried out exclusively at the Central Government level.

Which of the statements given above is/are correct?

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

29. Consider the following statements regarding **governance and transparency mechanisms** under the VB G-RAM-G Bill, 2025:

1. The Bill mandates weekly disclosure meetings at Gram Panchayat Bhavans.
2. Digital governance measures include biometric authentication and AI-enabled analytics.
3. Social audits have been discontinued due to digital monitoring.

Which of the statements given above is/are correct?

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



30. With reference to **Viksit Gram Panchayat Plans (VGPPs)** under the proposed rural development framework, consider the following statements:
1. VGPPs are aggregated at the Block, District, and State levels.
  2. VGPPs integrate spatial technology and PM Gati Shakti for coordinated infrastructure planning.
  3. States are empowered to suspend works for up to 60 days in a financial year to support peak agricultural seasons.
- 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
31. Among the following, who are eligible to benefit from the **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)**?
- A. Adult members of only the Scheduled Caste and Scheduled Tribe households  
B. Adult members of Below Poverty Line (BPL) households only  
C. Adult members of households of all backward communities only  
D. Adult members of any rural household

## 8. The Indian Ocean as cradle of a new blue economy

### 1. Historic Foundations of India's Ocean Leadership

- During UNCLOS negotiations (1970s–80s), India aligned with small and vulnerable island states.
- Championed the principle of the seabed beyond national jurisdiction as the “common heritage of mankind.”
- Jawaharlal Nehru (1950s) recognised oceans as central to India's security and prosperity.
- Established India's identity as a maritime nation guided by fairness and equity.

### 2. The Indian Ocean at a Critical Juncture

- Home to one-third of humanity and among the most climate-vulnerable regions.



- **Facing unprecedented pressures:**
  - Climate change, warming and acidifying seas
  - Rising sea levels
  - Illegal, unreported and unregulated (IUU) fishing
  - Ecosystem degradation and biodiversity loss
- Ocean insecurity increasingly driven by environmental and climate stresses.

### 3. India's Opportunity for Renewed Leadership

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- **Shift required:** from drafting global norms to shaping regional practice.
- **Vision:** Indian Ocean as a laboratory of sustainability, resilience, and innovation, not rivalry.
- Leadership rooted in cooperation, inclusivity, and responsibility.

### 4. India's Blue Ocean Strategy: Three Core Pillars

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#### a. Stewardship of the Commons

- Promote ecosystem restoration and biodiversity protection.
- Advocate sustainable fisheries and cooperative ocean governance.
- Reinforce the Indian Ocean as a shared space, not a contested one.

#### b. Resilience and Adaptation

- Address climate impacts through preparedness and innovation.

#### Establish a Regional Resilience and Ocean Innovation Hub:

- Ocean observation systems
- Early warning and disaster response
- Technology transfer to SIDS and African coastal nations

#### c. Inclusive Blue Growth

---

#### Unlock sustainable economic opportunities:

- Green shipping
- Offshore renewable energy
- Sustainable aquaculture
- Marine biotechnology
- Ensure growth benefits all littoral states through coordinated regional action.

### 5. Ocean Finance: A Turning Tide

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#### BEFF Monaco (June 2025):

- €25 billion existing ocean investment pipeline
- €8.7 billion in new commitments

#### Finance in Common Ocean Coalition:

- \$7.5 billion annually from 20 public development banks

#### COP30 Belém:

- One Ocean Partnership launched
- \$20 billion mobilised for ocean action by 2030
- **Clear signal:** oceans are now central to global climate finance.

## 6. India's Role in Mobilising Blue Finance

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### Proposal for an Indian Ocean Blue Fund:

#### Seeded by India

- Open to development banks, philanthropy, and private sector
- **Purpose:** convert global pledges into regionally relevant projects.

## 7. Security through Sustainability

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- Traditional maritime security insufficient without ecological stability.
- Environmental degradation undermines livelihoods and social cohesion.
- Shift toward “security through sustainability.”

### SAGAR doctrine (2015):

- Indian Ocean as a zone of peace, stability, and prosperity.

### Role of Indian Navy and Coast Guard:

- Maritime domain awareness
- Disaster response
- Ecosystem monitoring

### Narrative focus:

- Responsibility over rivalry
- Stewardship over dominance

## 8. Global Momentum and India's Historic Responsibility

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- Enduring relevance of Indira Gandhi's 1972 warning on environment and poverty.

### Global milestones:

#### UNOC3 (Nice)

- **COP30 (Belém)**
  - Entry into force of the BBNJ Agreement
  - 2026 shaping up as a pivotal year for ocean governance.
- **India's ratification of BBNJ can showcase:**
  - Green shipping corridors

### Blue bonds

- Inclusive marine technology transfer
- Responsible ocean-based carbon removal
- Opportunity to lead through IORA chairmanship.

## 9. A Vision for the Future: “From the Indian Ocean, for the World”

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### Indian Ocean as cradle of a new blue economy:

- Prosperity aligned with sustainability
- Resilience anchored in justice and equity

### Core challenge:

- Move beyond rhetoric
- Align vision with finance
- Build enduring partnerships
- The ocean is not a frontier to conquer, but the foundation of life.

### Green shipping corridors

- Green shipping corridors are designated maritime routes where ships, ports, fuel suppliers, and regulators collaborate to cut greenhouse-gas emissions to near zero through coordinated deployment of clean technologies and fuels.

### Key elements

- **Low/zero-carbon fuels:** green methanol, ammonia, hydrogen, sustainable biofuels.
- **Port infrastructure:** bunkering for new fuels, shore power (cold ironing), digital port calls.
- **Clean vessels:** energy-efficient designs, wind-assist, hybrid/electric systems.
- **Policy & finance:** aligned regulations, demand guarantees, carbon pricing, green premiums.
- **Data & coordination:** shared standards, emissions tracking, synchronized investments.

### Why they matter

- Accelerate decarbonization on real trade lanes.
- De-risk first-of-a-kind investments by concentrating demand and supply.
- Create replicable models for global scale-up.

### Examples (illustrative)

- Transpacific routes (Asia–US West Coast)
- Europe–Asia corridors
- Northern Europe short-sea corridors

### Challenges

- High cost and limited supply of green fuels
- Safety and standards for new fuels (*e.g.*, ammonia)
- Port readiness and global regulatory alignment

## QUESTIONS

32. With reference to **India's historical role in ocean governance**, consider the following statements:
1. During the UNCLOS negotiations, India supported the principle that the seabed beyond national jurisdiction is the common heritage of mankind.
  2. India aligned itself with small and vulnerable island states during early global ocean negotiations.
- Which of the statements given above are correct?
- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2



33. With reference to the **emerging global blue economy and ocean finance**, consider the following statements:

1. Recent global initiatives indicate that oceans have become central to climate finance.
2. BEFF Monaco 2025 announced new ocean investment commitments exceeding €8 billion.
3. India has already operationalised an Indian Ocean Blue Fund with compulsory contributions from littoral states.

Which of the statements given above are correct?

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

34. With reference to **green shipping corridors and India's maritime security approach**, consider the following statements:

1. Green shipping corridors aim to reduce emissions to near zero through coordinated deployment of clean fuels and port infrastructure.
2. India's SAGAR doctrine emphasises maritime dominance as the primary goal of Indian Ocean security.
3. Environmental degradation in the Indian Ocean can undermine livelihoods and social cohesion, affecting regional security.

Which of the statements given above are correct?

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



## ANSWER KEY AND EXPLANATION

### 1. C Only three

- Statements 1, 2, and 3 are correct. Perumbidugu Mutharaiyar II was a Pallava feudatory who exercised near-independent authority and whose dynasty declined after Vijayalaya Chola captured Thanjavur. Statement 4 is incorrect because Perumbidugu Mutharaiyar is believed to have ruled mainly from **Tiruchirappalli**, not Kanchipuram.

### 2. C Only three

- Statements 1, 2, and 4 are correct. The Mutharaiyars made significant contributions to early Dravidian architecture during the Pallava period, influencing later Chola temples. Statement 3 is incorrect because their architectural activity **predated** the rise of the Vijayalaya Cholas.

### 3. C Only three

- Statements 1, 2, and 3 are correct. Perumbidugu Mutharaiyar patronised Shaivism while maintaining an atmosphere of intellectual openness, allowing Jain Acharya Vimalachandra and others to engage in debates. Statement 4 is incorrect because the ruler is noted for **religious tolerance**, not suppression.

### 4. B It was built by Rajendra Chola.

- The **Brihadiswara Temple at Thanjavur** is one of the finest examples of **Chola architecture** and a UNESCO World Heritage Site.
- **Option (a) is correct.**  
The temple is dedicated to **Lord Shiva** and houses a massive Shiva Lingam in the sanctum.
- **Option (b) is not correct.**
  - The Brihadiswara Temple at **Thanjavur** was built by **Rajaraja Chola I** between **1003 and 1010 CE**.
  - His son **Rajendra Chola I** built a separate Brihadiswara (Brihadisvara) Temple at **Gangaikondacholapuram**, not the one at Thanjavur.
- **Option (c) is correct.**  
The temple complex features **two large gopuras**, and its architectural uniqueness lies in the **vimana (sanctum tower) being taller than the gopurams**, a hallmark of early Chola temple design.
- **Option (d) is correct.**  
The sanctum of the Brihadiswara Temple is **two-storeyed**, designed to house the massive deity and support the towering vimana above.

### 5. D Neither 1 nor 2

- Both statements accurately describe key features of **Chola administration**, as evidenced by inscriptions and historical records.
- **Statement 1 is correct.**  
The Chola king was the **supreme authority** in the state and exercised extensive powers over administration, justice, military, and revenue. However, he was assisted by a **Council of Ministers and officials** who advised him on governance and policy matters.
- **Statement 2 is correct.**  
The Cholas had a highly developed system of **local self-government**, especially at the village level. In Brahmadeya villages, the **sabha** managed local affairs through various committees (*variyams*).

As described in the **Uttaramerur inscriptions**, members of these committees were selected from among **educated property-owning individuals** using methods such as **drawing lots (kudavolai system)** or **rotation**.

- Since **both statements are correct**, none of them is incorrect.

**6. D** All four

- **Statement 1 is correct.**

In the Chola administrative system, the **nadu** was a key territorial unit consisting of a group of villages. Villages were the smallest administrative units, and several villages together formed a nadu.

- **Statement 2 is correct.**

The Chola Empire was divided into large provinces called **mandalams**. Within each mandalam, **valanadus** were formed, which in turn comprised several **nadus**, indicating a well-structured administrative hierarchy.

- **Statement 3 is correct.**

The **ur** was the general assembly of an ordinary village, composed of adult male residents. It managed local affairs such as irrigation, justice, and tax collection.

- **Statement 4 is correct.**

One of the most distinctive features of Chola administration was its **highly developed system of village self-government**. Institutions like **ur** (common villages) and **sabha** (Brahmadeya villages) exercised considerable autonomy, as evidenced by inscriptions such as those from **Uttaramerur**.

**7. B** Only two

- **Statement 1 is correct.** DHRUV64 is India's first homegrown 1.0 GHz, 64-bit dual-core architecture microprocessor.
- **Statement 2 is correct.** It has been developed by **C-DAC** under the **Microprocessor Development Programme (MDP)**.
- **Statement 3 is incorrect.** DHRUV64 supports **both strategic and commercial applications**, including 5G, automotive systems, consumer electronics, industrial automation, and IoT.

**8. C** Only three

- **Statements 1, 2 and 3 are correct.**
  - SHAKTI → strategic, space, defence
  - AJIT → industrial and robotics
  - VIKRAM → space-grade extreme conditions
- **Statement 4 is incorrect.** These processors are part of India's **indigenous RISC-V-based ecosystem**, not imported proprietary architectures.

**9. C** Only three

- **Statement 1 is correct.** Instruction processing follows the **fetch–decode–execute** cycle.
- **Statement 2 is correct.** ALU, Control Unit, Registers and Clock are core components.
- **Statement 3 is incorrect.** IoT data processing can occur at **edge devices, gateways, or cloud platforms**—not cloud-only.
- **Statement 4 is correct.** Indigenous processors like DHRUV64 reduce reliance on foreign semiconductor imports, especially as India consumes ~20% of global microprocessors.

10. C 1 and 3 only

- **Statement I is correct.**

The **Majorana 1 chip** is based on **Majorana fermions**, exotic particles that are expected to help build **fault-tolerant quantum computers**. Such chips are designed to support stable qubits, which are essential for practical quantum computing.

- **Statement II is incorrect.**

The **Majorana 1 chip** was introduced by **Microsoft**, not Amazon Web Services. Microsoft is pursuing this research under its **Azure Quantum** initiative.

- **Statement III is correct.**

**Deep learning** is indeed a **subset of machine learning**. It uses artificial neural networks with multiple layers to automatically learn patterns from large datasets, whereas machine learning is the broader field that includes several other approaches as well.

11. C Only two

- **Statement 1 is correct.** The Trump Gold Card provides residency, work rights, and a pathway to citizenship in exchange for payment.
- **Statement 2 is correct.** The programme explicitly **eliminates the job-creation requirement**, which was mandatory under the EB-5 visa.
- **Statement 3 is incorrect.** The contribution is treated as a **“gift” to the U.S. government**, not an investment in businesses.

12. B Only two

- **Statement 1 is correct.** Successful applicants receive **EB-1 or EB-2 status**, reserved for individuals of extraordinary ability or merit.
- **Statement 2 is incorrect.** The Trump Platinum Card allows residence **up to 270 days per year**, not unlimited stay.
- **Statement 3 is correct.** Under the Corporate Gold Card, **sponsorship can be transferred** to another employee.

13. B Only two

- **Statement 1 is correct.**

The H-1B visa is designed for **specialist occupations** such as IT, engineering, medicine, and research, requiring a **bachelor’s degree or higher**.

- **Statement 2 is correct.**

The United States issues **85,000 H-1B visas annually**, including **65,000 regular visas** and **20,000 reserved for applicants with U.S. advanced degrees**.

- **Statement 3 is incorrect.**

H-1B visas are **not issued on a first-come-first-served basis**. When applications exceed the cap, selection is done through a **lottery system**.

14. B Only two

- **Statement 1 is correct.**

The H-1B visa programme was introduced under the **Immigration Act of 1990** to allow U.S. employers to hire foreign workers in **specialty occupations** requiring higher education and specialised skills.



- **Statement 2 is incorrect.**

The U.S. government clarified that the **USD 100,000 fee is a one-time payment**, applicable **only to new H-1B petitions filed on or after September 21, 2025**, and **not an annual recurring fee** nor applicable to existing visa holders.

- **Statement 3 is correct.**

**Indian professionals receive over 70% of all H-1B visas**, reflecting India's dominant role in supplying skilled labour to the U.S. technology and services sectors.

**15. B** Only two

- **Statement 1 is correct.**

India and the United States are among the world's largest **representative democracies**, where citizens exercise sovereignty through elected representatives rather than direct participation in governance.

- **Statement 2 is correct.**

India follows a **parliamentary system**, where the executive is drawn from and accountable to the legislature, whereas the United States follows a **presidential system**, with a clear separation of powers.

- **Statement 3 is incorrect.**

In the **United States**, the President is elected indirectly through the **Electoral College**, while in **India**, the Prime Minister is not directly elected by the people but chosen from the majority in the Lok Sabha.

**16. B** Only two

- **Statement 1 is correct.**

Australia has implemented the world's **first national ban** prohibiting under-16s from accessing major social media platforms, including account creation and continued use.

- **Statement 2 is incorrect.**

**Children and parents are not punished** under the law. Instead, **social media companies face penalties**, with fines of up to **A\$49.5 million** for non-compliance.

- **Statement 3 is correct.**

Platforms are included in the ban based on whether they **enable social interaction, allow user-to-user engagement, and permit content posting**.

**17. B** Only two

- **Statement 1 is correct.**

Services like **WhatsApp, Google Classroom and YouTube Kids** are excluded because they do not meet the criteria of social networking platforms involving public interaction and content posting.

- **Statement 2 is incorrect.**

The law **does not allow self-certification or parental consent** as valid age-verification mechanisms.

- **Statement 3 is correct.**

Platforms must take "reasonable steps" for enforcement using tools such as **government ID verification, facial or voice recognition, and age-inference technologies**.

18. A 1 and 2 only

- **Statement 1 is correct.**

The amendments move beyond a mere “informing” role and impose a **positive obligation** on intermediaries to take reasonable efforts to prevent the hosting of unlawful content.

- **Statement 2 is correct.**

Intermediaries are explicitly required to respect **Articles 14, 19 and 21**, ensuring due diligence, transparency and privacy protections.

- **Statement 3 is incorrect.**

The amended rules **remove “defamatory” and “libellous” from Rule 3(1)(b)**, making it clear that such determinations must be made through **judicial review**, not by intermediaries.

19. A 1 and 2 only

- **Statement 1 is correct.**

The IT Rules require intermediaries to establish a **grievance redressal mechanism**, headed by a Grievance Officer.

- **Statement 2 is correct.**

The amendments provide for **Grievance Appellate Committees**, enabling users to appeal against the platform’s decisions or failure to act.

- **Statement 3 is incorrect.**

Users **retain the right to approach courts** for legal remedies; the appellate mechanism does not bar judicial review.

20. A 1 and 2 only

- **Statement 1 is correct.**

The 2023 amendments grant MeitY the power to establish a **Fact Check Unit** to identify false or misleading online content.

- **Statement 2 is correct.**

Intermediaries that fail to prevent or remove flagged content risk losing **Section 79 safe harbour immunity**, exposing them to legal liability.

- **Statement 3 is incorrect.**

**Fake news is not explicitly mentioned** as a ground for reasonable restriction under **Article 19(2)**; restrictions must be justified within the existing constitutional grounds.

21. A 1 and 2 only

- **Statement 1 is correct.**

MahaCrimeOS AI is jointly developed by **Microsoft and the Maharashtra Government**, in collaboration with MARVEL and CyberEye.

- **Statement 2 is correct.**

The platform is built on **Microsoft Foundry with AI Copilot**, and it can process **multimodal inputs** such as PDFs, audio files, images, handwritten notes, and content in multiple languages.

- **Statement 3 is incorrect.**

MahaCrimeOS AI explicitly provides a **Marathi language interface** and is designed for use even by **constables**, not just senior officers.

22. A 1 and 2 only

- **Statement 1 is correct.**

**MARVEL (Maharashtra Research and Vigilance for Enhanced Law Enforcement)** is a government-owned initiative launched in 2024 to integrate AI into policing, including through partnerships with firms like Microsoft.

- **Statement 2 is correct.**

MahaCrimeOS AI prepares **court-ready, time-stamped case diaries**, automates investigation plans, and ensures adherence to **judicial and police protocols**, including timelines under the Bharatiya Nyaya Sanhita (BNS).

- **Statement 3 is incorrect.**

AI systems continue to face challenges related to **bias, data quality, ethical accountability, and misuse**, especially in sensitive areas such as policing and surveillance.

23. D 1, 2 and 3

- Under **Section 70B of the Information Technology Act, 2000**, the Union Government is empowered to designate a national agency for responding to cyber security incidents. Accordingly, the Government established **Indian Computer Emergency Response Team (CERT-In)** as the nodal agency.
- Further, as per the **CERT-In Rules, 2014**, particularly **Rule 12(1)(a)**, it is **mandatory** for the following entities to report cyber security incidents to CERT-In **within a reasonable time of occurrence**:
  - **Service providers**
  - **Intermediaries**
  - **Data centres**
  - **Body corporates**
- Since all three categories mentioned in the question—service providers, data centres, and body corporates—are explicitly covered under the reporting obligations, **all statements are correct**.

24. A 1 only

- **Statement 1 is correct.** The **Champions of the Earth Award** is UNEP's flagship environmental honour, established in **2005**, to recognise transformative environmental leadership.
- **Statement 2 is incorrect.** The award recognises **individuals, organisations, governments, youth groups, and institutions**, not governments alone, across multiple categories such as policy leadership, innovation, and inspiration.

25. D 1, 2 and 3

- **Statement 1 is correct.** UNEP recognised Ms Supriya Sahu for demonstrating how **integrated governance, nature-based solutions, and a blend of low- and high-tech interventions** can protect vulnerable communities while reducing emissions. She was recognised under **Inspiration and Action / Policy Leadership-oriented contributions**.
- **Statement 2 is correct.** Prime Minister Narendra Modi was a recipient of the United Nations' highest environmental honor, the "**Champions of the Earth Award**," in 2018.
- **Statement 3 is correct.** Jinali Pranabh Mody of India won the prestigious UNEP Young Champions of the Earth Award for 2025 for her innovative startup, Banofi Leather, which creates sustainable, plant-based leather from banana crop waste, offering a greener alternative to traditional leather.

26. A 1 and 3 only

- **Statement 1 is correct.** The Bill increases the statutory employment guarantee from 100 days (as under MGNREGA) to **125 days per rural household**.
- **Statement 2 is incorrect.** Employment is provided to **adult members volunteering for unskilled manual work**, not restricted to skilled workers.
- **Statement 3 is correct.** If employment is not provided within **15 days**, an **unemployment allowance** becomes payable.

27. B 1 and 3 only

- **Statement 1 is correct.** The Bill clearly specifies that VB G-RAM-G will function as a **Centrally Sponsored Scheme (CSS)**.
- **Statement 2 is incorrect.** The funding pattern is **not uniform**:
  - **90:10** for North-Eastern and Himalayan States/UTs
  - **60:40** for other States
- **Statement 3 is correct.** States must prepare and notify their own implementation schemes **within six months** of the Act coming into force.

28. A 1 and 2 only

- **Statement 1 is correct.** The Bill aggregates all works under the **Viksit Bharat National Rural Infrastructure Stack** to ensure convergence and durability.
- **Statement 2 is correct.** Priority sectors include **water security, core rural infrastructure, livelihood-supporting assets, and disaster/climate resilience works**.
- **Statement 3 is incorrect.** Planning begins at the **Gram Panchayat level** through **Viksit Gram Panchayat Plans (VGPPs)** and is aggregated upward.

29. B 1 and 2 only

- **Statement 1 is correct.** Weekly disclosure meetings at **Gram Panchayat Bhavans** are mandatory for public accountability.
- **Statement 2 is correct.** The Bill introduces a comprehensive **Digital Public Infrastructure (DPI)** framework including **biometric authentication, spatial monitoring, dashboards, and AI analytics**.
- **Statement 3 is incorrect.** **Social audit mechanisms are strengthened**, not discontinued.

30. D 1, 2 and 3

- **Statement 1 is correct:** Viksit Gram Panchayat Plans (VGPPs) are prepared at the Gram Panchayat level and then **aggregated at Block, District, and State levels** for integrated planning.
- **Statement 2 is correct:** VGPPs are **integrated with spatial technology and PM Gati Shakti**, enabling coordinated infrastructure development through a Whole-of-Government approach.
- **Statement 3 is correct:** States are empowered to **notify up to 60 days per financial year** during which works may be suspended to ensure the availability of agricultural labour during peak sowing and harvesting seasons.
- Hence, **all three statements are correct**, making **option D** the right answer.



**31. D** Adult members of any rural household

- The **Mahatma Gandhi National Rural Employment Guarantee Act, 2005** provides a **legal guarantee of wage employment** to **adult members of any rural household** who are willing to do **unskilled manual work**.
- **Eligibility under MGNREGA is universal within rural areas**, and is **not restricted** to:
  - Scheduled Castes or Scheduled Tribes,
  - Below Poverty Line (BPL) households, or
  - Backward communities.
- Any **adult (18 years and above)** residing in a **rural household** can register and seek employment under the Act.
- This universal coverage is a key feature of MGNREGA, making it a **rights-based demand-driven programme** rather than a targeted welfare scheme.

Therefore, **option D** correctly reflects the eligibility criteria under MGNREGA.

**32. C** Both 1 and 2

- **Statement 1 is correct:** India strongly championed the idea of the seabed beyond national jurisdiction as the “*common heritage of mankind*” during UNCLOS negotiations.
- **Statement 2 is correct:** India aligned with small and vulnerable island states, reinforcing its image as a maritime nation guided by equity and fairness.

**33. B** 1 and 2 only

- **Statement 1 is correct:** Initiatives like BEFF Monaco, Finance in Common Ocean Coalition, and COP30 show oceans are now central to global climate finance.
- **Statement 2 is correct:** BEFF Monaco (June 2025) announced **€8.7 billion in new commitments**, along with a €25 billion pipeline.
- **Statement 3 is incorrect:** The Indian Ocean Blue Fund is a **proposal**, not yet operational or compulsory.

**34. B** 1 and 3 only

- **Statement 1 is correct:** Green shipping corridors focus on low/zero-carbon fuels, clean vessels, port readiness, and coordinated regulation to cut emissions.
- **Statement 2 is incorrect:** The **SAGAR doctrine (2015)** stresses *peace, stability, and prosperity* through cooperation, not dominance.
- **Statement 3 is correct:** The concept of “*security through sustainability*” recognises that ecological instability directly threatens livelihoods and regional security.