KALAM ACADEMY IAS

Re-Defining UPSC Preparation

CURRENT *EDGE*

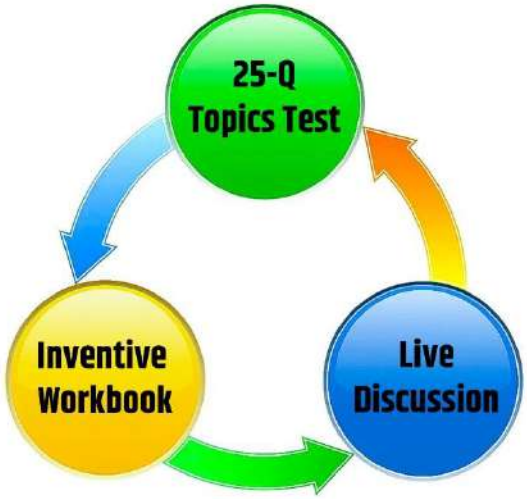
Session | Workbooks | Test Series | k-Snippet 365+

CSE (Pre.) 2026

CURRENT *EDGE*

WORKBOOK 01

JANUARY – FEBRUARY 2025



TOPICS:

- Delimitation fears in South
- Impact of Rupee Weakening
- India launches 21st Livestock Census
- Earthquake in Delhi – Feb 17, 2025
- Mission SCOT
- US further retreats from global bodies
- Joint military exercises gain momentum
- AgriSURE Fund (2025)
- Battle of Karnal (24 Feb 1739)

75+ Topics.....

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One-Stop Current Affairs Prelims 2026

Sessions || TESTS || WORKBOOKS || k-Snippet 365+

Comprehensive Coverage

Sessions: *31 Sessions (Roughly 50 hours)*

- ★ Phase 1: **10 sessions (Month-by-Month CA)**
- ★ Phase 2: **12 sessions (Subject-wise CA)**
- ★ Phase 3: **9 sessions (Snippets + Rapid Revision)**

Materials: *22 Weekly Materials + CA Snippet*

- ★ Phase 1: **10 Workbooks (≈ 50 pages each)**
- ★ Phase 2: **12 Subject-wise Compilations**
- ★ Phase 3: **1 Snippet Booklet (≈ 200 pages)**

Tests: *10 Tests (8 HLTs & 2 FLTs) | 600 MCQs*

- ★ Phase 1: **3 Tests (150 MCQs)**
- ★ Phase 2: **5 Tests (250 MCQs)**
- ★ Phase 3: **2 Full-Length Tests (200 MCQs)**

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CURRENT EDGE SCHEDULE

Phase-I: Month-by-Month Mastery

Session	Date	Coverage	Material	Test (Q)
SESSION 1	1 Nov (Sat)	Jan + Feb 2025	Workbook 1	–
SESSION 2	8 Nov (Sat)	Mar + Apr 2025	Workbook 2	–
SESSION 3	15 Nov (Sat)	May 2025	Workbook 3	–
SESSION 4	22 Nov (Sat)	June 2025	Workbook 4	23 Nov (Sun) – Test 1 (50 MCQs)
SESSION 5	29 Nov (Sat)	July 2025	Workbook 5	–
SESSION 6	6 Dec (Sat)	Aug 2025	Workbook 6	–
SESSION 7	13 Dec (Sat)	Sep 2025	Workbook 7	14 Dec (Sun) – Test 2 (50 MCQs)
SESSION 8	20 Dec (Sat)	Oct 2025	Workbook 8	–
SESSION 9	27 Dec (Sat)	Nov 2025	Workbook 9	–
SESSION 10	3 Jan (Sat)	Dec 2025	Workbook 10	4 Jan (Sun) – Test 3 (50 MCQs)

Phase-II: Subject-wise CA Modules

Week	Date	Coverage	Material	Test (Q)
01	5–10 Jan	Polity – Part 1	Polity CA Part 1	–
02	12–17 Jan	Polity – Part 2	Polity CA Part 2	18 Jan (Sun) – Test 4 (50 MCQs)
03	19–24 Jan	Geo. & Env. Part 1	Geo-Env CA Part 1	–
04	27–31 Jan	Geo. & Env. Part 2	Geo-Env CA Part 2	1 Feb (Sun) – Test 5 (50 MCQs)
05	2–7 Feb	Eco. & Agr. Part-1	Eco-Agri CA Part 1	–
06	9–14 Feb	Eco. & Agr. Part-2	Eco-Agri CA Part 2	15 Feb (Sun) – Test 6 (50 MCQs)
07	16–21 Feb	Science & Tech	Sci-Tech CA	–
08	23–28 Feb	International Relations	IR CA	1 Mar (Sun) – Test 7 (50 MCQs)
09	2–7 Mar	History & Art–Culture	History CA	–
10	9–14 Mar	Government Schemes	Schemes CA	
11	16–21 Mar	Society & Social Issues	Society-Social Issues CA	–
12	23–28 Mar	Updation	CA Update	29 Mar (Sun) – Test 8 (50 MCQs)

Note: Session Date will be notify

Phase-III: CA Snippet Sessions

Date	Snippet Focus	Test (Q)
6 Apr (Mon)	Polity	–
8 Apr (Wed)	Geography	–
10 Apr (Fri)	Environment	12 Apr (Sun) – CA FLT 1 (100 MCQs)
13 Apr (Mon)	Economy	–
15 Apr (Wed)	Science & Tech	–
17 Apr (Fri)	International Relations	19 Apr (Sun) – CA FLT 2 (100 MCQs)
20 Apr (Mon)	History & Art–Culture	–
22 Apr (Wed)	Government Schemes	–
24 Apr (Fri)	Society & Social Issues	–

Complete CA Snippet File Launch Release in 1st Week of April 2026

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Re-Defining UPSC Preparation

CURRENT *EDGE*

One-Stop Current Affairs Prelims 2026

Other Details

- Start: **1st Nov, 2025**
- Test Time : **10:00 AM**
- Class Time: **05:00 PM**
- Mode: **Online | Offline**
- Medium: **English**

FEE
₹4,000/-

Enroll: **https://bit.ly/3WkWhj3**

Concession Details

Kalam IAS Students: 10%	UPSC Interview Student: 20%	Selected Students: 25%

CSE 2024 TOPPERS


AIR 14 — Abhishek Vashishtha


AIR 228 — Devansh M. Dwivedi


AIR 290 — Aayushi Chaudhary


AIR 386 — Tanishi Kalra


AIR 393 — SARTHAK SINGH


AIR 543 — MANISH KUMAR

CSE 2021


17 — MEHAK JAIN


62 — POOJA TIRUMANI

CSE 2022


27 — YADAV SURYABHAN


64 — ANIRUDHA PANDEY

CSE 2023


1 — ADITYA SRIVASTAVA


10 — AISHWARYAM PRAJAPATI

WORKBOOK 1: JANUARY – FEBRUARY 2025

HOW TO USE CURRENT EDGE WORKBOOKS?

Dear Students,

This workbook is not just a file of news. It is a carefully crafted tool for your success in Prelims 2026. Over the last three years, Current Edge workbooks have given you ***20+ direct questions in Prelims every year*** *(See Brochure). Under the Current Edge 2026 program, each week, you will get a* ***60–70 page pack*** *— structured, selective, and exam-focused workbook. Special attention has been put to ensure that there is no random current affairs dumping and only those topics with high probability of being asked by UPSC as per PYQ pattern has been covered. Read it once with focus, and you will immediately feel the difference in clarity.*

A Quick Guide to Use the Workbooks Optimally:

Step 1: First Reading with Full Focus:

The workbook is divided subject-wise—Polity, Economy, Environment, Science & Technology, and more—so you read with clarity and structure. Within each subject, related topics are grouped together to build interlinked understanding. Every topic follows the same logical sequence: ***Why in News → Detailed News Coverage → Static Connect → Concept Check****.*

Step 2: Link Concepts, Don't Rote Learn

Use the news as your entry point and trace how it has evolved over time through policies, judgments, or government actions. Then, place it within the broader conceptual map of the syllabus so the fact becomes part of a bigger picture. When you reach the Concept Check MCQs, focus on identifying the themes UPSC is testing, the subtle traps in the options, and the details you cannot afford to miss. Every error highlights a blind spot—treat it as a chance to strengthen your foundation.

Step 3: Make the Workbook Your Own

Don't treat this as a passive booklet; make it your ***active workspace****. After each topic, note a one-line takeaway, and whenever you find a new update from the newspaper, PIB, or classroom, add it straight into the workbook. Over time, these short entries will turn it the Workbook into a* ***living document****—fully personalised, exam-focused, and far more valuable than any generic coaching handout.*

Step 4: Revise, Revise, Revise

Most students read once and move on—that's the biggest mistake. The real secret is repetition. Return to the same pages again and again, testing your recall each time. With every round, concepts settle deeper, linkages become clearer, and your Concept Check mistakes fade away. By the fourth or fifth reading, the topics will feel like second nature in the exam hall.

Step 5: Trust the Process

Week after week, these workbooks are designed to stack up into a powerful, exam-ready arsenal. If you stick to the method—focused reading, concept linking, constant updating, and disciplined revision—you cannot go wrong. The results may not show overnight, but the momentum will keep building. By Prelims 2026, you won't just be prepared with CA – you'll walk in with absolute ***Clarity, Control, and Confidence*** *that your preparation is unshakable.*

All The Best.

WORKBOOK 1 INDEX

INTERNATIONAL RELATIONS

53) *US further retreats from global bodies, exits WHO & UNHRC under "America First" drive*
54) *US President Trump threatens to retake control of the Panama Canal*
55) *China begins work on world's largest hydropower dam on Brahmaputra (Yarlung Zangbo)*
56) *Interpol rolls out Silver Notice to trace illicit assets globally*

INTERNAL SECURITY

57) *Joint military exercises gain momentum in 2025*
58) *Triple Induction: INS Nilgiri, INS Surat & INS Vaghsheer Commissioned into Indian Navy*
59) *DDoS Cyberattack Disrupts Kaveri 2.0 Portal*

GOVERNMENT SCHEMES

Ministry of Agriculture & Farmers Welfare (MoA&FW)

60) *Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA, 2018)*
61) *Pradhan Mantri Fasal Bima Yojana (PMFBY, 2016)*
62) *Prime Minister Dhan Dhaanya Krishi Yojana (PM-DKDY, 2025)*
63) *Agriculture Infrastructure Fund (2020-29)*
64) *AgriSURE Fund (2025)*
65) *Namo Drone Didi Scheme (2024)*

Ministry of Jal Shakti

66) *Jal Jeevan Mission (JJM, 2019)*

Ministry of Women & Child Development (MoWCD)

67) *Beti Bachao Beti Padhao (BBBP, 2015)*

Ministry of Health & Family Welfare (MoHFW)

68) *Intensified Special Non-Communicable Diseases (NCD) Screening Drive (2025)*

Ministry of Law & Justice

69) *DISHA (Designing Innovative Solutions for Holistic Access to Justice, 2025)*

Ministry of Earth Sciences (MoES)

70) *PRITHVI VIGYAN (Promoting Research in Earth Systems Science, Technology, & Human Resource Development, 2021–26)*

MISCELLANEOUS

71) *Padma Awards & Service Medals 2025 on 76th Republic Day*

SOCIETY & SOCIAL ISSUES

72) *Engaging Men & Boys: UNESCO-ICRW report charts pathways to gender equality in India*
73) *Oxfam report shows richest 1% now hold 45% of global wealth, inequality surges*

HISTORY, ART & CULTURE

74) *Launch of Gyan Bharatam Mission for Manuscript Conservation*
75) *Battle of Karnal (24 Feb 1739)*
76) *Tamil Nadu pushes Iron Age origin to 3,345 BCE, challenging global timelines*
77) *Deciphering Indus Valley Script: Global meet & million-dollar incentive*
78) *Rani Velu Nachiyar*
79) *358th Birth Anniversary of Guru Gobind Singh*

POLITY & GOVERNANCE

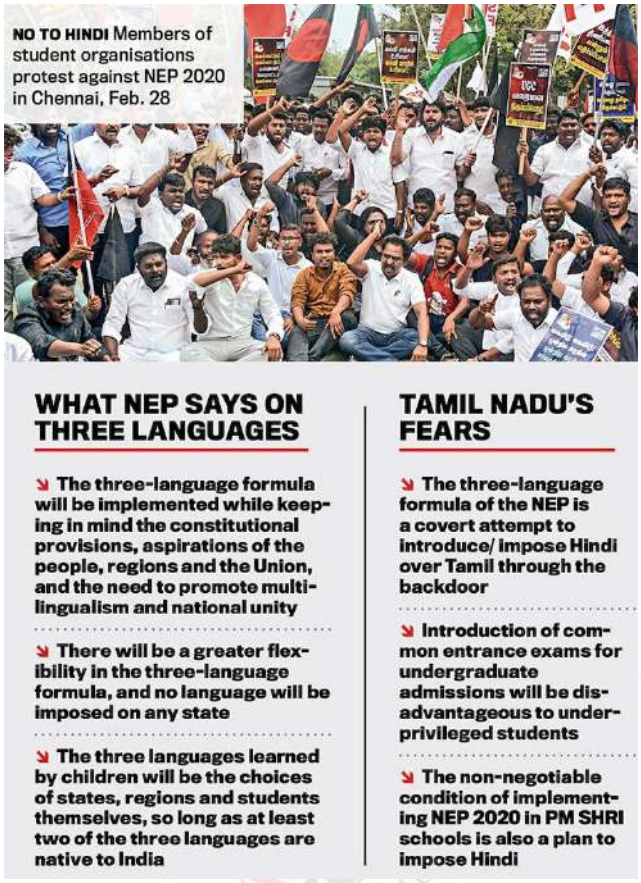
1. Opposition to Three-Language Formula under NEP resurfaces

Why in News?

Southern States esp. Tamil Nadu oppose NEP 2020's 3-language formula, alleging Hindi imposition & erosion of state autonomy.

NEP 2020: Language Provisions

- ***Recommends 3-language formula*** → *≥2 Indian/native languages*
- ***No imposition*** → *states/students choose*
- ***Medium of instruction*** → *home/mother tongue/regional lang till Grade 5 (preferably 8+)*
- ***Flexibility*** → *students may change langs ~Class 6/7*



Grounds of Opposition & State Reactions

- ***Tamil Nadu*** → *2-language policy (Tamil + English); opposes Hindi; cites coercion via SSA fund linkage*
- ***Centre withheld SSA funds (₹2,152 cr)*** → *TN moved SC (Court declined to mandate Centre)*
- ***Maharashtra*** → *debated/revoked GRs on Hindi as compulsory 3rd language*
- ***Karnataka*** → *own State Education Policy → 2-language model, rejects 3-language clause*

Constitutional & Federalism Issues

- ***Education → Concurrent List***
- ***Fund-withholding for non-compliance*** → *raises conditional federalism concerns*
- ***TN's stance rooted in anti-Hindi agitations*** *& linguistic autonomy*

Current Status

- ***Centre:*** *no language forced; SSA funds only if states sign MoU aligning with NEP*
- ***TN:*** *firm refusal (even for ₹10,000 cr)*
- ***SSA funds*** *still withheld*
- ***Wider debate*** → *linguistic identity, unity, policy coercion*

CONCEPT CHECK:

Q. The withholding of Samagra Shiksha Abhiyan (SSA) funds from Tamil Nadu due to its non-compliance with NEP's three-language policy raises which constitutional issue most directly?
(a) Doctrine of Pith and Substance
(b) Conditional Federalism
(c) Doctrine of Basic Structure
(d) Judicial Review of Parliamentary Privileges

Hint: *Language of early education → linked with cognitive development, not constitutional directive.*

 # What is your stance in this?

STATIC CONNECT:

Hindi as Official Language

Constitutional Provisions

- ***22 languages in 8th Schedule*** *→ Hindi is one among equals (not "national language")*
- ***Art. 343(1)*** *→ Hindi in Devanagari script = Official Language of Union*
- ***Numerals*** *→ International form of Indian numerals (Arabic numerals)*
- ***Art. 343(2)*** *→ English to continue for 15 yrs (till 1965) along with Hindi*
- ***Art. 343(3)*** *→ Parliament may provide continued use of English beyond 1965 → Official Languages Act, 1963*

Official Languages Act, 1963 (as amended 1967)

- *English + Hindi → to continue indefinitely for Union purposes*
- *English allowed in Parliament, judiciary, and Union-state communication (esp. with non-Hindi states)*

2. *Delimitation fears in South*

Why in News?

Chief Ministers of Andhra Pradesh and Tamil Nadu have voiced concerns that demographic changes might erode their states' parliamentary representation under the proposed delimitation.

Current Strength and Projected Strength of Major States and Southern states in Lok Sabha

State	Current Strength	Projected LS Seats if strength is Retained at 543 Post-2026 Delimitation	Projected LS Seats if strength is increased to 848 Post-2026 Delimitation
Total Southern States	*129 (23.74%)*	*103 (18.97%)*	*164 (19.34%)*
Uttar Pradesh	80 (14.73%)	91 (16.76%)	143 (16.86%)
Maharashtra	48 (8.84%)	48 (8.84%)	76 (8.96%)
West Bengal	42 (7.73%)	38 (6.99%)	60 (7.08%)
Bihar	40 (7.36%)	50 (9.21%)	79 (9.31%)
Madhya Pradesh	29 (5.34%)	33 (6.08%)	52 (6.13%)

Source: Election Commission of India and authors calculations
Note: Figures in parentheses show the state's percentage representation.

Constitutional / Legal Framework

- *Delimitation is* ***mandated after each census*** *via a Delimitation Commission under* ***Article 82*** *(Lok Sabha) and* ***Article 170*** *(State Assemblies).*
- ***Art. 81*** *→ Allocation of LS seats to states on basis of population (ratio near uniform)*
- ***42nd Amendment (1976)*** *→ Freeze on delimitation till 2001 (using 1971 Census)*
- ***84th Amendment (2001)*** *→ Extended freeze till 2026, permitted internal readjustments without altering total seats*
- ***87th Amendment (2003)*** *→ Based on 2001 Census for SC/ST reservation seat readjustments*
- ***Delimitation Commissions:*** *1952, 1963, 1973, 2002*

Why Southern States Oppose?

- ***Demographic Disadvantage:*** *Southern states (TN, AP, Kerala, Karnataka) achieved TFR ≈ replacement level (~2.1), unlike north (UP, Bihar still >2.5)*
  - *Ex: TN 39 seats → could fall to ~31, AP & Kerala may lose 2–4 seats each.*
  - *Northern states may gain: UP (80 → possibly 90+), Bihar (+10), MP, Rajasthan*
- ***Political Power Shift:*** *Current: South contributes ~130 LS seats (~24%) -> Post-delimitation: could ↓ to ~100 seats (~19%), shifting balance to north*

CONCEPT CHECK:

Q. Which of the following issues is NOT directly linked to the debate on delimitation?
(a) Fiscal federalism and southern states' contribution vs representation.
(b) Political power balance between north and south in Parliament.
(c) Reservation of seats for SC/ST in Lok Sabha and State Assemblies.
(d) Division of tax revenues under the Finance Commission's vertical devolution formula.

Hint: *Finance Commission tax devolution is separate; delimitation does not directly affect it.*

 # What are different proposed theories of Delimitation? (Important for Mains)

- ***Raises issues of fiscal federalism*** → *South already contributes ↑ share of taxes, may face ↓ say in Union*

Current Status (2025)

- ***Freeze ends 2026*** → *next Lok Sabha (2029) likely under new delimitation.*
- ***Centre's stand:*** *HM Amit Shah promised "seat loss won't happen" but mechanism unclear*
- ***South states forming joint front*** → *political mobilisation ongoing*

STATIC CONNECT:

Delimitation Commission

- *Set up under Delimitation Act → passed by Parliament* ***after every census***
- *Constitutional basis →* ***Art. 82*** *(Parliament) &* ***Art. 170*** *(State Assemblies)*
- *Appointed by* ***President*** *→ works in collaboration with Election Commission of India (ECI)*
- *Composition →* ***Retired SC judge (Chair)****, Chief Election Commissioner, State ECs concerned*
- *Objective → redraw LS & State Assembly constituency boundaries for population equality ("one person, one vote, one value")*
- ***Criteria*** *→ population balance, geographical contiguity, administrative convenience, compactness, avoid splitting villages/blocks*
- ***SC / ST reservation seats*** *adjusted as per latest population figures*
- *Orders of Commission →* ***final & binding****, not subject to judicial review,* ***cannot be modified by Parliament/Assemblies***
- *Delimitation Commissions in India →* ***1952, 1963, 1973, 2002*** *(using 2001 Census, effective from 2008)*
- *Freeze on seat allocation among states →* ***42nd Amendment*** *(1976), extended by* ***84th Amendment*** *(2002) → till first census after 2026*
- ***Recent Commission (2020)*** *→ J&K + 4 NE states; J&K delimitation report published in 2022*

3. President's Rule in Manipur Extended

Why in News?

Parliament approved 6-month extension of President's Rule (13 Aug 2025 → 13 Feb 2026)

Background & Trigger

- *CM N. Biren Singh resigned (9 Feb 2025) amid ethnic violence*
- *Violence since May 2023 → Meitei (valley) vs Kuki-Zo (hills)*
- *By late 2024 → ~258 dead, >60k displaced*
- *President's Rule imposed (13 Feb 2025) under Art. 356 → state under Governor (Ajay Kumar Bhalla)*

Constitutional & Administrative Provisions

- ***Art. 356*** *→ Union takeover if state fails constitutional norms*
- ***State Assembly*** *→ kept in suspended animation*
- ***Governor*** *→ central authority, with administrators' support*

Parliamentary Oversight & Extension

- *Continuation beyond 6m → needs* ***Parliament resolution***
- *LS passed earlier; RS cleared on 5 Aug 2025 (voice vote) → extension till 13 Feb 2026*

Situation & Impact

- ***Centre:*** *only 1 violent incident since PR imposed*
- ***Opposition/regionals:*** *demand Assembly dissolution + fresh polls*
- ***Ethnic fault lines persist*** *→ land, ST status, quotas, resources*

CONCEPT CHECK:

Q. Which of the following statements about President's Rule and Fundamental Rights is correct?

(a) During President's Rule, all Fundamental Rights (except Articles 20 & 21) are automatically suspended.

(b) President's Rule may suspend only Article 19 but not other Fundamental Rights.

(c) President's Rule does not directly suspend Fundamental Rights; such suspension can occur only under a National Emergency.

(d) During President's Rule, Fundamental Rights are modified but not entirely suspended.

Hint: *Compare with the effect of a National Emergency under Article 358/359.*

 # What are outcomes of recent PM visit to Manipur?

STATIC CONNECT:

Types of Emergencies in India

Feature	***National Emergency***	***State Emergency (President's Rule)***	***Financial Emergency***
Article	*Art. 352*	*Art. 356*	*Art. 360*
Grounds	*War, External Aggression, Armed Rebellion*	*Failure of constitutional machinery in state*	*Financial stability/credit threatened*
Who Proclaims?	*President (on Cabinet advice, written)*	*President (on Governor's report or otherwise)*	*President*
Parliamentary Approval	*Must be approved within 1 month (special majority)*	*Must be approved within 2 months (simple majority)*	*Must be approved within 2 months (simple majority)*
Duration (Initial)	*6 months*	*6 months*	*Indefinite (till revoked)*
Maximum Duration	*Unlimited (but approval every 6 months; 44th Amendment restricts fundamental rights suspension → max 1 year at a time in normal conditions, extended only if war/external aggression + EC certifies elections not possible)*	*Max 3 years (with special conditions after 1 year: EC certifies elections not possible or National Emergency in force)*	*No time limit (continues till revoked)*
Effect on Union–State Relations	*Union assumes overriding executive & legislative power*	*Union assumes State's executive & legislative functions*	*Union directions binding on States regarding finances*
Effect on Fundamental Rights	*Art. 358 → Automatic suspension of Art. 19 (only during War/External Aggression, not Armed Rebellion, per 44th Amendment) Art. 359 → FRs (except Arts. 20 & 21) can be suspended by Presidential Order*	*No direct suspension of FRs*	*No direct suspension of FRs*
Key Consequences	*- Union Parliament can legislate on State List - Duration extensions by Parliament*	*- Assembly dissolved/suspended - Governor runs state on Union's behalf*	*- Cut salaries/allowances of govt officials, judges - President controls financial matters, resource allocation*
Past Usage	*3 times (1962–71, 1971–77, 1975–77 Emergency under Indira Gandhi)*	*>125 times (most in UP, Punjab, Bihar, J&K)*	*Never used till date*
Judicial Safeguards	*Minerva Mills, Kesavananda, 44th Amendment*	*S.R. Bommai case (1994) → judicial review allowed*	*Not tested (never invoked)*

4. SC stays Lokpal order on HC judges

Why in News?

The Supreme Court has stayed the Lokpal's January 27, 2025 order asserting jurisdiction over High Court judges.

Background / Lokpal Act, 2013

- ***Section 14*** *of Lokpal Act defines "public servant" broadly, under which Lokpal claimed jurisdiction over HC judges.*
- *The Lokpal bench (Chaired by ex-SC judge Khanwilkar) held that certain HC judges fall within the Act's ambit and issued notices accordingly.*

Constitutional & Judicial Concerns

- *Judges have special status under the Constitution; misbehavior / removal of judges is governed under* ***Articles 124, 217, Judges (Inquiry) Act*** *etc.*
- *The SC in its stay order flagged the issue's gravity and "independence of judiciary."*
- *Under IPC / Bharatiya Nyaya Sanhita, a judge cannot be charged for acts done in judicial capacity (****Section 77 IPC****, mirrored in new law)*

CONCEPT CHECK:

Q. The doctrine of "Separation of Powers" in India is:
(a) Explicitly mentioned in the Constitution
(b) Implicit and derived from Articles 50, 121, 211 and judicial interpretation
(c) Derived solely from the Government of India Act, 1935
(d) Identical to the American model

Hint: *It's not textual, but functional.*

- *Also, in **K. Veeraswami v. Union of India (1991)**, SC held that investigating a judge under PCA requires presidential sanction (after consultation with CJI) to guard against frivolous prosecutions.*

Supreme Court's Action

- *The Supreme Court took suo motu cognisance of the matter.*
- *It stayed the Lokpal order.*
- *The bench described the issue as "very, very disturbing."*
- *It sought responses from Union Govt, Lokpal Registrar, complainants etc.*

 # Are Judges above everything?

STATIC CONNECT:

Lokpal & Lokayuktas Act, 2013

- *Enacted: Lokpal & Lokayuktas Act, 2013 → in force from Jan 2014*
- *Composition → **Chairperson + max 8 members** (50% judicial, 50% SC/ST/OBC/Minorities/Women)*
- *Appointed by → **President** (recommendation of Selection Committee)*
  - *PM, Speaker LS, LoP LS, CJI/nominee, eminent jurist (President-nominated)*
- *Tenure → **5 yrs or till 70 yrs age***
- ***Jurisdiction** → PM (with exceptions: national security, external relations, atomic energy), Ministers, MPs, Group A–B officers & officials of Union*

Powers & Functions

- *Inquiry → Lokpal can direct CBI to investigate corruption cases*
- *Superintendence → over CBI (in corruption cases under PCA, 1988)*
- *Seizure of records, search & seizure powers → with court's approval*
- *Filing of chargesheets before Special Courts*
- *Lokpal members & officials deemed "public servants" under IPC*

Lokayuktas – State-level Ombudsman

- *Mandated under Act → every state to establish Lokayukta within 1 yr (flexibility on structure, powers)*
- *Appointment by → **Governor** (consulting CM, CJI of HC, LoP in state assembly)*
- *Variations across states → Karnataka (first Lokayukta 1984), Maharashtra, Kerala strong Lokayuktas; few states weak/only advisory*

5. Meghalaya party demands Article 371 for coal mining

Why in News?

Regional party in poll-bound Meghalaya demands Article 371 status to legalise rat-hole coal mining (currently banned).

Constitutional & Legal Framework

- *Meghalaya → under **Sixth Schedule** → Autonomous District Councils (ADCs) control land, forests, customs.*
- ***Para 12A** → State laws override ADC laws in conflict.*
- ***Article 371 variants** → special protections; e.g. 371A (Nagaland) → central laws on land/resources need Assembly consent.*

Rat-Hole Coal Mining: Status

- ***Method** → primitive tunnels (3–4 ft × 2–3 ft) to access coal seams.*
- ***NGT ban** → Apr 2014.*
- ***SC (2019)** → upheld ban; MMDR Act, Mines Act, Env. laws apply over customs.*
- ***Reality** → Illegal mining persists → env. damage + deaths.*

Demand for Article 371: Proponents' View

- *Article 371 → could exempt Meghalaya from NGT/SC ban.*
- *Cite **Nagaland under 371A** → mining continues despite restrictions.*
- *Claim → tribal customs & resource control > external regulation.*

CONCEPT CHECK:

Q. Which of the following provisions reflect asymmetrical federalism in India?

1) Sixth Schedule
2) Article 371A (Nagaland)
3) Article 239AA (Delhi)
4) Article 243M (exceptions to Panchayati Raj in Scheduled Areas)

(a) 1, 2 and 3 only
(b) 1 and 4 only
(c) 1, 2, 3 and 4
(d) 2 and 3 only

***Hint:** Any provision creating exceptions/special structures counts as asymmetry.*

 # Law vs Ethics? (Note down in your Ethics note)

STATIC CONNECT:

Article 371 vs Sixth Schedule

Aspect	***Article 371 (Special Provisions)***	***Sixth Schedule (Autonomous Districts & Councils)***
Constitutional Location	*Part XXI (Temporary, Transitional & Special Provisions)*	*Part XXI, Schedule VI*
Applicability	*Specific States (Maharashtra, Gujarat, Nagaland, Assam, Manipur, Andhra, Telangana, Sikkim, Mizoram, Arunachal, Goa, Karnataka)*	*NE States → Assam, Meghalaya, Tripura, Mizoram*
Purpose	*Special provisions to meet regional demands & safeguard local interests*	*Protect tribal culture, autonomy, traditional institutions*
Admin. Structure	*Governor given special responsibilities (eg: Nagaland – Art. 371A, Mizoram – 371G)*	*Autonomous District Councils (ADCs) → partly elected, partly nominated*
Law-making Power	*Legislature of the State with certain restrictions (eg: customary law in Nagaland, Mizoram)*	*ADCs can make laws on land, forests (non-reserve), shifting cultivation, village administration, marriage/divorce, inheritance, social customs*
Financial Power	*No separate taxation powers; financial assistance from Centre*	*ADCs empowered to levy & collect taxes on lands, shops, entry of goods, vehicles, professions, etc.*
Judicial Powers	*Not provided*	*ADCs can constitute village courts (for trial of suits & cases involving tribals)*
Governor's Role	*Special responsibility to protect rights of locals (eg: Nagaland → law & order, resources)*	*Approves/assents to laws of ADCs; modifies acts of Parliament/State in tribal areas*
Representation in Parliament	*Normal State representation*	*No special additional representation (same as other regions)*
Amendment Process	*Amendable under Art. 368 (requires constitutional amendment)*	*Also amendable under Art. 368, but very rarely changed (eg: inclusion of new areas)*
Current Status / Updates	*Art. 371 in news due to debates on extending "special provisions" after abrogation of Art. 370 (J&K)*	*6th Schedule demand by other NE tribal groups (eg: Arunachal, Ladakh) pending; Bodoland Territorial Council under it*

6. Devolution Index: Status of Devolution to Panchayats in States – An Indicative Evidence Based Ranking (2024)

Why in News?

Ministry of Panchayati Raj *released the Devolution Index Report in February 2025 to evaluate how well states/UTs have devolved powers, functions, finances, and accountability to Panchayati Raj Institutions.*

Objective & Scope

- *To assess devolution under* ***4Fs + 2 dimensions*** *— Framework, Functions, Finances, Functionaries, Capacity Building, Accountability (6 Dimensions)*
- *Evaluate transfer of powers/resources with respect to subjects in* ***Eleventh Schedule*** *under* ***Article 243G****.*

Key Findings

- *Overall devolution to rural local bodies rose from ~ 39.9% (2013-14) to ~ 43.9% (2021-22)*
- ***Top states (2024 ranking):*** *Karnataka (1), Kerala (2), Tamil Nadu (3), Maharashtra (4), Uttar Pradesh (5)*
- ***Low performers / UTs:*** *Daman & Diu (~13.62 score), Puducherry (~16.16), Ladakh (~16.18)*

CONCEPT CHECK:

Q. Which of the following are mandatory provisions under the 73rd Constitutional Amendment (1992)?

1) *Establishment of State Finance Commission every five years*
2) *Reservation of at least 1/3rd seats for women in Panchayats*
3) *Constitution of District Planning Committees*
4) *Conduct of elections to Panchayats every 5 years*

Select the correct code:

(a) 1, 2 and 4 only
(b) 2 and 3 only
(c) 1, 2, 3 and 4
(d) 1 and 4 only

Hint: *DPC (District Planning Committee) is in 74th Amendment (Urban), not 73rd.*

 # What is performance of your State?

STATIC CONNECT:

73rd Amendment Act, 1992 (Part IX, Panchayats) & Article 243G & Eleventh Schedule

- *The 73rd Amendment gave constitutional status to Panchayati Raj institutions by inserting* ***Part IX (Articles 243–243O)*** *into the Constitution.*
- *Article 243G empowers State Legislatures to endow Panchayats with powers & authority for effective self-government.*
- *Eleventh Schedule lists* ***29 functional subjects*** *(e.g., agriculture, water, health, social welfare, infrastructure) that may be devolved to Panchayats.*
- ***Key Fixed Provisions***
  - *Term =* ***5 years****; elections before expiry obligatory.*
  - *Reservation:* ***1/3 seats for women*** *in every Panchayat; proportional reservation for* ***SC/STs****.*
  - *States may legislate the distribution of fiscal powers, functions & functionaries ("3 Fs") to Panchayats.*

7. Appointment of new Chief Election Commissioner under revised law

Why in News?

A high-level committee met to select India's next CEC under the Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023.

Constitutional & Statutory Basis

- ***Article 324*** *empowers the President to appoint the CEC/ECs, subject to "law made by Parliament."*
- *The 2023 Act (enacted December 2023) replaces the 1991 Act and lays down the procedure, eligibility, term, and removal of CEC/ECs.*

New Selection Process under 2023 Act

- *Under Section 7 of the 2023 Act, the President appoints CEC/ECs on recommendation of a Selection Committee.*
- ***Search Committee*** *(led by Law Minister or a member of Union Cabinet) proposes a panel of 5 names.*
- ***Selection Committee composition:***
  - *Prime Minister (Chair)*
  - *Leader of Opposition in Lok Sabha (or leader of largest opposition party)*
  - *A Union Minister nominated by PM*
- *The Selection Committee may choose from the panel or consider other names too (i.e. not strictly bound to the five).*
- *The Act removes the earlier SC-mandated inclusion of the Chief Justice of India in the selection panel (i.e., CJI replaced by a Minister)*

Eligibility, Tenure & Removal

- *Must be or have been a* ***Secretary-level officer*** *in Union Government.*
- *Term =* ***6 years*** *or until attaining* ***age 65****, whichever is earlier.*
- ***No reappointment*** *permitted.*
- *Removal of CEC only by process like removal of a Supreme Court Judge (impeachment) on grounds of misbehavior or incapacity.*
- *An EC (Election Commissioner) can be removed on recommendation of the CEC.*

CONCEPT CHECK:

Q. Which of the following correctly distinguishes between the 1991 Act and the 2023 Act on the appointment of the Chief Election Commissioner (CEC)?
(a) 1991 Act required consultation with the Chief Justice of India (CJI), while 2023 Act removed it.
(b) 1991 Act allowed President to appoint CEC/ECs without any collegium, while 2023 Act mandates a Selection Committee.
(c) 1991 Act fixed CEC's tenure at 6 years, while 2023 Act increased it to 7 years.
(d) 1991 Act allowed reappointment, while 2023 Act prohibits it.

Hint: *Remember: CJI's role came from SC judgment (2023 Anoop Baranwal case), not from the 1991 Act.*

 # So much in EC vs Raga – Will cover in upcoming Workbooks.

STATIC CONNECT:

Article 324: Election Commission of India (ECI)

- *Vests "superintendence, direction & control" of elections →* ***President, VP, Parliament, State Legislatures***

- *Provides for Election Commission → single-member (CEC) or multi-member (CEC + ECs)*

Composition & Appointment

- *CEC + ECs → appointed by President*
- *Service conditions & tenure → Parliament by law, until then President decides*
- *CEC removal → like SC judge (special majority of both Houses)*
- *ECs removal → by President on CEC's recommendation*

Powers & Functions

- *Delimitation of constituencies → earlier, but now by Delimitation Commission (separate law)*
- *Preparation & revision of electoral rolls*
- *Conduct of free & fair elections → LS, RS, SLAs, SLCs, President, VP*
- *Model Code of Conduct enforcement*
- *Recognition of political parties, allotment of symbols*

8. *Rajasthan HC warns against misuse of Section 152 BNS to muzzle dissent*

Why in News?

*The Rajasthan High Court cautioned that **Section 152 of the Bharatiya Nyaya Sanhita (BNS)** — which criminalises acts "endangering sovereignty, unity & integrity of India" — should not be used as a tool to suppress legitimate criticism or dissent.*

Key Statutory / Legal Context

- ***Section 152, BNS (2023)** replaces old **Section 124A IPC (sedition)** and penalises acts done "purposely or knowingly" that:*
  - *excite or attempt to excite secession, armed rebellion, subversion*
  - *encourage separatist activity*
  - *endanger India's sovereignty, unity, integrity*
  - *via words, signs, visible representations, electronic means, financial support, etc.*
- ***Punishment & nature***
  - *Life imprisonment or up to 7 years + fine*
  - *Cognizable & non-bailable offence*
  - *Contains an "Explanation" clause: expressions of disapproval of govt or measures seeking change by lawful means shall not be taken as offence under this section*

Rajasthan HC Decision & Observations: Tejender Pal Singh v. State of Rajasthan

- *FIR under S.152 & S.197 BNS for social media video expressing sympathy toward a pro-Khalistan leader.*
- *HC quashed the FIR, holding no offence was made out under those provisions.*
- *Criticism of government alone cannot be equated with anti-national act.*
- *There must be a "direct & imminent connection" between speech and rebellion / subversion to invoke S.152.*
- *The court said S.152 must act as a shield securing national integrity, not a sword to penalize dissent.*

CONCEPT CHECK:

Q. Which of the following is not a requirement (or threshold) as laid down by the Rajasthan High Court in Tejender Pal Singh v. State of Rajasthan to invoke Section 152 BNS?

(a) The act must be done "purposely or knowingly" (i.e. mens rea)

(b) There must be a direct and imminent connection between speech and rebellion / subversion

(c) Mere criticism of government's policies, if harsh, qualifies as offence

(d) The "Explanation" clause excludes disapproval by lawful means from the offence

***Hint:** The Court rejected the idea that strong criticism alone is enough.*

 # Is this law used against Sonam Wangchuk?

9. *"Article 101(4)" invoked over Amritpal Singh's prolonged absence from Lok Sabha*

Why in News?

Amritpal Singh, jailed MP, invokes Article 101(4) to avoid seat vacancy due to absence.

Article 101(4) — Key Provisions

- *MP absent ≥ **60 days w/o House permission** → seat may be declared vacant*
- *Exclusion → prorogation / adjournment > 4 days not counted*

CONCEPT CHECK:

Q. Under Article 101(4) of the Indian Constitution, the seat of a Member of Parliament (MP) may be declared vacant if the member is absent from all meetings of the House for at least:

• *Operative clause → **"Permission of the House"** (via Committee on Absence of Members, LS)* • *Vacancy not automatic → requires **House declaration** (vote)* • *No precedent of MP losing seat solely under Art. 101(4)* ***Case of Amritpal Singh*** • *MP, Khadoor Sahib → under NSA detention since Apr 2023* • *Won 2024 LS election from jail* • *LS Attendance ≈ 2 %* • *Petitioned for leave to avoid Art. 101(4) vacancy* • *Centre granted **54 days leave of absence***	*(a) 30 days* *(b) 45 days* *(c) 60 days* *(d) 90 days* *# Why Parliament not using this provision?*

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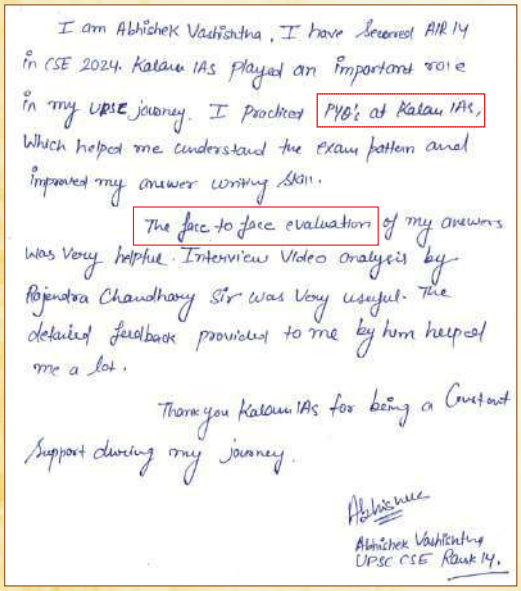


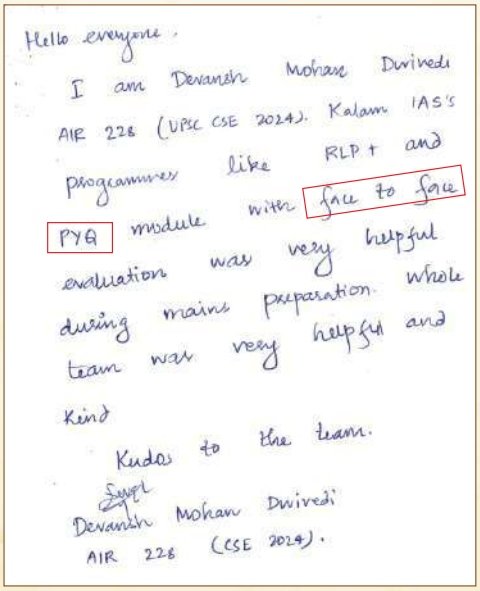
I am Abhishek Vashishtha, I have Secured AIR 14 in CSE 2024. Kalam IAs played an important role in my UPSC journey. I Practiced PYQ's at Kalam IAs, which helped me understand the exam pattern and improved my answer writing skill.

The face to face evaluation of my answers was very helpful. Interview Video analysis by Rajendra Chaudhary Sir was very useful. The detailed feedback provided to me by him helped me a lot.

Thank you Kalam IAs for being a Constant Support during my journey.

Abhishek Vashishtha
UPSC CSE Rank 14.

Devansh M. Dwivedi, **AIR-228** [CSE 2024]



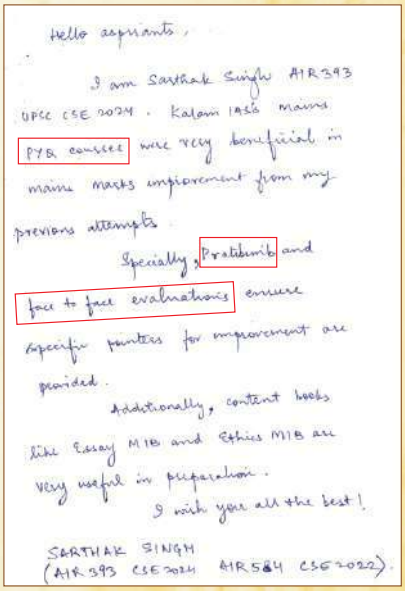
Hello everyone,

I am Devansh Mohan Dwivedi AIR 228 (UPSC CSE 2024). Kalam IAS's programmes like RLP + and PYQ module with face to face evaluation was very helpful during mains preparation. Whole team was very helpful and kind

Kudos to the team.

Devansh Mohan Dwivedi
AIR 228 (CSE 2024).

Sarthak Singh, **AIR-393** [CSE 2024]



Hello aspirants,

I am Sarthak Singh AIR393 UPSC CSE 2024. Kalam IAS's mains PYQ courses were very beneficial in mains marks improvement from my previous attempts.

Specially Pratibimb and face to face evaluations ensure specific pointers for improvement are provided.

Additionally, content books like Essay MIB and Ethics MIB are very useful in preparation.

I wish you all the best!

SARTHAK SINGH
(AIR-393 CSE 2024 AIR584 CSE 2022)

ECONOMY

10. India achieves 14.3 % share of global remittances in 2024

Why in News?

*As per World Bank data, India's share in global remittances rose to **14.3 %,** the highest ever recorded.*

India & Global Remittances

- *Total remittances to low- and middle-income countries in 2024 expected at US$ 685 billion, growth ~5.8 % (vs 1.2 % in 2023)*
- *Top recipient in 2024: **India (~US$ 129 billion)***
- *Next major recipients: Mexico (~US$ 68 billion), China (~US$ 48 billion)*
- *Major source of Remittances to Indias: **USA** (~23 %), **UAE** (~18 %), **UK, Singapore, Saudi Arabia***

CONCEPT CHECK:

Q. Assertion (A): Remittances are recorded under the current account (invisibles) in India's Balance of Payments.
Reason (R): Because remittances represent transfer of resources without corresponding goods or services exchange.
Which of the following is correct?
(a) (A) and (R) both true, and (R) correctly explains (A)
(b) (A) and (R) both true, but (R) does not explain (A)
(c) (A) true, (R) false
(d) (A) false, (R) true

Hint: *Remittances do not involve a quid pro quo in goods or services.*

 # Will Trump end this lead?

STATIC CONNECT:

India's BoP & Remittances

Balance of Payments (BoP) – Basics

- *BoP = record of all external economic transactions in a year*
- ***Components: Current A/c + Capital A/c + Errors & Omissions***
- ***Current A/c** → Trade balance (exports – imports of goods & services) + Invisibles (remittances, software, tourism etc.)*
- ***Capital A/c** → FDI, FPI, ECBs, loans, banking capital etc.*
- *Managed by RBI under FEMA, 1999*

Remittances in BoP

- *Classified as **Private Transfers (Invisibles, Current A/c)***
- *Sub-components: workers' remittances, local withdrawals from NR accounts, gifts, pensions etc.*
- *Remittances help offset merchandise trade deficit*
- *India = top global recipient of remittances*

11. Impact of Rupee Weakening: REER at Record High

Why in News?

The rupee's Real Effective Exchange Rate (REER) reached a record 108.14 in November 2024, despite its nominal depreciation against the US dollar.

What is REER?

- *REER = trade-weighted, inflation-adjusted value of the currency vs external partners (adjusts NEER for price levels)*
- *Base year = 2015-16; value >100 → rupee is "overvalued" relative to base period*
- *Helps assess external competitiveness (exports/imports) beyond just USD terms*

Recent Developments & Data

- *Nov 2024: REER reached 108.14 (from 107.20 in Oct) → 0.9% m-o-m rise*

CONCEPT CHECK:

Q. The Real Effective Exchange Rate (REER) of the currency is above 100 (with base year = 100). Which of the following is the most correct inference under that scenario?
(a) The currency is undervalued relative to base year, implying improved export competitiveness

- *That is its highest level in current series → indicates overvaluation of ~8% relative to "fair" levels*
- *In December 2024, REER moderated to ~107.20 after the November peak*
- *Meanwhile, nominally the rupee was depreciating against USD, hitting record lows in 2024*
- *Despite nominal depreciation, rupee had "appreciated" in real trade-weighted terms (due to inflation differentials and currency moves of trading partners)*
- *Because many of India's trading partners' currencies also weakened or had inflation differentials, rupee's relative real value rose.*

(b) The currency is overvalued relative to base year, implying reduced export competitiveness
(c) The currency's nominal value must have appreciated against the US dollar
(d) The currency's nominal value must have depreciated against its trading partners

Hint: *Overvaluation in real terms means domestic goods become costlier for foreign buyers.*

 # How too low inflation in India affects REER & NEER?

STATIC CONNECT:
NEER vs REER

Feature	***NEER (Nominal Effective Exchange Rate)***	***REER (Real Effective Exchange Rate)***
Definition	*Weighted avg. of a country's currency vs basket of other currencies (nominal terms)*	*NEER adjusted for inflation differentials between domestic & trading partners*
Basis	*Market exchange rates*	*Relative price levels (inflation) + NEER*
Reflects	*Pure currency movements*	*Currency movements + competitiveness (inflation impact)*
Nature	*Nominal (not inflation adjusted)*	*Real (inflation adjusted)*
Indicator of	*External value of currency*	*Competitiveness of domestic goods vs foreign goods*
Calculation	*Geometric weighted avg. of bilateral nominal rates*	*NEER × (Domestic Price Index / Foreign Price Index)*
↑ Value means	*Domestic currency appreciating nominally*	*Domestic goods less competitive (overvaluation)*
↓ Value means	*Domestic currency depreciating nominally*	*Domestic goods more competitive (undervaluation)*
Published by	*RBI (India) – both NEER & REER indices*	*RBI*
Current Status	*RBI publishes **36-currency & 6-currency indices** (monthly)*	*Used as key indicator of export competitiveness*

12. WPI Revision & Transition to PPI: India moves to modernise inflation measurement

Why in News?
Govt has constituted a working group to revise WPI's base year (from 2011-12 to 2022-23) and chart a roadmap to shift from WPI to PPI.

WPI → PPI Transition & Base Revision

Background & Need for Change

- *WPI currently uses base year **2011-12**, which is outdated given structural changes in economy.*
- *WPI covers **goods only**, excludes services and is **sensitive to tax/indirect tax fluctuations**.*
- *Many global economies use **Producer Price Index (PPI)** which captures price changes from producers' perspective, often **covering goods + some services**.*

CONCEPT CHECK:
Q. Assertion (A): The transition from WPI to PPI will help avoid distortions arising from indirect taxes in the inflation index.
Reason (R): PPI is calculated at basic prices and excludes taxes, transport & trade margins, while WPI is more affected by tax fluctuations.
Which is correct?
(a) (A) and (R) both true, and (R) correctly explains (A)

What's Being Proposed / Underway?

- *A working group led by NITI Aayog member **Ramesh Chand** has been set up to revise WPI base year and suggest a PPI model.*
- *The group is asked to recommend: commodity & service baskets, computation methodology, data collection improvements, linkages between old & new series.*
- *New indices (WPI-2022-23 series, PPI, revamped IIP) will use data compiled retrospectively from April 2022*
- *A nationwide survey across manufacturing / industrial establishments is being launched to collect primary data for new series.*

(b) (A) and (R) both true, but (R) does not explain (A)
(c) (A) true, (R) false
(d) (A) false, (R) true

***Hint:** The exclusion of indirect taxes is a key conceptual advantage cited for PPI over WPI.*

STATIC CONNECT:
Inflation Indicators in India

Indicator	***Base Year***	***Coverage***	***Measures***	***Published by***	***Frequency***	***Use / Importance***
WPI (Wholesale Price Index)	*2011-12 (rev. to 2022-23 in progress)*	*~697 items (Primary articles, Fuel & power, Manufactured goods)*	*Price change at **wholesale level** (goods only, no services)*	***Office of Economic Adviser (DPIIT, MoCI)***	*Monthly*	*GDP deflator, tracks supply-side inflation*
CPI (Consumer Price Index)	*2012 (rural & urban separately)*	*Goods + Services consumed by households*	*Price change at **retail level***	***NSO, MoSPI***	*Monthly*	*Used by RBI for **Monetary Policy (inflation targeting)***
CPI-Combined (CPI-C)	*2012*	*Rural + Urban basket*	*Headline retail inflation*	*NSO, MoSPI*	*Monthly*	*Official inflation target (4% ± 2%)*
CPI-Rural / CPI-Urban	*2012*	*Rural / Urban consumption baskets*	*Regional inflation*	*NSO*	*Monthly*	*Rural vs Urban trends*
CPI-AL (Agricultural Labourers)	*1986-87*	*Items consumed by agricultural labourers*	*Rural cost of living*	*Labour Bureau, MoLE*	*Monthly*	*Wage indexation, poverty studies*
CPI-RL (Rural Labourers)	*1986-87*	*Items consumed by rural labour households*	*Rural inflation*	*Labour Bureau*	*Monthly*	*Same as above*
CPI-IW (Industrial Workers)	*2016*	*Consumption basket of industrial workers*	*Cost of living index for workers*	*Labour Bureau*	*Monthly*	***DA (Dearness Allowance) fixation**, wage negotiations*
PPI (Producer Price Index – proposed)	*To be 2022-23*	*Goods + some services (producers' perspective)*	*Price change at **producer level***	*DPIIT (proposed)*	*Monthly (planned)*	*Globally aligned indicator for inflation, input costs*

13. RBI: India's Quality of Public Expenditure hits highest since 1991

Why in News?

RBI's monthly bulletin reveals that India's "Quality of Public Expenditure" (QPE) index is now at its best level since liberalisation began in 1991.

Quality of Public Expenditure (QPE) — Concept & Indicators

- *The QPE index tracks how well government funds are used, not just how much is spent.*

CONCEPT CHECK:

Q. Which one of the following does not form a component of RBI's Quality of Public Expenditure (QPE) index?
(a) Capital outlay to GDP ratio

- *It combines **5 key indicators:***
  - *Capital outlay to GDP ratio*
  - *Revenue expenditure : Capital outlay ratio (lower is better)*
  - *Development expenditure to GDP ratio*
  - *Development expenditure share of total expenditure*
  - *Interest payments to total government expenditure ratio (lower is better)*

Why QPE Is at Its Peak Now?

- *Surge in capital expenditure across Centre & states → stronger infrastructure push.*
- *Better balance: relatively lower rise in non-productive revenue expenditure (salaries, subsidies) vis-à-vis capex.*
- *Controlled interest burden, improving debt servicing metrics.*
- *Shift in fiscal mindset: more borrowing directed to productive assets than consumption.*

(b) Revenue expenditure to capital outlay ratio
(c) Subsidies to GDP ratio
(d) Interest payments to total government expenditure ratio

***Hint:** All components relate to capital, development or interest burden.*

14. T-bills Borrowing Surge: Govt Issues Rs 3.94 Lakh Crore in Treasury Bills

Why in News?

The government plans to raise ₹3.94 lakh crore via issuance of short-term Treasury Bills (T-bills) in upcoming auctions.

What are T-Bills & Their Role?

- *T-Bills = **zero-coupon, short-term government securities** with maturities of **91, 182, 364 days***
- *Issued to meet short-term (cash flow / interim) borrowing needs*
- *Highly liquid, low risk (full government backing)*
- *Flexibility: RBI + government may adjust amounts/timings based on liquidity & market conditions (with prior market notice)*

CONCEPT CHECK:

Q. Which one of the following statements about Treasury Bills (T-Bills) in India is not correct?
(a) They are zero-coupon instruments issued at a discount and redeemed at face value
(b) They are issued in maturities of 91, 182 and 364 days
(c) They are a type of dated government security
(d) They are used by the government to manage its short-term borrowing requirements

***Hint:** Distinguish "short-term instruments" from "dated / long-term securities."*

STATIC CONNECT:

Other Government Debt Instruments

Instrument	***Tenure***	***Coupon / Yield***	***Purpose***	***Key Features***	***Current Status (2024–25)***
Treasury Bills (T-Bills)	*91, 182, 364 days*	*Issued at discount, no coupon (zero-coupon)*	*Meet short-term govt. funding needs*	*Tradable → NDS-OM; Issued via auctions by RBI*	*Q4 FY25 T-bill borrowing ↑ to ₹3.94 lakh cr*
Cash Management Bills (CMBs)	*< 91 days*	*Zero-coupon (discounted)*	*Cover temporary mismatches in govt. cash flows*	*Similar to T-Bills, flexible maturities*	*Used intermittently for cash-flow mismatches*
Dated Government Securities (G-Secs)	*5–40 yrs*	*Fixed / floating coupon (semi-annual)*	*Finance fiscal deficit*	*Benchmark 10-yr G-Sec = indicator of LT yields; Tradable on secondary market*	*FY25 gross mkt borrowing target: ~₹14.13 lakh cr (via dated G-Secs)*

State Development Loans (SDLs)	*Usually 10 yrs*	*Higher yield than central G-Secs (risk premium)*	*States' budgetary needs*	*Issued by States; Managed by RBI auctions*	*Regular issuance by states; yields > central G-Secs*
Inflation-Indexed Bonds (IIBs)	*Medium to long-term*	*Principal + coupon linked to CPI / WPI*	*Hedge against inflation*	*Inflation protection → both principal & coupon adjusted*	*Not actively issued in recent years*
Floating Rate Bonds (FRBs)	*Medium to long-term*	*Coupon resets periodically (linked to benchmark, e.g., 182-day T-Bill)*	*Diversify borrowing instruments*	*Interest rate risk mitigation*	*Issued as part of govt. borrowing mix*
Green Bonds (Sovereign)	*Medium to long-term*	*Fixed coupon (typically lower vs G-Secs)*	*Finance climate / renewable projects*	*First sovereign issue FY23; earmarked for green infra*	*Sovereign Green Bonds worth ₹20,000 cr issued since 2023*

15. PLI-driven smartphone exports hit US $13.1 billion

Why in News?

The PLI scheme disbursed ~US $1 billion over three years to 19 smartphone manufacturers, fueling record exports.

PLI Scheme for Smartphones: Key Facts & Developments

- ***Scheme Duration & Disbursal***
  - *Govt disbursed ~US $1 billion (≈ ₹8,700 crore) under smartphone PLI during 2022-23 to 2024-25*
  - *19 firms benefited; top 5 (Foxconn, Tata Electronics, Pegatron, Samsung, Padget) got >98% of disbursements.*
  - *In distribution, Apple's contract manufacturers (Foxconn, Tata, Pegatron) received ~75% of scheme funds.*
- ***Export Impact & Scale***
  - *Between April–November 2024, smartphone exports reached ~US $13.1 billion — making handsets the second highest export item for India.*
  - *This is a steep rise from ~US $1.6 billion in FY 2019 (pre-PLI) for global smartphone shipments.*
- ***Policy & Strategic Moves***
  - *PLI increased allocation in Budget 2025–26 to ₹8,885 crore for smartphone manufacturing.*
  - *Centre for Development Studies (CDS) recommends extension of mobile PLI, citing 23% domestic value addition in 2022-23 (~US $10 billion).*

CONCEPT CHECK:

Q. Which of the following sectors is NOT covered under the Production-Linked Incentive (PLI) scheme?
(a) Drones and Drone Components
(b) High-Efficiency Solar PV Modules
(c) Agricultural Machinery (tractors and harvesters)
(d) Advanced Chemistry Cell (ACC) Battery

Hint: *14 sectors are covered, but agriculture machinery is not one of them.*

 # Raga: India is not manufacturing smartphones but assembling them here. What is your take?

- *Critics/analysts note concentration of benefits to few firms; risk of diminishing marginal returns.*

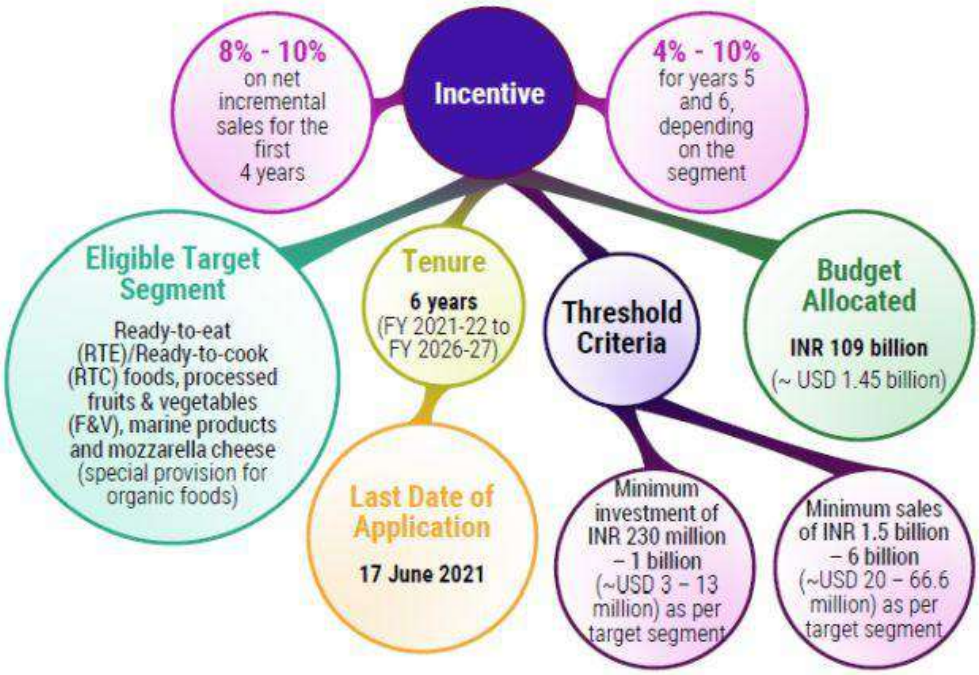
STATIC CONNECT:

PLI Scheme: Basics

- *Launched → 2020, Atmanirbhar Bharat Abhiyan*
- *Objective → Boost domestic manufacturing, reduce imports, ↑ exports, integrate India in global value chains*
- *Mechanism → Firms get incentives (4–6%) on incremental sales of goods manufactured in India over base year*
- *Duration → 5 yrs (varies by sector), renewable based on performance*

Coverage & Sectors

- *Total Sectors Covered → **14***
  1. *Mobile Manufacturing and Specified Electronic Components*
  2. *Critical Key Starting Materials/Drug Intermediaries & Active Pharmaceutical Ingredients*
  3. *Manufacturing of Medical Devices*
  4. *Automobiles and Auto Components*
  5. *Pharmaceuticals Drugs*
  6. *Specialty Steel*
  7. *Telecom & Networking Products*
  8. *Electronic/Technology Products*
  9. *White Goods (ACs and LEDs)*
  10. *Food Products*
  11. *Textile Products (MMF segment and technical textiles)*
  12. *High Efficiency Solar PV Modules*
  13. *Advanced Chemistry Cell (ACC) Battery*
  14. *Drones and Drone Components*
- *Fund Allocation → **~₹1.97 lakh crore** (approved outlay across schemes)*



16. NAKSHA scheme launched to modernise urban land records

Why in News?

The government has rolled out a pilot NAKSHA programme to digitise and map urban land records using spatial technologies.

CONCEPT CHECK:

Q. Consider the following statements regarding NAKSHA and SVAMITVA schemes:

What is NAKSHA?

- *Full form: NAtional geospatial Knowledge-based land Survey of urban Habitations*
- *Under Digital India Land Records Modernisation Programme (**DILRMP**), by **DoLR (Ministry of Rural Development)***
- *1-year pilot to create accurate, GIS-integrated urban land parcel database*

Key Features & Components

- *Pilot coverage: 157 Urban Local Bodies (ULBs) in 27 States + 3 UTs*
- *Area coverage: over 4,484 sq. km approx.*
- *Citizen reach: ~1.5 crore people in pilot phase*
- ***100% central funding**; estimated pilot cost ≈ ₹194 crore*
- *Eligibility for pilot ULBs: towns with area < 35 sq km and population < 2 lakh*

Technology & Methodology

- *Uses drones, aerial imagery, GNSS / rover & field surveys*
- *Web-GIS platform for mapping and public interface*
- *Three-stage process: aerial survey → field verification / draft mapping → public objections & finalisation*
- *Capacity building: training modules in GNSS, Web-GIS, land parcel mapping, legal aspects*

1) *Both are under the Ministry of Panchayati Raj.*
2) *NAKSHA covers urban areas, whereas SVAMITVA focuses on rural inhabited areas.*
3) *Both use drones and GIS technology for mapping land parcels.*
4) *Only SVAMITVA has provision for issuing property cards.*

Which of the statements given above is/are correct?
(a) 2 and 3 only
(b) 1, 2 and 3 only
(c) 2, 3 and 4 only
(d) 1, 2, 3 and 4

***Hint:** Look carefully at the nodal ministry of NAKSHA.*

Other Similar Schemes

SVAMITVA Scheme (Survey of Villages and Mapping with Improvised Technology in Village Areas)

- *Launched: April 2020, by **Ministry of Panchayati Raj***
- *Objective: Provide rural property owners record of rights through drone survey & GIS mapping*
- *Coverage: ~2.5 lakh villages mapped till 2025 (using drones)*
- *Deliverables: Property cards, GIS-based village maps*
- *Status: Extended till 2025-26 to cover all rural inhabited areas*

Bhu-Aadhaar (Unique Land Parcel Identification Number – ULPIN)

- *Launched: Pilot in 2021, scaling under DILRMP(Digital India Land Records Modernisation Programme)*
- *Nodal: Dept. of Land Resources, Ministry of Rural Development*
- *Aim: Assign 14-digit alphanumeric unique ID to every land parcel, linked with geo-coordinates*
- *Analogy: Aadhaar for land parcels*
- *Benefit: Removes duplication, enables interoperability between states, ensures transparency*
- *Status: Implemented in 27 States/UTs, target pan-India roll out*

State-Level Initiatives

- ***Dharani Portal (Telangana)** → Integrated land records + registration + GIS-based services*
- ***Banglar Bhumi (West Bengal)** → Online access to RoR, cadastral maps*
- ***Bhoomi Project (Karnataka)** → First state to digitise RoR (2000s)*
- ***Apna Khata (Rajasthan)** → Online access to Jamabandi / land records*

17. World Bank launches "Business Ready (B-READY) 2024" as successor to Doing Business

Why in News?

The first edition of the B-READY report was released, assessing business climates across economies via a revamped framework.

What is B-READY 2024?

- *New flagship benchmarking tool by **World Bank** replacing Doing Business.*
- *Evaluates regulatory framework, public services, and operational efficiency across firms' life cycle.*
- ***Covers ten core topics:** Business Entry, Business Location, Utility Services, Labor, Financial Services, International Trade, Taxation, Dispute Resolution, Market Competition, Business Insolvency.*

CONCEPT CHECK:

Q. Which of the following is not a core "topic" assessed under the B-READY framework?
(a) Business Location
(b) Market Competition
(c) Digital Infrastructure
(d) Business Insolvency

- *Incorporates cross-cutting themes: digitalization, environmental sustainability, gender sensitivity.*
- *Uses ~1,200 indicators combining expert questionnaires + enterprise survey data.*

Key Features & Comparisons vs Doing Business

- *No single aggregate ranking; uses scores rather than ranking order to reduce distortion.*
- *Greater emphasis on service delivery, implementation gaps, not just de jure rules.*
- *More robust data integrity safeguards relative to controversies that hit the Doing Business report.*
- ***India & B-READY: Current Status:** India not part of initial 2024 cohort; expected to be included around 2026.*

***Hint:** Think of which term is theme vs topic in B-READY.*

 # How do you think India will perform in B-READY?

Other Reports by World Bank

- ***World Development Report (WDR)** → Annual; thematic focus (2023 → Migrants, Refugees, Societies; 2024 → Data for Better Lives)*
- ***Global Economic Prospects (GEP)** → Biannual; forecasts for global & regional economies*
- ***Poverty and Shared Prosperity Report** → Biennial; measures extreme poverty trends & inequality*
- ***World Development Indicators (WDI)** → Annual; statistical compendium of global development data*
- ***International Debt Report (IDR)** → Annual; covers debt of low- & middle-income economies*
- ***Commodity Markets Outlook** → Biannual; tracks prices of oil, metals, agri commodities*
- ***Logistics Performance Index (LPI)** → Biennial; global trade logistics efficiency (2023 latest)*
- ***Ease of Living Index** (urban/infra related studies) → In collaboration with other agencies*
- ***Little Data Book on Climate Change** → Climate statistics & country performance*
- ***Global Financial Development Report (GFDR)** → Annual; stability & inclusion in financial system*
- ***Universal Health Coverage Global Monitoring Report** (with WHO) → Tracks UHC progress*
- ***Global Findex Database** → Every 3 years; financial inclusion indicators (2021 latest)*
- ***Women, Business and the Law (WBL)** → Annual; laws & regulations affecting women's economic participation*
- ***Enabling the Business of Agriculture (EBA)** → Periodic; regulations affecting agriculture & food sectors*
- ***Global Investment Competitiveness Report** → Periodic; investment trends & policies*

18. ***LEADS 2024 Report Released: State-wise Logistics Performance Benchmarked***

Why in News?

The Ministry of Commerce & Industry released the 6th edition of the LEADS (Logistics Ease Across Different States) 2024 report.

Key Features & Framework of LEADS 2024

- *6th edition of LEADS, by **DPIIT / Ministry of Commerce & Industry***
- *Inspired by World Bank's Logistics Performance Index but includes objective + perception metrics*
- *Assesses States/UTs across **four pillars:***
  - *Logistics Infrastructure*
  - *Logistics Services*
  - *Operating & Regulatory Environment*
  - *Sustainable Logistics (new in 2024)*
- *Introduces more objective indicators, e.g. accessibility to terminals, speed on road corridors*
- *Encourages States/UTs to prepare action plans, leverage PPPs, adopt digitalisation & green logistics*
- *Emphasis on inclusion (women in logistics), multi-modal hubs, AI/ML, data analytics*

CONCEPT CHECK:

Q. Which of the following is not one of the four pillars on which the LEADS 2024 report assesses state/UT logistics performance?
(a) Logistics Infrastructure
(b) Logistics Services
(c) Operating & Regulatory Environment
(d) Trade Facilitation & Foreign Direct Investment

***Hint:** Think of the new pillar added in 2024 and what remains from previous editions.*

 # Where's your State there?

State / UT Performance Highlights

- *States/UTs are grouped regionally (Coastal, Landlocked, North-Eastern, Union Territories)*
- *Within groups, labelled as "Achievers", "Fast Movers", "Aspirers"*

Category	Achievers	Fast Movers	Aspirers
Coastal States	Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu	Andhra Pradesh, Goa	Kerala, West Bengal
Landlocked States	Haryana, Telangana, Uttar Pradesh, Uttarakhand	Bihar, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan	Chhattisgarh, Jharkhand
North-Eastern States	Assam, Arunachal Pradesh	Meghalaya, Mizoram, Nagaland, Sikkim, Tripura	Manipur
Union Territories	Chandigarh, Delhi	Dadra & Nagar Haveli & Daman & Diu, Jammu & Kashmir, Lakshadweep, Puducherry	Andaman & Nicobar Islan Ladakh

19. Reclassification of Barytes, Felspar, Mica & Quartz as Major Minerals

Why in News?

On 20 February 2025, the Ministry of Mines reclassified Barytes, Felspar, Mica and Quartz from minor to major minerals.

Reclassification of Minerals under MMDR Act, 1957

Legal & Policy Framework

- *The reclassification is via a Gazette notification issued on 20 February 2025.*
- *These minerals will now be regulated under the **Mines and Minerals (Development & Regulation) Act, 1957** as major minerals.*
- *Existing leases are not adversely affected; lease periods extended up to 50 years (or till renewal period) under Section 8A of MMDR Act.*
- *A transition window of 4 months is provided (till 30 June 2025) for compliance and regulatory alignment.*

Rationale & Strategic Impetus

- *These minerals (Quartz, Felspar, Mica) occur in pegmatites along with **critical minerals** such as Lithium, Beryl, Niobium, Tantalum, etc.*
- *Under minor-mineral leases, associated critical minerals often remained unreported/unexploited.*
- ***Barytes** has key industrial uses (oil drilling, radiation shielding, electronics) and co-occurs with metals like Cobalt, Silver, Copper.*
- *The shift is aligned with the **National Critical Mineral Mission** approved on 29 January 2025.*

Key Changes & Impacts

- ***Regulation & Oversight:** Mines will register with Indian Bureau of Mines (IBM) and comply with stricter regulatory norms.*
- ***Lease Terms:** Up to 50 years; existing leases get extension equivalently.*
- ***Revenue:** Continue accruing to State Governments.*

CONECPT CHECK:

Q. Under the MMDR Act, which of the following correctly differentiates major and minor minerals in terms of governance?

(a) Major minerals are regulated by States; Minor minerals by Centre

(b) Major minerals' royalty is fixed by Centre; Minor minerals' royalty is fixed by States

(c) Both are regulated by Centre, but with differential revenue sharing

(d) Both are regulated by States, but Centre has overriding power

 # Favourite topic of UPSC

STATIC CONNECT:

Mines & Minerals (Development & Regulation) Act, 1957 (MMDR Act)

Key Facts

- *Regulates → mining & development of minerals (excl. oil, gas).*
- *Major vs Minor minerals → Major = Centre rules; Minor = State rules.*

- *Mineral concessions → Reconnaissance, Prospecting, Mining lease, Composite licence.*
- *Funds → DMF (for locals, 2015), NMET (National Mineral Exploration Trust).*
- *Royalty rates → in **2nd Schedule***

MMDR (Amendment) Act, 2025 – Key Provisions

- ***Critical minerals** → Added in First Schedule (central auction only).*
- ***Captive mines** → 100% sale of output allowed (earlier ≤50%).*
- *NMET → NMEDT → Expanded scope (exploration + development, incl. offshore/foreign) ; contribution ↑ 2% → 3% royalty.*
- ***Area extension** → One-time expansion (10–30%) for deep-seated minerals (>200m).*
- ***Addition of minerals** → Leaseholders can add new minerals in same area (no extra charge in some cases).*
- ***Mineral exchanges** → Legalised for trading minerals; regulated to avoid insider trading, ensure transparency.*

Aspect	***Major Minerals***	***Minor Minerals***
Definition	*All minerals except those notified as "minor"*	*Minerals notified as "minor" under Section 3(e) of MMDR Act*
Examples	*Coal, iron ore, bauxite, copper, gold, mica, limestone, manganese*	*Building stones, gravel, ordinary clay, ordinary sand, marble, slate, brick-earth*
Regulation	*By **Central Govt** (rules, royalty, auctions)*	*By **State Govts** (rules for concessions, rates, royalties)*
Royalty rates	*Fixed by Centre (2nd Schedule of MMDR Act)*	*Fixed by States*
Concession Grant	*Through **auctions** (mandatory since 2015)*	*States grant leases/quarry permits*
Revenue beneficiary	*Shared by Centre & States*	*Entirely with States*
Recent Update	*2025 Amendment → critical minerals (major) brought under central auction*	*States continue exclusive control; no change*

20. Gross Domestic Knowledge Product (GDKP)

Why in News?

MoSPI held a session on the "Conceptual Framework of GDKP Measurement" to explore how to formally define and estimate India's knowledge economy.

What is GDKP?

- *A proposed metric to quantify the economic value of knowledge creation, distribution, and use in an economy.*
- *It aims to supplement (not replace) GDP by capturing intangible contributions from innovation, education, research, intellectual property, digital services, etc.*
- ***Based on four pillars:** knowledge items, producers, distributors, and users (consumers/enhancers).*
- *Knowledge items may be tangible (books, devices) or intangible (online courses, patents, software)*

CONCEPT CHECK:

Q. Which of the following best captures the unique aspect of GDKP that distinguishes it from GDP?

(a) It replaces the expenditure approach of GDP with an income-based approach.

(b) It attempts to quantify the value of knowledge creation, distribution and use, including intangible items, which GDP does not fully capture.

(c) It treats all intellectual property products as final consumption rather than capital formation.

(d) It excludes all physical goods and focuses solely on digital services.

***Hint:** Look for what GDP cannot capture well.*

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Day 06	Financial Statements (Balance Sheet)
Day 07	Partnerships
Day 08	Not-for-Profit Organisations
Day 09	Companies (Share Capital, Debentures, Financial Ratios)
Day 10	Companies (Financial Statements of Companies)
Day 11	Overview+ new laws/old laws
Day 12	Definition of workmen, employees
Day 13	Trade Unions
Day 14	Strikes and Lockouts, Retrenchment
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Day 17	Insurance
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EPFO_2502	31 Aug	INDIAN CULTURE AND HERITAGE(40)+INDIAN FREEDOM STRUGGLE (40)+ CA(20)+ ENGLISH(10)+GEN. SCIENCE (10)
EPFO_2503	07 Sept	ECONOMY & GLOBALIZATION (80)+ CA(20)+ ENGLISH(10)+GEN. SCIENCE (10)
EPFO_2504	14 Sept	ENGLISH(30) + CA(60)+GEN. SCIENCE (30)
EPFO_2505	21 Sept	GENERAL MENTAL ABILITY AND QUANTATIVE APTITUDE(60)+ CA(30)+ ENGLISH(10)+GEN. SCIENCE (30)
EPFO_2506	28 Sept	INDUSTRIAL AND LABOUR LAWS(60)+SOCIAL SCURITY(60)
EPFO_2507	05 Oct	GENERAL ACCOUNTING PRINCIPLES,ACCOUNTING AND AUDITING(100)+ CA(20)
EPFO_2508	12 Oct	FULL SYLLABUS
EPFO_2509	26 Oct	FULL SYLLABUS
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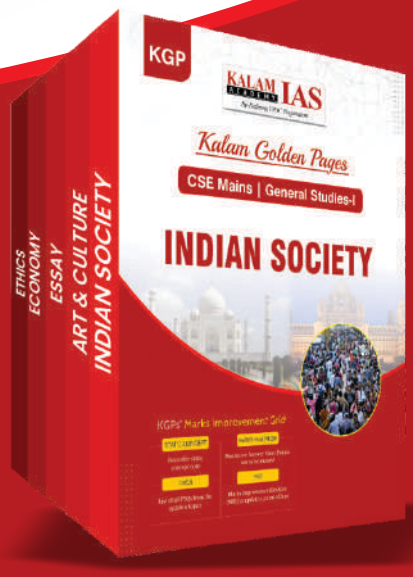

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AGRICULTURE

21. Makhana Board launched in Bihar under Budget 2025-26

Why in News?

Union Budget 2025-26 proposed establishment of a Makhana Board in Bihar to boost production, processing, value addition and marketing of makhana.

Makhana Board in Bihar

Key Provisions & Features (as per Budget / Govt announcements)

- *Board to be established in Bihar → to improve production, processing, value addition, marketing.*
- *Organize stakeholders into FPOs for better scale, coordination.*
- *Provide handholding, training support to makhana farmers.*
- *Ensure farmers can access existing central schemes via the Board.*
- *Budget allocation: ₹100 crore for makhana sector in FY 2025-26.*

Recent Updates

- *PM Narendra Modi inaugurated the National Makhana Board in Purnea, Bihar, approving ~₹475 crore development package.*
- *Bihar Agricultural University started an "Organic Makhana Cultivation Programme" (OMCP) to modernize cultivation in Kosi belt.*

CONCEPT CHECK:

Q. Suppose that traditional makhana cultivation yields ~1.8 tonnes per hectare in Bihar, but with scientific methods and improved varieties yields can reach ~3.0 tonnes/ha. Assume that the Makhana Board enables 40 % of the existing makhana area to shift to improved methods in the next 5 years. If the current area under makhana is 50,000 ha, what is the approximate additional output (in tonnes) that could be achieved (over the base traditional output) by that shift?

(a) 10,000 tonnes
(b) 18,000 tonnes
(c) 24,000 tonnes
(d) 36,000 tonnes

Hint: *Numerical in GS is new innovation. Be prepared for surprises* 😂

STATIC CONNECT:

Makhana (Fox Nut / Gorgon Nut / Phool Makhana)

- *Botanical name → Euryale ferox (family: Nymphaeaceae, water lily family)*
- *Origin → **Eastern Asia (India, China, Japan)***
- *Nature → Aquatic, prickly-water plant, grows in stagnant water bodies*
- *Edible part → Black seeds inside prickly fruit; after processing → popped white puff ("phool makhana")*
- *Nutritional value → Rich in protein, carbs, fiber, Ca, Mg, P, Fe, amino acids*
- *Uses → Snacks, sweets, Ayurvedic medicine (anti-oxidant, anti-aging, fertility support, kidney health)*
- *Market tag → Called a **"superfood",** exports rising*

Makhana Farming in India

- *Major producer → **Bihar (~90% of India's output)***
- *Other states → Assam, Manipur, Jharkhand, West Bengal, Odisha, Eastern UP*
- *Bihar belts → Mithilanchal, Kosi-Seemanchal, Darbhanga, Purnea, Katihar*
- *Productivity → 1.5–2.5 t/ha (traditional), ↑ with scientific methods (up to 3 t/ha)*

Cultivation Practices

- *Environment → Stagnant perennial ponds, wetlands, oxbow lakes (mauns, chaurs, ahars)*
- *Crop cycle → **Sown Dec–Jan → harvested July–Sept***

- *Seeds → Sown in shallow ponds; fruits harvested manually using bamboo poles*
- *Labour-intensive → Seeds are thorny, extracted underwater → dried → roasted → popped manually*
- *Challenges → Primitive processing, water management issues, labour shortages, fragmented ponds*

Government & Institutional Support

- *GI Tag → **"Mithila Makhana"** (2022)*
- *Support Schemes →*
  - *National Food Security Mission (NFSM) included makhana (2018)*
  - *Krishi Vigyan Kendras (KVKs) in Bihar promote improved varieties & processing*
  - *Bihar Agricultural University (BAU), Sabour → Developed high-yielding varieties (e.g. Swarnava, Sabour Makhana-1)*
- *Budget 2025-26 → Constitution of Makhana Board in Bihar*
- *Exports → Shakti Makhana, Manohar Makhana brands entering global markets*

22. Mission for Aatmanirbharta in Pulses launched

Why in News?

Union Budget 2025-26 allocated ₹1,000 crore for a six-year mission to achieve self-reliance in pulses (tur/arhar, urad, masoor).

Key Features & Objectives

- ***Focus crops:*** *tur / arhar (pigeon pea), urad (black gram), masoor (red lentil)*
- ***Procurement:*** *NAFED & NCCF to procure "as much as offered" from registered farmers under MSP-based procurement for 4 years*
- ***Post-harvest & storage:*** *emphasis on warehousing, reducing losses*
- *R&D & seed development: boost high-yielding, climate-resilient, pest/disease tolerant pulse varieties*
- ***Expansion of acreage & intensive use:*** *bring fallow / rice-fallow lands, intercropping, district clustering*

Rationale / Context

- *India is world's leading pulse producer but still **depends on imports**—import dependence was ~10.4% in 2022-23.*
- *Pulse imports surged in 2023-24 (drought year), reversing earlier gains; in April–Nov 2024, imports valued at $3.28 billion (↑56.6% over last year)*
- *Budget's mission is launched against this backdrop to stabilize supply, curb import bills, ensure farmers' income.*

CONCEPT CHECK:

Q. Which of the following is not one of the primary focus crops under the Mission for Aatmanirbharta in Pulses?
(a) Tur / Arhar
(b) Urad
(c) Masoor
(d) Chana

Hint: *The mission targets only three pulses.*

 # What all pulses are there in your kitchen? Are they covered under the scheme?

STATIC CONNECT:

Pulses in India

Significance

- *Protein-rich staple → nutrition security*
- ***Nitrogen fixation** → soil fertility*
- *Covered under **Essential Commodities Act***

Production

- *India = **largest producer & consumer***
- *2024-25 est. output → ~25.23 Mt (↑4%)*
- *Still short of demand → heavy imports*

23. India launches 21st Livestock Census (2024–25)

Why in News?

MoA&FW's Department of Animal Husbandry & Dairying (DAHD) began 21st nationwide Livestock Census on 25 Oct 2024.

Conduct of Livestock Census

- *Published by **DAHD, Ministry of Agriculture & Farmers Welfare***
- ***First census: 1919** → conducted **every 5 yrs** (quinquennial)*
- ***20th census:** 2019 → total livestock 535.78 mn (↑4.6% over 2012)*
- ***21st census reference date:** 1 Sept 2024 → enumeration till 31 Dec 2024*
- *Completion target: Mar 2025 → reports (All-India & State/UT) to follow*

Scope & Coverage

- ***Species:** cattle, buffalo, goat, sheep, pig, camel, horse, donkey, yak, mithun, dog, rabbit, elephant, etc. + poultry*
- *All households, farms, gaushalas, defence units, institutions covered*
- *Stray animals (cattle, dogs) also enumerated*
- *Workforce: ~87,000 enumerators → ~30 cr households targeted*

Key Features / Innovations (21st Census)

- *100% digital → Mobile App (offline + online sync), GPS, dashboards*
- *Breed-wise data → 219 recognised indigenous & exotic breeds*
- *New inclusions:*
  - *Pastoralists & migratory herds*
  - *Gender of stray cattle*
  - *Households with livestock as primary income*
- *Quality checks → 5% post-enumeration survey, software validation, breed-photo aids*
- *Data harmonised with FAO classifications for international reporting*

Key Findings

- *Livestock share in Agri GVA: ~30.23 % (↑ from 24.38 % in 2014-15)*
- ***Milk production:** 239.3 mn tonnes (2023-24) → **world's largest producer** (UP>Rajasthan>Gujarat>Maharashtra)*
- ***Eggs:** 142.8 bn (2023-24) → steady ↑ (CAGR ~6.9%) (Andhra Pradesh>TN>Telangana)*
- ***Meat:** 10.25 mn tonnes (2023-24)(WB>UP>Maharashtra)*
- ***Wool:** 33.7 mn kg (2023-24) → overall ↓ trend (Rajasthan>J&K>Gujarat)*
- ***Milk yield:** Exotic cows (9.8 kg/day) > Crossbred (8.3 kg) > Indigenous (4.2 kg)*
- ***Species contribution in milk (2023-24):** Buffaloes ~45% > Crossbred/exotic cattle ~33% > Indigenous cattle ~21% > Goats ~3%*

CONCEPT CHECK:

Q. Livestock sector in India has shown faster growth compared to the crop sector in recent years. Which of the following factors can best explain this trend?

1) Shift in dietary patterns towards protein-rich foods
2) Policy push through schemes such as Rashtriya Gokul Mission and National Livestock Mission
3) Mechanisation of agriculture reducing demand for draught animals
4) Higher resilience of livestock income compared to crop income in face of climate variability

(a) 1, 2 and 4 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, 3 and 4

***Hint:** Consider both demand-side (nutrition transition) and supply-side (schemes, resilience).*

 # Seems counting animals are easier than counting people.

GEOGRAPHY & ENVIRONMENT

24. Indore & Udaipur become first Indian "Wetland Cities"

Why in News?

Indore (MP) and Udaipur (Rajasthan) have been officially accredited as Wetland Cities under the Ramsar Convention.

Wetland City Accreditation (WCA) – Overview

- *Voluntary scheme under **Ramsar Convention** introduced at COP 12 (2015)*
- *Aims to recognize cities with exemplary urban-wetland conservation, wise use, restoration, integration into planning*
- *Accreditation is valid for **6 years** (renewal possible if city continues to meet criteria)*
- *Cities must satisfy **six criteria** (presence of wetlands, conservation measures, restoration, planning integration, stakeholder involvement, etc.)*

City-specific Wetland Assets & Efforts

- ***Indore***
  - ***Sirpur Lake:** ~800 acres, designated Ramsar wetland (since 2022)*
  - *Efforts to remove encroachments, restore wetland ecology*
- ***Udaipur***
  - *Surrounded by five major lakes/wetlands: **Pichola, Fateh Sagar, Rang Sagar, Swaroop Sagar, Doodh Talai***
  - *These wetlands are integral to Udaipur's culture, microclimate, tourism value*

CONCEPT CHECK:

Q. Which one of the following is not among the criteria that a city must satisfy to be eligible for Wetland City Accreditation (WCA) under the Ramsar Convention?

(a) Existence of one or more wetlands (natural or human-made) within or adjacent to the city boundary

(b) A formal strategy or master plan integrating the wetland(s) into urban planning

(c) Demonstrable evidence of zero human disturbance or interference in the wetland(s)

(d) Stakeholder engagement (local communities, NGOs) in wetland governance

***Hint:** WCA requires "wise use" and management, not pristine non-interference.*

STATIC CONNECT:

Ramsar Convention on Wetlands

- *Adopted → 1971 at Ramsar, Iran*
- *Entered into force → 1975*
- *First global treaty on conservation & wise use of wetlands*
- *Secretariat → Gland, Switzerland (hosted by IUCN)*

Ramsar Sites

- *Criteria → 9 ecological/biological criteria (ex: presence of threatened spp., migratory birds, fish spp. etc.)*
- ***Montreux Record** → List of sites needing urgent conservation attention (2 Indian sites: Keoladeo NP, Loktak Lake)*
- *Benefits → ↑ intl. recognition, funding access, sustainable mgmt. support*

India & Ramsar

- *India → Signatory since 1982*
- *No. of Ramsar Sites (as of Sept 2025) → **91** (largest in South Asia)*
- *Area covered → ~16,000+ sq. km*
- *Largest site → **Sunderbans Wetland** (W. Bengal, ~4230 sq. km)*
- *Smallest site → **Renuka Wetland** (HP, 0.2 sq. km)*
- *2022 → record 49 new sites designated (Azadi Ka Amrit Mahotsav drive)*
- *National Authority → Ministry of Environment, Forest & Climate Change (MoEFCC)*

India added 2 new Ramsar sites in 2025

- *On 4 June 2025, **Khichan (Phalodi, Rajasthan)** and **Menar (Udaipur, Rajasthan)** were designated as Ramsar wetlands.*
- *These additions brought India's total Ramsar sites to 91 in 2025.*

25. Vulture Conservation in India: Nimesulide Painkiller Banned

Why in News?

*Union Government has officially **banned the veterinary use of nimesulide** after research confirmed it is lethal to vultures.*

Background: Vulture Crisis in India

- *India once hosted tens of millions of vultures; populations collapsed (> 99 % decline) in recent decades.*
- *Primary culprit: **NSAIDs** used in livestock (notably **diclofenac**) causing renal failure in vultures feeding on carcasses.*
- *Vultures are ecologically crucial scavengers — removing carcasses, limiting disease spread, controlling feral dog populations.*

Evolution of Drug Regulation for Vulture Safety

- ***2006:** India bans veterinary use of diclofenac.*
- ***To curb misuse, in 2015**, multi-dose human diclofenac vials > 3 ml were prohibited to deter off-label use in cattle.*
- *Subsequent research found **aceclofenac and ketoprofen** also harmful to vultures → these were later banned or restricted.*
- ***January 2025:** Gazette notification issued banning manufacture, sale, distribution of **veterinary nimesulide** nationwide.*

CONCEPT CHECK:

Q. Which of the following best explains why the decline of vultures in India led to an increase in feral dog populations?
(a) Reduced predation pressure on dogs by larger raptors
(b) Availability of untreated cattle carcasses as food for dogs
(c) Habitat encroachment forcing dogs into urban areas
(d) Lack of rabies vaccination programs in rural India

***Hint:** Think food chain replacement when scavengers disappear.*

STATIC CONNECT:

Vultures in India

Species	IUCN Status	WPA 1972	CITES	Distribution in India	Key Features
White-rumped vulture *(Gyps bengalensis)*	***CR***	*Sch. I*	*App. II*	*Gangetic plains, Assam, Terai, Peninsular India*	*Most affected by diclofenac; sharpest decline (~99%)*
Indian vulture (Long-billed) *(Gyps indicus)*	***CR***	*Sch. I*	*App. II*	*Peninsular India (Deccan, MP, Rajasthan, Gujarat)*	*Endemic; prefers cliffs for nesting*
Slender-billed vulture *(Gyps tenuirostris)*	***CR***	*Sch. I*	*App. II*	*Gangetic plains (Bihar, UP, Assam, NE states)*	*Restricted range; close relative of Indian vulture*
Red-headed vulture (King vulture) *(Sarcogyps calvus)*	***CR***	*Sch. I*	*App. II*	*Forested areas of central & NE India, Terai*	*Solitary feeder; bald red head distinctive*
Egyptian vulture *(Neophron percnopterus)*	***EN***	*Sch. IV*	*App. II*	*Widespread (Punjab, Rajasthan, Gangetic plains, South India); migratory in some regions*	*Smaller; uses tools (stones to crack eggs)*
Himalayan griffon *(Gyps himalayensis)*	***NT***	*Sch. IV*	*App. II*	*High Himalayas (Ladakh, Uttarakhand, Sikkim, Arunachal)*	*Largest Gyps species; altitudes >3000m*
Cinereous vulture (Monk) *(Aegypius monachus)*	***NT***	*Sch. I*	*App. II*	*Winter visitor: Himalayas, Rajasthan, Gujarat*	*Dark plumage; among heaviest raptors*
Bearded vulture (Lammergeier) *(Gypaetus barbatus)*	***NT***	*Sch. IV*	*App. II*	*Himalayas (J&K, Himachal, Uttarakhand, Sikkim, Arunachal)*	*"Bone breaker" – drops bones from height*
Eurasian griffon *(Gyps fulvus)*	***LC*** *(globally)*	*Sch. IV*	*App. II*	*Rare winter migrant (NW India, Rajasthan, Gujarat)*	*Not a regular breeder in India*

Quick Prelims Facts

- ***Resident breeding species (5):** White-rumped, Indian, Slender-billed, Red-headed, Egyptian*
- ***Migratory/occasional visitors (4):** Himalayan griffon, Cinereous, Bearded, Eurasian griffon*
- ***Hotspots in India →***
  - *Rajasthan (Jorbeer, Jaisalmer)*

- *MP (Panna, Bandhavgarh, Satpura, Pachmarhi)*
- *Assam & NE India (Kaziranga, Nameri)*
- *Gujarat (Gir, Velavadar, Kutch)*
- *Karnataka (Ramadevarabetta Sanctuary – 1st vulture sanctuary)*

26. MP to translocate 15 tigers to Rajasthan, Odisha & Chhattisgarh

Why in News?

MP govt has approved the interstate relocation of 15 tigers under an animal-exchange programme to bolster tiger populations in other states.

Inter-State Tiger Translocation: Concept & Rationale

- *Strategy to relieve overpopulation pressure in source reserves and to restock tiger numbers in habitats with low density*
- *Aims to enhance genetic diversity, reduce intra-species conflict, and ensure more balanced spatial distribution*
- *Must follow scientific protocols: habitat assessment, prey base, veterinary supervision, post-release monitoring*

Details of the MP Proposal

- *Source reserves: Bandhavgarh, Pench, Kanha in Madhya Pradesh*
- *Total: 15 tigers (12 tigresses + 3 males)*
- *Destination distribution:*
  - *Chhattisgarh: 6 tigresses + 2 males*
  - *Rajasthan: 4 tigresses*
  - *Odisha: 2 tigresses + 1 male*
- *Receiving states will bear translocation costs*
- *No fixed timeline yet for execution*
- *Approval from central authorities (NTCA / MoEFCC) essential*

CONCEPT CHECK:

Q. Assertion (A): India hosts nearly 75% of the global wild tiger population.
Reason (R): The "core-buffer" strategy of Project Tiger has successfully expanded tiger habitat coverage to over 2.4% of India's geographical area.
(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, R is false
(d) A is false, R is true

Hint: *Core-buffer management under Project Tiger is central to India's success.*

 # What is status of Cheetahs from Africa?

STATIC CONNECT:

Tiger in India

- *Panthera tigris tigris (Bengal tiger in India)*
- *IUCN:* ***Endangered***
- *CITES:* ***Appendix I***
- *WPA 1972:* ***Schedule I***
- ***Project Tiger*** *(1973) → NTCA nodal*
- *Status: AITE 2022 → 3,167 tigers; 3,080 photo-captured*
- *↑ in Central India, Shivalik; ↓ occupancy in parts of Western Ghats*
- *Tiger population ↑, but uneven across landscapes*

Project Tiger	***National Tiger Conservation Authority (NTCA)***

• ***Launched:*** *1973, Jim Corbett NP → 1st reserve*
• ***Aim:*** *in-situ conservation of tigers → core-buffer model*
• ***Funding:*** *Centrally Sponsored Scheme (Centre + State)*
• ***Components:***
  ○ *Habitat improvement & prey augmentation*
  ○ *Relocation of villages from core areas*
  ○ *Eco-development in buffer zones*
  ○ *Anti-poaching infrastructure & M-STrIPES monitoring*
• ***Coverage:*** *9 reserves (1973) → 58 reserves in 2025, area ~75,000 km² (~2.4% of India's geographical area)*
• ***58th reserve:*** *Madhav NP, Madhya Pradesh (2025)*
	• ***Statutory body under WPA 1972*** *(amend. 2006)*
	• *Nodal for Project Tiger implementation*
	• ***Composition:***
	  ○ ***Chairperson*** *→ Minister (MoEFCC)*
	  ○ ***Vice-Chairperson*** *→ Minister of State (MoEFCC)*
	  ○ ***Members*** *→ MPs, experts, wildlife officers, NGOs*
	• ***Key functions:***
	  ○ *Approval of tiger conservation plans of states*
	  ○ *Notification/approval of tiger reserves*
	  ○ *Fixing inviolate core areas & eco-sensitive buffer zones*

• ***Success:*** *India has ~75% of world's wild tigers*	○ *Monitoring via All India Tiger Estimation (AITE) every 4 years* ○ *Coordination with CITES on illegal trade* ○ *Compensation for human-wildlife conflict deaths*

27. SC orders Rajasthan to map sacred groves & classify them under forest / community reserve regime

Why in News?

Supreme Court directs Rajasthan to map all sacred groves and notify them as forests / community reserves under WLPA 1972.

Sacred Groves / Orans – Nature & Importance

- *Known locally in Rajasthan as **"orans", "dev-vans", "rundhs".***
- *Estimated ~ 25,000 orans in Rajasthan, covering ~ 6 lakh hectares.*
- *Serve ecological functions: biodiversity hotspots, soil & water conservation, microclimate regulation.*
- *Cultural & religious significance: conserved by communities via customary norms, taboos, rituals.*

Legal / Statutory Frameworks

- ***Wildlife Protection Act, 1972:** Section 36C: Allows declaration of "community reserves" to protect areas on private / community lands. SC wants groves notified as community reserves.*
- ***Forest (Conservation) Act, 1980:** SC treating orans as "forests" so that FC Act protections apply (regulation of non-forest use)*
- ***T.N. Godavarman judgment (1996):** Broadens definition of "forest land" beyond mere tree cover, to areas recorded as forest etc. SC relies on this to bring orans under forest regime.*
- ***Forest Rights Act, 2006 (FRA):** Recognises community forest rights, management rights under Gram Sabhas over customary community forests → potential conflict with transferring control to forest dept.*

Supreme Court Directives & Mandates

- *Rajasthan Forest Dept must perform detailed on-ground + satellite mapping of each sacred grove.*
- *All sacred groves, irrespective of size, should be classified as "forests" and notified as "community reserves" under WLPA.*
- *A 5-member committee (including domain expert, forest & revenue dept officers, MoEFCC rep) to oversee implementation.*
- *MoEFCC to put in place a national policy for governance/management of sacred groves and a nationwide survey.*

***CONCEPT CHECK**:*

Q. Under the Wildlife Protection Act, 1972, which of the following features correctly describe Community Reserves?

1) They can be declared only on government-owned land.
2) They provide a legal framework to conserve biodiversity on private or community lands.
3) Local communities may continue traditional practices compatible with conservation.

Select the correct answer using the codes below:
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

***Hint:** Community Reserves are specifically for private/community lands, unlike National Parks & Sanctuaries.*

 # Read about sacred groves in other states.

28. Record January heat despite La Niña emergence

Why in News?

January 2025 recorded the warmest global average for that month, even though La Niña (which usually cools) began emerging in December 2024.

Temperature Trends & ENSO Context

- *January 2025 averaged **13.23 °C, about 0.79 °C above 1991–2020**, exceeding Jan 2024's El Niño record.*
- *Record occurred despite emerging La Niña, whose cooling effect was not yet strong.*
- *Anthropogenic warming and ocean–atmosphere anomalies outweighed the expected La Niña cooling.*

Implications & Signals

- ***ENSO influence is weakening** relative to long-term warming.*
- *Even La Niña cannot offset high baseline warming, raising risk of records without El Niño.*

CONCEPT CHECK:

Q. In the context of ENSO teleconnections, which of the following are correctly matched?

1) El Niño → Droughts in India, floods in Peru
2) La Niña → Floods in Australia, drought in East Africa
3) El Niño → Suppressed Atlantic hurricanes, enhanced Pacific cyclones

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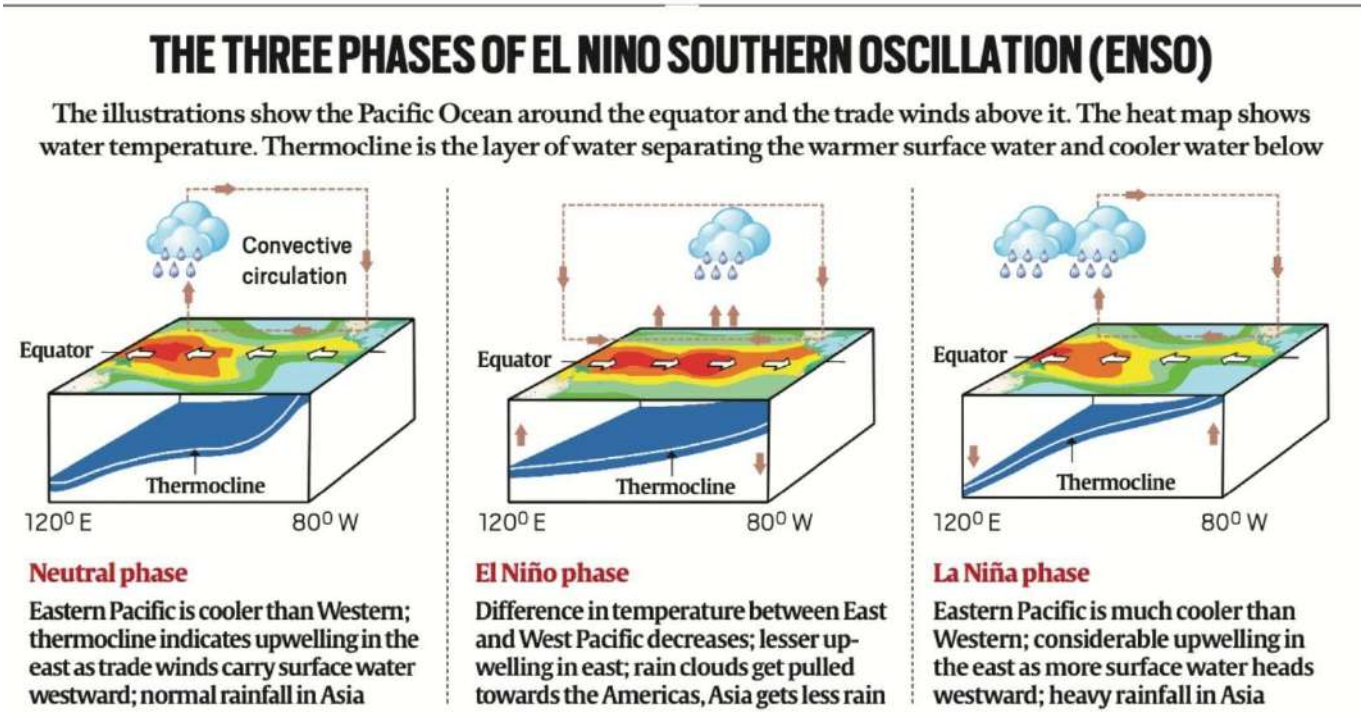
- *Underscores need for stronger mitigation and adaptation; improves model understanding of ENSO vs GHG forcing.*

4) La Niña → Stronger Indian Southwest monsoon

Select the correct combination:
(a) 1 and 2 only
(b) 1, 3 and 4 only
(c) 2 and 4 only
(d) 1, 2, 3 and 4

STATIC CONNECT:



Feature	***El Niño***	***La Niña***
Trade Winds	*Weak / Reverse*	*Stronger than normal*
Oceanic Condition	*Warm water shifts E. Pacific → ↓ upwelling*	*Warm water pushed further W. Pacific → ↑ upwelling E. Pacific*
SST Anomaly	*≥ +0.5°C for 5+ months*	*≤ –0.5°C for 5+ months*
Walker Circulation	*Weakens → convection shifts eastward*	*Strengthens → convection over W. Pacific*
Global Temp Impact	*Warming effect (↑ global avg.)*	*Cooling effect (↓ global avg.)*
Rainfall – India	*↓ SW monsoon → drought risk*	*↑ SW monsoon → flood risk*
Cyclones	*↑ Pacific cyclones, ↓ Atlantic hurricanes*	*↓ Pacific cyclones, ↑ Atlantic hurricanes*
ENSO Teleconnections	*Alters jet streams, droughts in Australia, floods in Peru*	*Opposite effects: floods in Australia, drought in Peru*
Monitoring Index	*Oceanic Niño Index (ONI) ≥ +0.5°C*	*ONI ≤ –0.5°C*
Current Status (2025)	*2023–24 El Niño waned*	*La Niña likely developing, may persist through 2025*

29. North Pole records +20 °C anomaly in mid-winter, triggering ice melt

Why in News?

On February 2, 2025, temperatures at the North Pole rose over 20 °C above average, crossing the freezing point and causing winter ice melt.

Event & Causes

- *Temperature anomaly > 20 °C above January–February average in central Arctic.*
- *Absolute temperatures reached around 0 °C or slightly above, enough for ice melt.*

CONCEPT CHECK:

Q. If the AMOC were to collapse or severely weaken, which of the following regional/global impacts is least likely?
(a) Cooling of Western Europe, especially during winter

- *Triggered by a deep low-pressure system over Iceland channeling warm Atlantic air northwards.*
- *Sea surface warmth in the northeast Atlantic amplified the warming.*
- *Similar events have occurred before (e.g. February 2018) but remain rare.*

Arctic Amplification & Ice Loss Trends

- *Arctic is warming ~**4× faster** than global average since 1979 (Arctic amplification)*
- *February 2025 Arctic sea ice extent was the lowest ever recorded for that month (13.75 million km²)*
- *Global sea ice (Arctic + Antarctic) fell to a record low in February 2025 — ~16.04 million km² combined*
- *Arctic ice was ~**8 % below average**; Antarctic ice ~26 % below average in February.*
- *Ice loss contributes to feedback loops: darker ocean absorbs more solar heat → accelerates warming & further melt.*

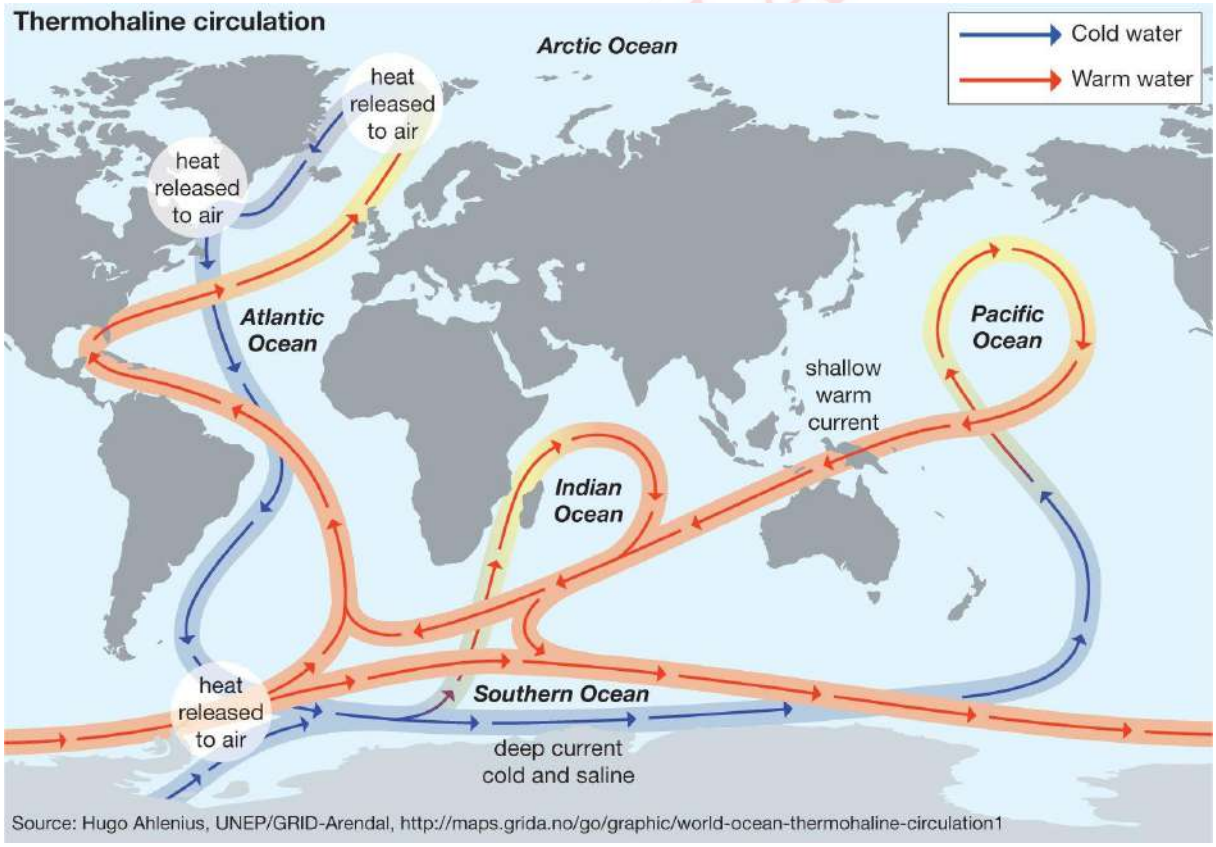
(b) Shift of tropical rainfall belts southwards
(c) Reduction in sea level rise along the US East Coast
(d) Disruption of nutrient transport and carbon uptake in the Atlantic

***Hint:** One of these is in opposite direction to expected effect of weakened AMOC.*

STATIC CONNECT:

Thermohaline Circulation

- *Global **"conveyor belt"** of ocean circulation*
- *Driven by temp (**thermo**) & salinity (**haline**) differences → density gradient*
- *Warm, less salty water → surface currents (e.g., **Gulf Stream**)*
- *Cold, salty, dense water → sinks at high latitudes (**North Atlantic, Antarctic**)*
- *Connects all major oceans → redistributes heat, nutrients, gases*
- *Time scale → ~**1000 years** for one full cycle*
- *Key role in climate regulation + **carbon cycle***



Atlantic Meridional Overturning Circulation (AMOC) Slowdown / Collapse

- *AMOC = part of Thermohaline Circulation → drives heat transport in Atlantic*
- ***Cause of risk** → ↑ Greenland ice melt (freshwater influx) + ↑ global warming*
- *Impact → weakens deep-water formation → slows/risks collapse*

- ***Recent studies →***
  - *Clear slowdown signals detected*
  - *Some models: collapse possible ~2050–2100 (uncertain)*
  - *Others: weakened but resilient AMOC this century*
- ***IPCC view →*** *slowdown likely, full collapse uncertain*
- ***Current update (2025) →*** *Collapse risk no longer "low probability" under high-emission scenarios*

30. UN declares 2025 as the International Year of Glaciers' Preservation

Why in News?

To draw global attention to glacier loss and its impact on water security, climate and ecosystems.

Background & Declaration

- *Declared by UN General Assembly in December 2022, at the proposal of Tajikistan*
- *UNESCO & WMO are designated co-chairs/co-facilitators*
- *From 2025 onward, 21 March is designated World Day for Glaciers*

CONCEPT CHECK:

The proposal to declare 2025 as International Year of Glaciers' Preservation was made by which country at the UN?

a) Nepal
(b) Switzerland
(c) Tajikistan
(d) Canada

Recent & Upcoming UN Years

- *2025 → International Year of Quantum Science & Technology*
- *2024 → International Year of Camelids*
- *2023 → International Year of Millets (India proposal, FAO lead)*
- *2022 → International Year of Basic Sciences for Sustainable Development*
- *2021 → International Year of Fruits & Vegetables (FAO lead)*
- *2020 → International Year of Plant Health (FAO lead)*
- *2019 → International Year of Indigenous Languages (UNESCO)*
- *2018 → International Year of the Reef*
- *2017 → International Year of Sustainable Tourism for Development*
- *2015 → International Year of Soils (FAO lead)*

31. Caspian Sea's water levels hit historic lows, triggering alarm

Why in News?

New data shows the Caspian Sea is shrinking faster than expected, threatening ecosystems, economies, and coastal states.

Basic Context & Trends

- *The Caspian is the world's largest inland water body (often termed "sea").*
- *Since mid-1990s, water levels have been on a downward trend.*
- *From 2006 to 2024, levels dropped ~2.14 m.*
- *Between 2020–2025, decline rate ~7 cm/year — ~20× faster than global ocean rise.*

Causes / Drivers

- *Climate change & warming → increases evaporation exceeding inflow.*
- *Reduced river discharge / diversion — Volga River provides ~80% of Caspian's inflow; damming, irrigation upstream reduce flows.*
- *Changing precipitation / runoff patterns in basin.*
- *Natural variability & tectonic factors may play a secondary role.*

CONCEPT CHECK:

Q. The rapid decline in the Caspian Sea's water level over recent decades can be best explained by a combination of which two factors?

(a) Increased evaporation due to rising temperatures + decreased inflow from major rivers via upstream diversion
(b) Tectonic uplift lowering basin capacity + increased sedimentation
(c) Sea-level rise of global oceans reducing gradient + increased precipitation in catchments
(d) Enhanced groundwater recharge under the basin + reduced human water withdrawals

Impacts & Risks

- ***Ecological stress / biodiversity loss***
  - *Endangered Caspian seals lose breeding habitat.*
  - *Sturgeon species lose river access for spawning; coastal lagoons & reed beds shrink.*
  - *Protected area coverage may collapse — e.g. from 16.8% down to 7% (at 5 m fall), and to ~1% (at 10 m).*
- ***Economic & infrastructure disruption***
  - *Ports (Aktau, Quryq in Kazakhstan; Astrakhan, Makhachkala in Russia) face navigational and dredging challenges.*
  - *Oil transport & offshore operations affected (e.g. Dubendi terminal).*
  - *Infrastructure (coastal roads, buildings, pipelines) may be stranded or become nonfunctional.*
  - *Wetland loss, desertification, dust storms near retreating coasts.*

Hint: *Focus on water balance: input vs. output in an endorheic basin.*

 # One of the favourite Maps of UPSC

STATIC CONNECT:

Aral Sea Shrinkage

- *Once world's 4th largest inland lake → located **b/w Kazakhstan & Uzbekistan***
- *Fed by Amu Darya & Syr Darya rivers*
- *1960s: Soviet irrigation projects (cotton, rice) → diversion of inflows*
- *Result: **90% shrinkage of surface area**, salinity ↑ drastically*
- *Ecological impacts → fisheries collapse, dust storms, health hazards*
- ***Aralkum Desert** formed on dried seabed*
- *Partial restoration in North Aral (Kazakhstan) via Kok-Aral Dam (2005)*
- *South Aral (Uzbekistan) → continues shrinking, near collapse*

32. Mount Dukono Erupts Again, Spewing Ash Over 1,000 m

Why in News?

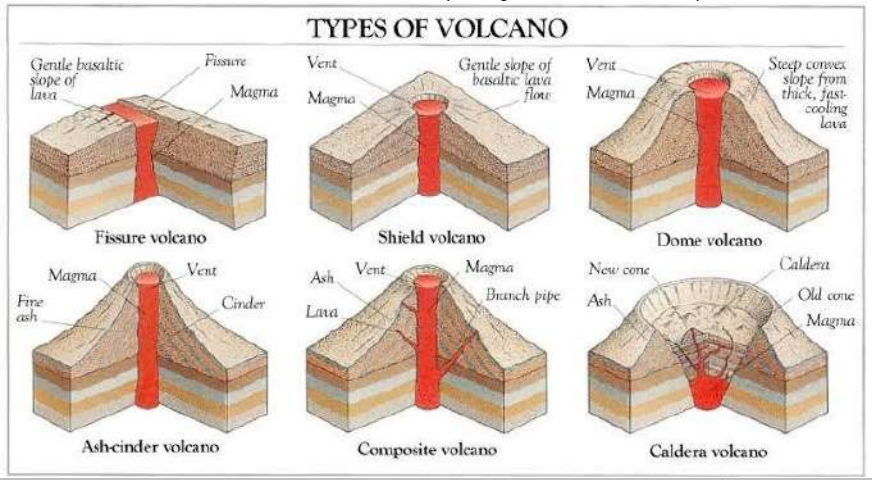
Because the active volcano Dukono in Indonesia has erupted recently, sending ash columns over 1 km high and triggering safety alerts.

Location & Volcano Profile

- *Dukono is on Halmahera Island, North Maluku province, Indonesia*
- *Elevation ~1,335 m above sea level*
- *It is a complex volcano with multiple craters*
- *It has been erupting continuously since 1933 (frequent ash emissions, minor explosions)*

Recent Activity & Alerts

- *In July 2025, ash column ~1,200 m above summit recorded; seismogram data: amplitude ~26 mm, duration ~78.71 s*
- *Earlier in July, ash reached ~1,100 m above summit; drifted eastwards*
- *Current alert status: Level II (Waspada / Moderate)*



CONCEPT CHECK:

Q. Which of the following volcanic features or remnants are correctly matched with their location in India?

1) Barren Island – Active volcano in Andaman Sea
2) Deccan Traps – Plateau basalts of Cretaceous-Paleogene period
3) Narcondam – Extinct volcanic island in Andaman Sea
4) Toba Caldera deposits – Found in Meghalaya plateau

Choose the correct answer:
(a) 1 and 2 only
(b) 1, 2 and 3 only
(c) 2 and 4 only
(d) 1, 2, 3 and 4

Hint: *Toba super-eruption ash reached India but not specifically Meghalaya as a caldera deposit.*

STATIC CONNECT:

Type of Volcano

Type of Volcano	*Shape & Structure*	*Magma Type*	*Lava Flow*	*Eruption Style*	*Example*
Shield Volcano	*Broad, dome-shaped, gentle slopes*	*Basaltic (low silica, low viscosity)*	*Fast, far-spreading*	*Effusive, non-violent*	*Mauna Loa (Hawaii)*
Composite/ Stratovolcano	*Steep, conical, layered (lava + ash)*	*Andesitic to rhyolitic (medium to high silica)*	*Moderately viscous*	*Explosive + Effusive (alternate)*	*Mount Fuji (Japan), Mount St. Helens (USA)*
Cinder Cone	*Small, steep, made of pyroclasts*	*Basaltic*	*Short-range*	*Explosive (low magnitude)*	*Parícutin (Mexico)*
Lava Dome/Volcanic Dome	*Dome-shaped, steep, viscous plug*	*Rhyolitic (very high silica)*	*Very slow, near vent*	*Violent, dome collapse → pyroclastic flows*	*Mount Pelée (Martinique)*
Caldera	*Large depression (collapse of emptied magma chamber)*	*Variable*	*Dependent on magma type*	*Catastrophic, super-eruptions*	*Yellowstone (USA), Toba (Indonesia)*
Submarine Volcano	*Underwater, mid-ocean ridges*	*Basaltic*	*Pillow lavas*	*Non-violent*	*Lo'ihi (Hawaii)*
Fissure Volcano	*Erupts along cracks/fissures, not central vent*	*Basaltic*	*Extensive flood basalts*	*Effusive*	*Deccan Traps (India), Iceland*

33. Earthquake in Delhi – Feb 17, 2025

Why in News?

Magnitude 4 quake near Dhaula Kuan, Delhi → strongest local event in 5 yrs

Earthquake Facts

- *Magnitude → 4.0 (Richter scale)*
- *Epicenter → Dhaula Kuan (Delhi)*
- *Depth → ~10 km (shallow focus → ↑ damage potential)*
- *Intensity → Mild tremors felt across Delhi NCR*
- *Casualties/Damage → None reported*

Seismicity of Delhi Region

- *Delhi lies in Seismic **Zone IV** (High Damage Risk) as per BIS zoning map*
- ***Zone classification (BIS)** → Zone II (Low), III (Moderate), IV (High), V (Very High)*
- *Delhi proximity → **Himalayan Frontal Fault system + Delhi-Haridwar Ridge + Moradabad Fault** → frequent minor quakes*
- *Past quakes → 1960s–2020s → multiple mild tremors; major concern = seismic vulnerability of high-population density*

CONCEPT CHECK:

Q. Assertion (A): Delhi lies in Seismic Zone IV, which is classified as a "high damage risk" zone.
Reason (R): Delhi is in proximity to active faults such as the Delhi–Haridwar Ridge and Moradabad fault, and also lies in the influence zone of the Himalayan tectonic stresses.
Which is correct?
(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, R is false
(d) A is false, R is true

34. 2024 Quality Report Unveils Widespread Chemical Pollutants in Ground Water

Why in News?

*Ministry of Jal Shakti released the Annual Ground Water Quality Report 2024, showing significant levels of **nitrate, fluoride, arsenic contamination** in parts of India.*

Key Highlights & Contaminants

- *Monitoring across 15,259 locations (with 4,982 trend stations)*

CONCEPT CHECK:

Q. Which of the following statements best explains why post-monsoon seasonal recharge leads to improvements in groundwater quality

- *19.8% of samples exceed nitrate safe limits (> 45 mg/L)*
- *9.04% samples have fluoride above BIS limit (1.5 mg/L)*
- *3.1% samples show arsenic above permissible limit*
- *Uranium exceedance in 6.6% of samples (> 0.03 mg/L)*
- *Cation-anion chemistry: Ca and HCO_3 dominate; water generally of Calcium-Bicarbonate type*

Spatial & Seasonal Patterns

- *In NE states (Arunachal, Mizoram, Meghalaya, J&K) 100% samples conform to BIS standards*
- *States with "hotspots" include Rajasthan, Haryana, Andhra Pradesh with contamination pockets*
- ***Salinity / high EC issues in Rajasthan**: ~48.6% samples > 3,000 µS/cm (notably Barmer, Jodhpur)*
- *Seasonal improvement post-monsoon (recharge dilutes contaminants) observed for EC & fluoride*

Health, Agricultural & Policy Implications

- ***Excess nitrate** → risk of methemoglobinemia, other health ailments*
- ***High fluoride** → dental & skeletal fluorosis*
- ***Arsenic & uranium** → carcinogenic, kidney & other chronic risks*
- *Irrigation suitability: > 81% of samples safe for use (assessed via SAR, RSC)*
- *But localized sodium / RSC issues → potential soil degradation in affected zones*

parameters such as Electrical Conductivity (EC) and fluoride concentration?
(a) Increased water table reduces microbial activity that produces ions
(b) Dilution effect and flushing of soluble salts from soils
(c) Enhanced evaporation removes excess ions leaving purer water
(d) Increased infiltration of rainwater reduces groundwater residence time

***Hint:** Think of how extra water can "wash out" dissolved ions.*

 # Will the RO filter in your home remove these pollutants?

35. Discovery of Potash Reserves in Punjab

Why in News?

Punjab government plans to explore potash mining in Fazilka & Sri Muktsar Sahib districts after surveys detected reserves.

Discovery & Geology

- *Reserves located in three blocks: Kabarwala (Muktsar Sahib), Sherewala & Ramsara, Shergarh & Dalmir Khera (Fazilka)*
- *Depth of mineralisation: ~ 400–800 m below surface*
- *Potash associated with halite, clay, dolomite in evaporite basin (Nagaur-Ganganagar Evaporite Basin extends into Punjab)*

Strategic Importance & Challenges

- *India currently imports **100%** of its potash — huge foreign exchange burden*
- *Domestic mining could provide fertilizer security (potassium source for NPK)*
- *Low concentration (~7–10 %) may make extraction economically unviable initially*
- *Depth of drilling & technical expertise pose major hurdles (India has no operational potash mines yet)*

Must Know Facts

- *Under the MMDR (Mines & Minerals [Development & Regulation]) Act, 2023, potash is classified among critical minerals*
- *Auction rights lie with Central government; states receive royalty & revenue share*

CONCEPT CHECK:

Q. Assertion (A): The auctioning rights over potash mineral resources in India lie with the Central Government under the MMDR Act, 2023.
Reason (R): Potash is classified as a critical mineral under the MMDR (Amendment) Act, 2023, thereby centralising its regulation.
Which of the following is correct?
(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

***Hint:** Consider how "critical minerals" are regulated under the changed MMDR Act.*

36. *Chhattisgarh becomes 1st state to link forest ecosystem services with Green GDP*

Why in News?

Chhattisgarh has adopted a pioneering initiative to formally integrate the value of its forest ecosystem services into the state's Green GDP.

Green GDP & Ecosystem Valuation: Conceptual Basis

- *Traditional GDP ignores environmental costs and ecosystem services.*
- ***Green GDP = GDP – (costs of environmental degradation & resource depletion) + (value of ecosystem services)***
- *Ecosystem services include carbon sequestration, water purification, soil fertility, biodiversity, etc.*

Chhattisgarh's Initiative: Key Features & Rationale

- *First Indian state to explicitly link forest ecosystem services with Green GDP*
- *~44 % of Chhattisgarh's land is under forest cover (≈ 59,820.78 sq km)*
- *Existing forest-management allocation ~ ₹3,000 crore; current "contribution to GDP via forests" ~ ₹1,000 crore (pending valuation)*
- *The plan aims to quantify hitherto intangible benefits (clean air, climate regulation, biodiversity etc) and fold into state planning & policies*

CONCEPT CHECK:

Q. Which of the following best illustrates the concept of "natural capital" as recognized in environmental economics?

(a) Stock of produced goods and services in an economy
(b) Human skills, education, and innovation contributing to productivity
(c) Forests, wetlands, biodiversity, and other ecosystems providing ecological services
(d) Investment in renewable energy and clean technologies

Hint: *Think of "capital" that is non-man-made but essential for sustaining economic activity.*

SCIENCE & TECHNOLOGY

37. Dedicated Nuclear Energy Mission announced in Budget 2025-26

Why in News?

*Union Finance Minister allocated **₹20,000 crore** for the mission, aiming to build **100 GW nuclear capacity by 2047**.*

Nuclear Energy Mission

Objective & Rationale

- *Target: 100 GW nuclear capacity by 2047.*
- *Address energy security, reduce carbon emissions, complement renewables.*
- *Current nuclear capacity: ~ 8,180 MW (≈ 8.18 GW) as of early 2025.*

Key Components & Strategies

- ***R&D for Small Modular Reactors (SMRs):** ₹ 20,000 crore to develop them; aim for ≥5 indigenous SMRs by 2033.*
- ***Bharat Small Reactors (BSRs):** 220 MW PHWR-class reactors to be developed for deployment near industries, less land requirement.*
- ***Legislative Reforms:** Amendments to Atomic Energy Act, Civil Liability for Nuclear Damage Act to allow private / foreign participation.*
- ***Public-Private Partnership (PPP):** Private entities may provide land, water, capital; NPCIL handles design, QA, O&M.*
- ***Fleet Mode Deployment:** Series of similar reactors (e.g. IPHWR-700) for scale & cost advantage.*
- ***Repurposing Coal Sites:** Use retired thermal plant sites for nuclear deployment to leverage existing infrastructure.*
- ***Global collaboration & sourcing:** Open tenders, foreign partnerships (e.g. for large reactors) while ensuring regulatory safeguards.*

CONCEPT CHECK:

Q. Consider the following statements:

1) India's three-stage nuclear power program aims at achieving long-term energy independence through thorium utilization.

2) Stage-II of the program involves Fast Breeder Reactors (FBRs) that use plutonium-based fuel.

Which of the above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

***Hint:** Remember the roadmap: PHWRs → FBRs → Thorium reactors.*

STATIC CONNECT:

Feature	***Small Modular Reactors (SMRs)***	***Bharat Small Reactors (BSRs)***
Definition	*Next-gen small reactors (≤300 MWe) → modular, factory-built, scalable*	*India's indigenous small reactor design (220 MWe PHWR-class)*
Global Context	*Being developed worldwide (e.g. NuScale-US, Rolls Royce-UK, Rosatom-Russia)*	*India-specific initiative under Nuclear Energy Mission*
Capacity	*≤300 MWe per unit*	*~220 MWe per unit*
Fuel Type	*Typically enriched uranium / advanced fuels (varies by design)*	*Natural uranium (PHWR lineage)*
Design Philosophy	*Modular → multiple reactors built in factory, assembled onsite*	*Compact PHWR design → deployable near industries, smaller sites*
Cooling System	*Many SMRs use advanced cooling → passive safety, water/air/salt*	*Uses heavy water moderation (continuity with India's PHWR expertise)*
Safety Features	*Passive safety, underground siting, modular shutdown*	*Based on proven PHWR tech → inherent safety features*
Deployment Sites	*Remote/off-grid areas, flexible siting (e.g. mining sites, islands)*	*Coal-retired plant sites, industrial hubs (synergy with infra)*
Cost & Time	*Lower upfront cost per unit; faster deployment (factory-built)*	*Cheaper indigenous variant; leverages domestic supply chain*
Global Examples	*NuScale (US), Akademik Lomonosov floating SMR (Russia), SMART (S. Korea)*	*Still in conceptual / development stage (India only)*
India's Status	*R&D supported with ₹20,000 crore (Budget 2025-26)*	*Announced in 2025 Nuclear Energy Mission for deployment by 2033*
Strategic Role	*Integrate with renewables, replace diesel/off-grid power, export potential*	*Bridge between existing PHWR fleet and futuristic SMRs; domestic deployment priority*

38. China's "artificial sun" sets fusion endurance record

Why in News?

China's EAST tokamak maintained stable plasma confinement for 1,066 seconds (≈ 17.8 minutes), breaking its own previous record.

Background: EAST & Fusion Context

- *EAST = Experimental Advanced Superconducting Tokamak in Hefei, China*
- *Started operations in 2006; used as testbed for superconducting-magnet tokamak technologies*
- *Key goals: maintain long-duration plasma, test non-inductive current drive, control instabilities, materials studies*
- *China is member of ITER consortium; EAST helps inform ITER/CFETR work*

The New Record & Technical Aspects

- *New confinement duration: 1,066 seconds (~17.8 min)*
- *Previous record by EAST: 403 seconds (2023)*
- *Achieved in "steady-state high-confinement plasma operation" mode (H-mode)*
- *Upgrades made: heating system power doubled (compared to earlier runs)*
- *Plasma temperatures in such tokamaks often exceed 100 million °C (to mimic conditions for fusion)*

CONCEPT CHECK:

Q. Which of the following correctly explains the term "energy trilemma" often used in policy discussions?
(a) Balancing nuclear, thermal, and renewable sources of power
(b) Managing trade-offs between energy security, energy equity, and environmental sustainability
(c) Deciding between fission, fusion, and fossil fuels for long-term use
(d) Resolving the conflict between national energy independence and global climate commitments

Hint: *Think about the three main competing priorities in energy policy.*

STATIC CONNECT:

Feature	***Nuclear Fusion***	***Nuclear Fission***
Definition	*Light nuclei (D, T) combine → heavier nucleus (He) + energy*	*Heavy nucleus (U-235, Pu-239) splits → lighter nuclei + energy*
Fuel Source	*Deuterium (abundant in seawater), Tritium (bred from Li)*	*Uranium, Plutonium (finite, mined ores)*
Reaction Condition	*Requires extremely high T (~100–150 mn °C) & plasma confinement (tokamak, lasers)*	*Can occur at room T once chain reaction initiated*
Energy Release	*Much higher (1 g D-T fuel ≈ 8 tons oil)*	*Lower compared to fusion (but still millions × chemical)*
By-products	*Helium (non-toxic) + neutrons*	*Fission fragments (radioactive, long half-lives)*
Waste Disposal	*Minimal, short-lived*	*Significant radioactive waste, long-term storage needed*
Safety	*Inherently safe → loss of control = plasma extinguishes*	*Risk of meltdown (Chernobyl, Fukushima) & nuclear proliferation*
Status	*Still experimental → ITER, EAST, NIF, SST-1 etc.*	*Commercially established (400+ reactors globally)*
Examples	*Sun & stars (natural fusion)*	*Nuclear power plants, atomic bombs (Hiroshima, Nagasaki)*
India Context	*ADITYA-U, SST-1, ITER contributions*	*23 operational nuclear reactors (NPCIL), mainly PHWRs*

39. India Achieves In-Space Docking with SpaDeX Mission

Why in News?

ISRO successfully docked two satellites in orbit (SpaDeX), making India the 4th country to do so.

SpaDeX Mission — Key Facts & Significance

Mission Overview

- *SpaDeX = Space Docking Experiment*

CONCEPT CHECK:

Q. India joined the league of nations capable of in-space docking after SpaDeX's success. Which of the following strategic capabilities becomes more

- *Launched on 30 December 2024 aboard PSLV-C60 from Satish Dhawan Space Centre*
- *Two satellites (each ~ 220 kg) — designated Chaser (SDX01) and Target (SDX02)*
- *Orbit altitude ~ 460 km, inclination ~ 45°*

Objectives & Technologies Demonstrated

- *Autonomous rendezvous & docking in orbit*
- *Electrical power transfer between docked satellites*
- *Composite spacecraft control (treating docked pair as single entity)*
- *Undocking & independent operation of satellites post-docking*

Milestones & Timeline

- *Docking succeeded on 16 January 2025 (after earlier postponements)*
- *India joined USA, Russia, China as 4th country to achieve in-space docking*
- *Post-docking, satellites operated as a stacked object under control*
- *Undocking planned; further experiments (power transfer, redocking) in extended phase*

Strategic & Future Relevance

- *Key capability for satellite servicing, on-orbit assembly, space stations, interplanetary missions*
- *Supports ISRO's goal of Bharatiya Antariksha Station by 2035 & crewed missions (Gaganyaan etc.)*
- *Demonstrates India's maturation in space technology & enhances its position in global space sector*

CONCEPT CHECK:

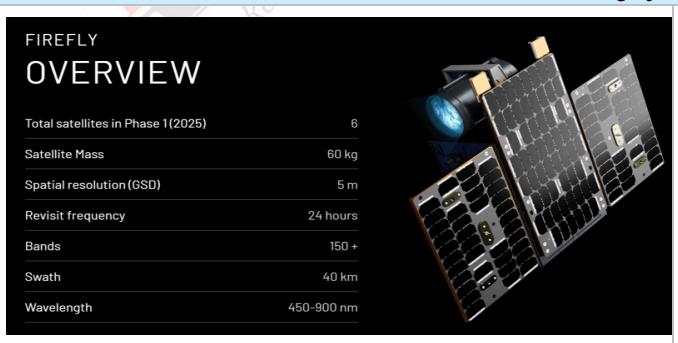
Q. The advantage of hyperspectral imaging over multispectral imaging in satellite remote sensing is largely due to:
(a) Higher revisit frequency of satellites
(b) Ability to capture narrow contiguous spectral bands enabling material identification
(c) Larger swath width of ground coverage
(d) Lower cost per sensor channel

Hint: *Think spectral resolution and discrimination.*

40. India's First Private Satellite Constellation 'Firefly' Launched

Why in News?

Bengaluru-based space startup Pixxel has successfully launched the first three satellites of "Firefly", India's first private (commercial) Earth-imaging constellation.



Pixxel's Firefly Constellation

Overview & Significance

- *Firefly = India's first private/commercial satellite constellation (Earth imaging)*
- *Built by Pixxel (founded 2019 by Awais Ahmed & Kshitij Khandelwal)*
- *Demonstrates increasing role of private sector in India's space/EO domain*

Launch & Orbit Details

- *Three Firefly satellites launched Jan 2025 via SpaceX's Transporter-12 mission from Vandenberg, USA*
- *Orbit: Sun-synchronous, ~550 km altitude*
- *More satellites (to total six) planned for Q2 2025 for full phase-one deployment*

Technical Capabilities & Advantages

- *Hyperspectral imaging at ~5-metre spatial resolution (first time in hyperspectral commercial constellation)*
- *Captures data across 135+ to 150+ spectral bands (wide spectral range)*
- *Swath width: ~40 km (i.e. width of ground area imaged)*
- *More precise / finer detail imaging vs conventional hyperspectral norms (e.g. 30 m standard)*
- *Onboard propulsion for station-keeping (longer life) & improved revisit frequency*

Applications & Use Cases

- *Agriculture monitoring (crop health, nutrient stress)*
- *Environmental & climate monitoring (deforestation, pollution, water quality)*
- *Resource sectors: mining, oil & gas, infrastructure monitoring*
- *Defense / strategic mapping (detection of subtle changes)*

Feature	***Hyperspectral Imaging (HSI)***	***Multispectral Imaging (MSI)***
Definition	*Captures hundreds of narrow bands (contiguous spectrum)*	*Captures few wide bands (non-contiguous spectrum)*
Spectral Resolution	*Very high (narrow bands: 5–10 nm)*	*Moderate/low (bands: 50–200 nm)*
No. of Bands	*100–400+ bands*	*3–10 bands typically*
Spectral Coverage	*Continuous across VNIR, SWIR, sometimes TIR*	*Selective bands across visible, NIR, SWIR*
Data Volume	*Very large (big storage & processing needs)*	*Smaller, easy to process*
Material Identification	*Can detect subtle differences → minerals, crops, vegetation stress*	*General classification → land cover, vegetation index*
Applications	*Mineral exploration, precision agriculture, water quality, defense surveillance*	*Vegetation monitoring (NDVI), land use mapping, disaster management*
Examples	*PRISMA (Italy), EnMAP (Germany), Hyperion (NASA), ISRO's upcoming HysIS*	*Landsat, Sentinel-2, Resourcesat, IRS series*
Advantage	*Detailed "spectral fingerprint" of materials → high accuracy*	*Wider swath, faster processing, lower cost*
Limitation	*Heavy data → costly, complex analysis, smaller swath*	*Limited ability to distinguish similar materials*
Current Status / Updates	*ISRO developing HysIS-II; NASA working on Surface Biology & Geology (SBG) mission*	*Sentinel-2 & Landsat-9 operational with multispectral capabilities*

41. Mission SCOT: India's first commercial space surveillance satellite succeeds

Why in News?

PM Modi praised ***Digantara*** *for launching Mission SCOT, the world's first commercial Space Situational Awareness (SSA) satellite.*

Mission SCOT & Digantara

- *SCOT = Space Camera for Object Tracking — India's first dedicated SSA satellite*
- *Launched on 14 January 2025 aboard SpaceX's Transporter-12 rideshare mission*
- *Operates in sun-synchronous orbit — ideal for frequent, consistent monitoring of Low Earth Orbit (LEO)*
- *Capability: tracks Resident Space Objects (RSOs) as small as 5 cm in size*
- *Backed by Aditya Birla Ventures and SIDBI*
- *Founded in Bengaluru (2018) by Anirudh Sharma, Rahul Rawat, Tanveer Ahmed*

CONCEPT CHECK:

Q. Assertion (A): The deployment of Mission SCOT reduces India's dependence on international SSA data sources.
Reason (R): SCOT's sun-synchronous orbit ensures uniform revisit over all orbital inclinations, making it globally comprehensive.

Which is correct?
(a) A and R are true, and R explains A

- *Digantara also expanded operations to Colorado, USA — investing ~$10–15 million in spacecraft manufacturing / optics facility*
- *Targets $25–30 million in revenue over next two years via U.S. contracts & global SSA market*

Strategic Importance & Context

Global & National SSA Context

- *SSA = tracking, cataloguing, characterising space objects & debris — critical for collision avoidance, orbital safety*
- *India's **"NETRA / SST"** network and ISRO's radar + optical systems exist, but have limitations (range, weather, revisit rate)*
- *SCOT adds commercial / private sector capability in SSA, complementing state capacity*
- *Space increasingly congested — collision risk rising; small debris (5 cm) can damage satellites*

(b) A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Hint: *Think whether SCOT's orbit property by itself gives comprehensive coverage, and whether that supports independence.*

Space Situational Awareness (SSA) & Space Debris

- ***SSA →*** *ability to detect, track, predict movement of space objects (satellites, debris, asteroids)*
- ***Space debris →*** *36,500+ pieces (>10 cm), 1 million (1–10 cm), 130M (>1 mm), risk to satellites/ISS*
- ***Kessler Syndrome →*** *chain reaction of collisions → exponential debris growth → makes orbits unusable*

Indian Capabilities

- ***NETRA Project (ISRO, 2019) →*** *indigen. SSA network; track space objects >10 cm up to 3,000 km altitude*
- ***Multi-Object Tracking Radar (MOTR) →*** *Sriharikota, tracks 10 objects simultaneously, range ~1,000 km*
- ***Space Debris Tracking Radars & Telescopes →*** *monitoring in LEO/GEO, coordination with global SSA networks*
- *India → member of **Inter-Agency Space Debris Coordination Committee (IADC)***

42. NASA's SPHEREx Mission Launches to Map Cosmic History

Why in News?

NASA launched SPHEREx in March 2025 to study cosmic evolution and life-forming molecules.

SPHEREx: Mission Overview

- ***Full form:*** *Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer*
- ***Type:*** *NASA medium-class astrophysics mission (MIDEX/Explorer class)*
- ***Objective:*** *Carry out an all-sky spectral survey (0.75 – 5.0 μm) to probe galaxy formation, cosmic inflation, and origins of interstellar ices (H_2O, CO_2 etc.).*
- ***Instrument:*** *A single spectrophotometer using linear variable filters (no moving parts)*
- ***Survey coverage:*** *Each 6.2"×6.2" pixel in ~102 spectral channels across full sky*

Launch & Orbit Details

- ***Launch date:*** *12 March 2025 (UTC) aboard SpaceX Falcon 9*
- ***Launch site:*** *Vandenberg Space Force Base, SLC-4E*
- ***Orbit:*** *Sun-synchronous, low Earth orbit at ~650 km altitude, ~97° inclination, ~90 min orbital period*

Scientific Goals & Techniques

- ***Map redshifts & spectral energy distributions*** *for ~450 million galaxies & >100 million Milky Way stars*
- ***Probe cosmic inflation*** *by statistical correlation in large-scale structure (esp. low redshift regime)*
- ***Detect and map ices and volatile molecules*** *(H_2O, CO_2 etc.) in molecular clouds / dust clouds in our galaxy via absorption features*
- ***Perform 4 full-sky surveys over*** *~25 months (nominal mission)*

CONCEPT CHECK:

Q. Which of the following pairs of missions and their objectives are correctly matched?

1) *JWST (James Webb Space Telescope) – Study first stars and galaxies in infrared spectrum*
2) *Gaia (ESA) – Precise astrometric mapping of stars in the Milky Way*
3) *TESS (NASA) – Detection of Earth-like exoplanets through transit method*
4) *SPHEREx (NASA) – Search for gravitational waves from merging black holes*

Select the correct answer:
(a) 1, 2 and 3 only
(b) 1 and 2 only
(c) 2, 3 and 4 only
(d) 1, 2, 3 and 4

Hint: *Only one mission here is mismatched in objective.*

- *Use optimized survey planning software to mitigate LEO pointing constraints, South Atlantic Anomaly, downlink scheduling etc.*

43. Discovery of Semi-Dirac fermion in ZrSiS

Why in News?

For the first time, scientists have observed a quasiparticle that is massless in one direction but massive in the perpendicular direction, in the material ZrSiS.

Key Concepts & Background

- ***Quasiparticle:*** *emergent particle-like excitations in solids, arising from collective behavior of electrons.*
- ***Dirac fermion:*** *in materials, electrons behave as massless particles with linear energy–momentum relation in all directions.*
- ***Semi-Dirac fermion*** *(predicted ~2008–09): hybrid type — linear dispersion (massless) along one direction, quadratic dispersion (massive) along the orthogonal direction.*
- ***ZrSiS (zirconium silicon sulfide):*** *layered Dirac semimetal, structure allows exotic electronic behavior.*

Discovery Details & Evidence

- *Experimenters used magneto-infrared (magneto-optical) spectroscopy under strong magnetic fields, at cryogenic temperatures, on ZrSiS crystals.*
- *They observed Landau level transitions whose energy scaling with magnetic field B followed a $B^{2/3}$ power law — a hallmark predicted for semi-Dirac fermions.*
- *The semi-Dirac fermions were found at special crossings of nodal lines in the band structure of ZrSiS.*
- *Published in Physical Review X (2024) under title "Semi-Dirac Fermions in a Topological Metal".*

CONCEPT CHECK:

Q. The recently discovered Semi-Dirac fermion in ZrSiS differs from conventional Dirac fermions primarily because:

(a) It is a fundamental particle of the Standard Model with partial mass.

(b) It exhibits linear dispersion along one crystallographic axis and quadratic dispersion along the orthogonal axis.

(c) It is identical to Weyl fermions but exists only at cryogenic temperatures.

(d) It represents the first experimental evidence of Majorana-like excitations in semiconductors.

Hint: *Think of "massless in one direction, massive in another."*

Standard Model vs Condensed Matter Physics contexts

Standard Model of Particle Physics (High-Energy Physics)

- ***Scope*** *→ Fundamental particles of nature (quarks, leptons, bosons, Higgs).*
- ***Dirac Fermions*** *(fundamental) → e.g., electrons, neutrinos (massless in original Dirac equation, but electrons have mass due to Higgs).*
- ***Weyl Fermions*** *→ Chiral, massless solutions of Dirac eqn (not yet observed as fundamental in SM).*
- ***Majorana Fermions*** *→ Hypothetical neutral fermions = own antiparticle (possible for neutrinos).*
- ***SM Fermions*** *→ Inherent properties, universal across space-time.*

Condensed Matter Quasiparticle Models (Low-Energy Effective Theories)

- ***Scope*** *→ Emergent excitations in solids due to collective electron behavior.*
- ***Dirac Fermions in Solids*** *→ Electrons mimic relativistic massless fermions → linear E–k dispersion (e.g. graphene).*
- ***Weyl Fermions in Solids*** *→ Observed in Weyl semimetals (2015) → analogues of high-energy Weyl particles.*
- ***Majorana Quasiparticles*** *→ Emergent excitations in superconductors → analogues of Majorana fermions.*
- ***Semi-Dirac Fermions (new discovery)*** *→ Hybrid quasiparticles:*
  - *Massless in one direction (Dirac-like)*
  - *Massive in perpendicular direction (Schrödinger-like)*
  - *Observed in ZrSiS (2024, PRX)*

Mapping the Discovery

- ***NOT a new SM particle*** *→ Semi-Dirac fermions are emergent quasiparticles in solids, not fundamental entities.*
- ***Analogy*** *→ Uses mathematical framework of Dirac equation solutions, but applied to crystal band structure.*
- ***Significance*** *→ Enriches the "particle zoo" of condensed matter → beyond graphene's Dirac fermions → adds direction-dependent mass physics.*

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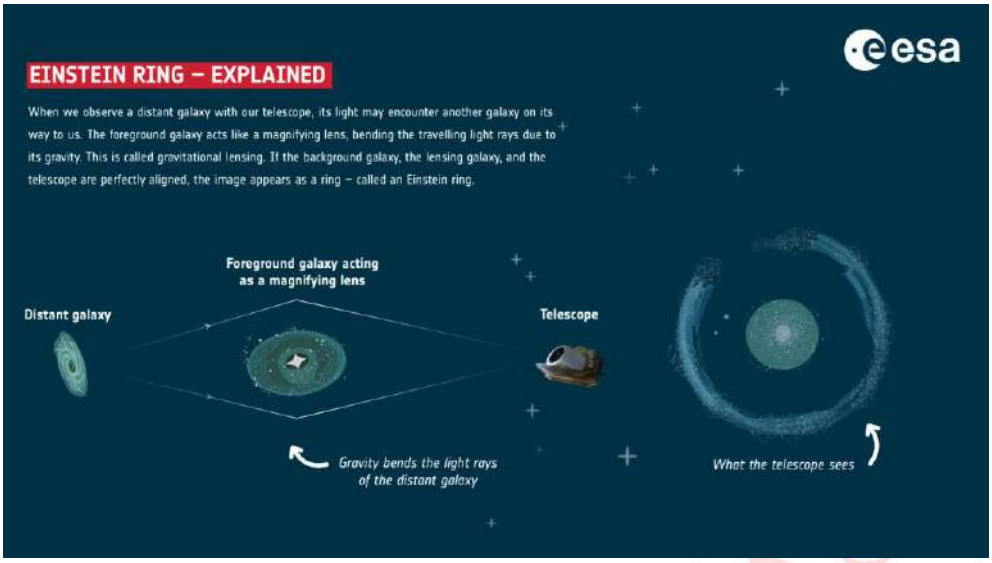
In short: *Semi-Dirac fermions are not part of the Standard Model, but an emergent quasiparticle model in condensed matter physics, mathematically inspired by Dirac fermions in high-energy physics.*

44. Rare Einstein ring spotted around galaxy NGC 6505 by Euclid telescope

Why in News?

*The **ESA's Euclid mission** has discovered a complete Einstein ring around the galaxy NGC 6505, a phenomenon rarely observed.*



Einstein Ring & Gravitational Lensing

- *An Einstein ring occurs when a distant light source, a massive "lens" galaxy, and the observer are nearly perfectly aligned, bending light into a ring.*
- *It is a form of strong gravitational lensing, useful to probe mass distribution (including dark matter) and cosmology.*

The Discovery: NGC 6505 Case

- ***Lens galaxy:*** *NGC 6505, at redshift $z \approx 0.042$ (≈ 590 million light-years away).*
- ***Background (source) galaxy:*** *behind NGC 6505, light bent to form ring; redshift $z \approx 0.406$ (≈ 4.42 billion light-years).*
- *The measured Einstein radius is **~ 2.5 arcseconds** (≈ 2.1 kpc at the lens redshift).*
- *Within that radius, the dark matter fraction is estimated ~ 11.1 % (± uncertainties).*
- *The stellar initial mass function (IMF) in the central region is "heavier" than the Chabrier IMF (i.e. more low-mass stars) — mismatch parameter $\alpha_{IMF} \approx 1.26$.*
- *NGC 6505 has been known since 1884, but the Einstein ring was not observed until now.*

Significance & Implications

- *This is the first strong lens in an NGC galaxy discovered and the first in Euclid's early data.*
- *Euclid is expected to find ~ 100,000 strong lens systems over its 6-year mission.*
- *In its first Quick Data Release (Q1), Euclid has already identified ~ 500 high-quality strong lens candidates, showing that the mission's goal is feasible.*

CONCEPT CHECK:

Q. The Euclid mission's discovery of a complete Einstein ring around NGC 6505 is especially valuable because it allows precise measurement of:
(a) the Hubble constant using time delays
(b) the stellar initial mass function and dark matter fraction in the lensing galaxy
(c) neutrino masses via weak lensing distortions
(d) the cosmic microwave background anisotropy at small scales

Hint: *It's a lensing system close enough to resolve internal structure of the lens galaxy.*

 # How Einstein predicted this?

- *The discovery allows precise tests of general relativity on galactic scales, insights into mass distribution (stellar + dark), and studies of galaxies that otherwise would be too faint to observe.*

45. "Rule-Breaking" Black Hole LID-568 Challenges Theoretical Limits

Why in News?

Astronomers have discovered a supermassive black hole, LID-568, that appears to accrete matter at ~40× the Eddington limit, defying prevailing growth models.

LID-568 & Implications for Black Hole Physics

Discovery & Observations

- *Located ~**1.5 billion years** after the Big Bang (z ~ 3.965)*
- *Initially spotted via intense X-ray emission in the **Chandra COSMOS legacy survey***
- *Followed up using **JWST** (NIRSpec integral field spectroscopy) to pinpoint its position and spectrum*
- *Detected large outflows of gas (velocity ~ –500 to –600 km/s) indicative of active feedback*

Key Properties & Anomalies

- *Black hole mass estimated ~**7.2 million M⊙ (solar masses)** in initial analyses*
- *Apparent accretion rate ~**40× the theoretical Eddington limit** (i.e., super-Eddington accretion)*
- *Suggested that much of its mass growth may have occurred in a single rapid accretion episode*
- *Such behavior (super-Eddington bursts) was theorized but rarely observed so cleanly before*

Theoretical & Cosmological Implications

- *Challenges standard black hole growth models, which assume Eddington-limited accretion over long timescales*
- *Supports scenarios where rapid super-Eddington episodes help build large SMBHs early in cosmic history*
- *Provides observational backing to "seed" models (light seeds from Pop III stars or heavy seeds from direct collapse) by enabling fast catch-up growth*

CONCEPT CHECK:

Q. Which of the following best explains why the discovery of LID-568 challenges "standard black hole growth models"?

(a) It shows that black holes cannot accrete at Eddington-limited rates.

(b) It demonstrates that black hole seeds must always be "heavy seeds."

(c) It provides evidence that rapid episodic super-Eddington bursts could play a dominant role in early SMBH growth.

(d) It invalidates the concept of radiative efficiency in accretion disks altogether.

***Hint:** Think about how one can "catch up" growth in a relatively short cosmological time.*

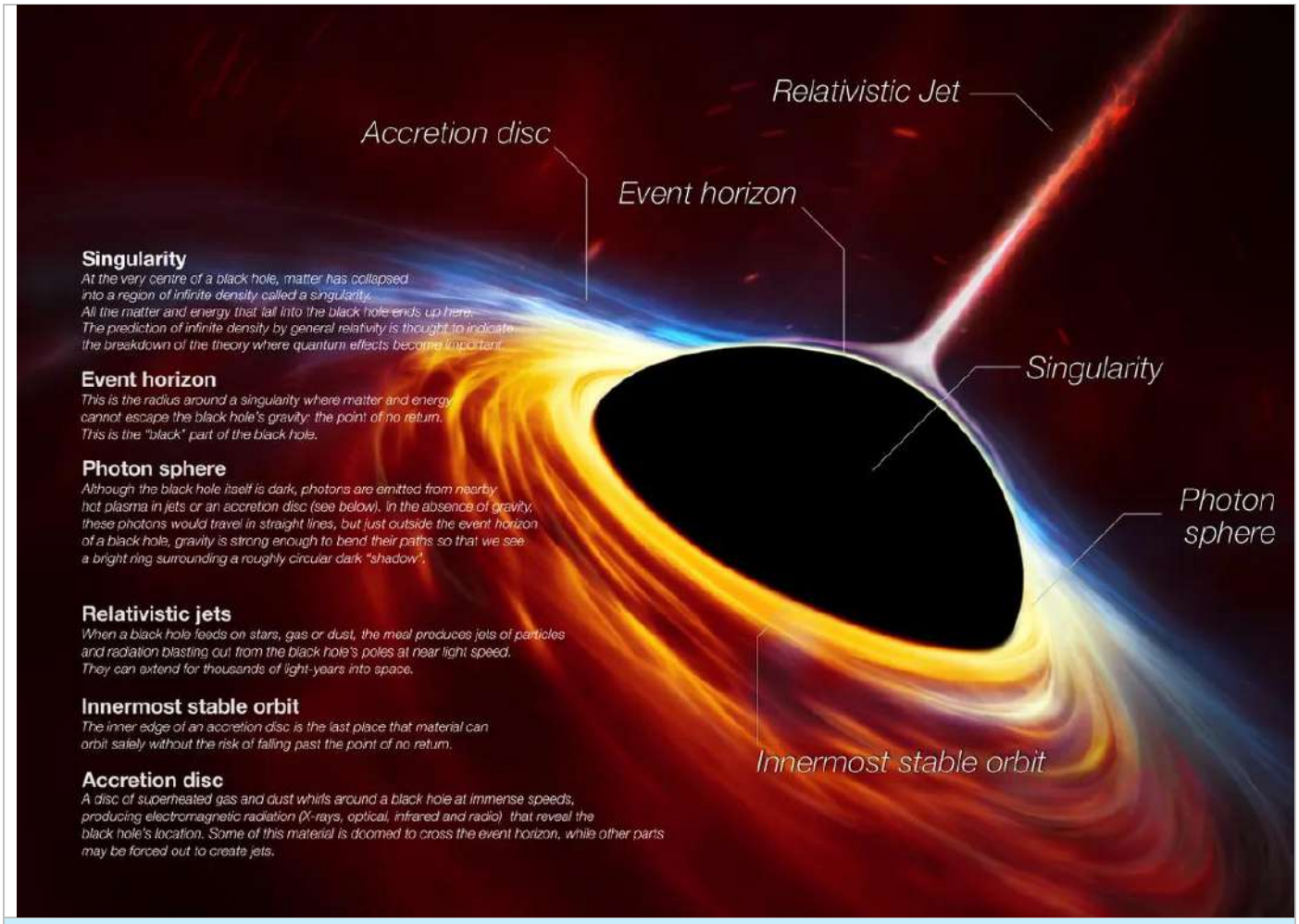
STATIC CONNECT:

Black Holes – Basics

- *Region in spacetime → gravity so strong that not even light can escape.*
- *Defined by **event horizon** (boundary beyond which nothing returns).*
- *Types → **Stellar-mass BHs** (few M⊙), **Intermediate-mass** (10^2–10^5 M⊙), **Supermassive** (10^6–10^{10} M⊙).*
- *Detected indirectly → X-ray emission, gravitational lensing, orbital motion of stars.*

Eddington Limit & Accretion Physics

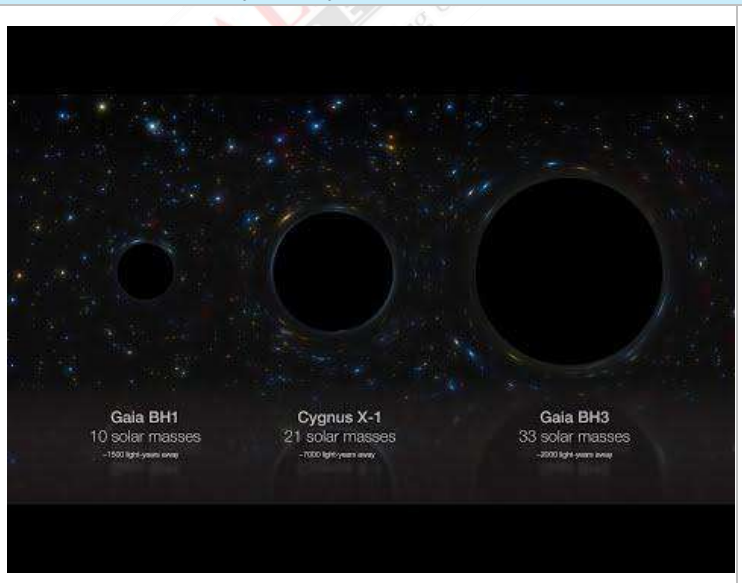
- ***Accretion disk** → gas + dust spirals inward, heats up, emits EM radiation.*
- ***Eddington limit** = max luminosity when radiation pressure = gravitational pull.*
- ***Super-Eddington accretion** → episodic bursts where inflow > radiation pressure.*



46. *Gaia BH3 — New Milky Way Stellar Black Hole Discovery*

Why in News?

Astronomers have discovered Gaia BH3, the largest known stellar-mass black hole in the Milky Way.



Gaia BH3 Discovery & Identification

- *Identified via wobble in companion star's motion using Gaia astrometry.*
- *Announced 16 April 2024 in Astronomy & Astrophysics.*
- *It is a **dormant black hole** (i.e., not actively accreting or emitting strongly)*

Physical Properties & Orbit

- *Mass ≈ **33 × solar mass** (makes it the heaviest stellar black hole yet found in our galaxy)*
- *Distance from Earth ~**1,900–1,926 light-years** (≈ 590 parsecs)*
- *Orbit period with companion star ≈ 11.6 years*

CONCEPT CHECK:

Q. Gaia BH3 was discovered via astrometric wobble in its companion star's motion. Which of the following best describes this detection method?

(a) Observing periodic Doppler shifts in the companion's spectral lines

(b) Measuring periodic shifts in the companion's proper motion / position on the sky

(c) Detecting X-ray emission as matter accretes onto the black hole

(d) Observing gravitational wave signature from merger with companion

Hint: *Astrometry is the science of precise positions and motions on the sky.*

- *Orbital separation varies (eccentric orbit) — periastron to apastron distances are comparable to tens of astronomical units (AU)*
- *Companion star is a metal-poor giant (G spectral type)*

Significance & Implications

- *Bridges gap between "local" stellar black holes and those detected via gravitational waves (which often involve higher masses)*
- *Challenges models of how massive stars collapse and black holes form, especially in low metallicity environments (metal-poor progenitors)*
- *Its motion is retrograde relative to Milky Way's disk stars, suggesting it may have originated in a now-disrupted stellar system or halo stream (ED-2)*
- *The system is being considered to have formed dynamically (e.g. in a globular cluster progenitor) rather than in a simple isolated binary path.*

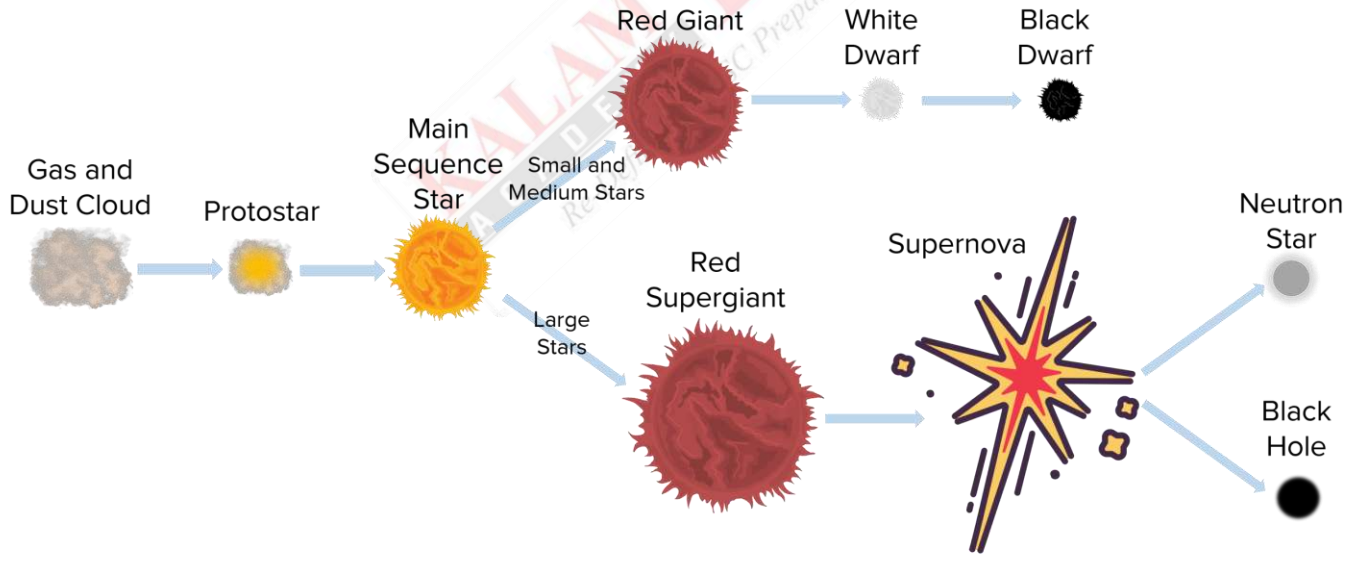
 # What will happen to our Sun during end of life?

Stellar Evolution (Life Cycle of Stars)

- ***Nebula** → cloud of gas & dust → star formation by gravity*
- ***Protostar** → contraction ↑ temp → nuclear fusion begins*
- *Main Sequence Star → H → He fusion (stable phase, Sun is here)*
- ***Red Giant / Supergiant** → H exhausted → outer layers expand → He & heavier elements fuse*
- *Fate depends on mass:*
  - *Low/Medium mass (like Sun): → Planetary Nebula → **White Dwarf***
  - *High mass (>8 solar mass): → Supernova → leaves **Neutron Star / Black Hole***

Chandrasekhar Limit

- *Defn → Max mass of stable White Dwarf (supported by electron degeneracy pressure)*
- *Value → ≈ **1.4 Solar Mass***
- ***Above limit** → White Dwarf collapses → Neutron Star / Black Hole*
- *Discovered by → **Subrahmanyan Chandrasekhar** (1930)*



47. *Deep-sea observatory in Mediterranean captures record-breaking neutrino*

Why in News?

A neutrino with unprecedented energy was detected beneath the Mediterranean by the KM3NeT telescope.

KM3NeT & Detector Setup

- *KM3NeT = Cubic Kilometre Neutrino Telescope, under construction in Mediterranean Sea (Italy + France).*

CONCEPT CHECK:

Q. Which of the following discoveries/phenomena is directly connected with the concept of neutrino oscillation?

(a) Resolution of the Solar Neutrino Problem

- *Uses arrays of optical modules (photomultipliers inside glass spheres) to detect Cherenkov light from charged particles produced when neutrinos interact in/near water.*
- *Builds on legacy of earlier Mediterranean neutrino detectors (e.g. ANTARES)*

The Detected Neutrino (Event: KM3-230213A)

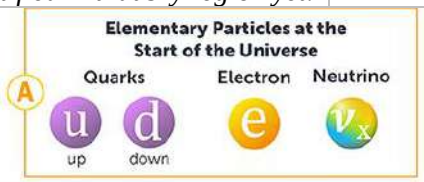
- *Detected on 13 February 2023 by ARCA, but results published in 2025.*
- ***Reconstructed muon track** traversed ~87 miles (~140 km) of rock + water before entering detector — indicating a neutrino origin.*
- ***Measured muon energy** ~ 120 PeV; inferred neutrino energy ~ 220 PeV (± uncertainties)*
- *Energy ~ 30× higher than the previous neutrino energy record.*
- *Direction nearly horizontal (0.6° above horizon) — **supports cosmic origin** rather than atmospheric background.*
- ***No clear counterpart** (e.g. gamma-ray flare) identified in that sky region yet.*

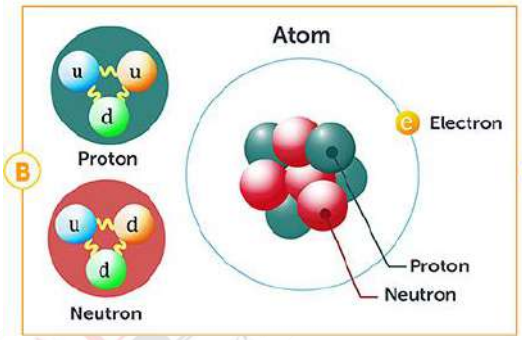
(b) Confirmation of the Higgs boson at CERN
(c) Evidence of gravitational waves from binary black holes
(d) Detection of dark matter particles in underground labs

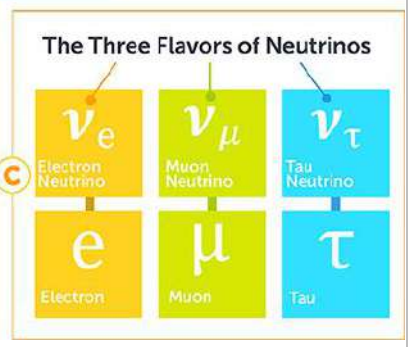
***Hint:** It showed that neutrinos have tiny but non-zero mass.*

Neutrinos – Basics

- *Subatomic particles (leptons) → electrically neutral, nearly massless, weakly interacting*
- *3 known flavours → **electron** (νe), **muon** (νμ), **tau** (ντ)*
- *Associated with corresponding charged lepton (e^-, μ^-, τ^-)*
- *Travel close to speed of light → rarely interact with matter → "ghost particles"*







Production Sources

- ***Natural:** Nuclear fusion in Sun (≈10^{11} neutrinos/cm^2/sec at Earth), supernovae, cosmic rays interacting with atmosphere*
- ***Artificial:** Nuclear reactors, particle accelerators, radioactive decay*

Detection Methods

- *Cannot be detected directly → observed via secondary charged particles created in interactions*
- *Detection media: water, ice, liquid scintillators*
- *Signature: **Cherenkov radiation** (blue light in medium when particle speed > light speed in that medium)*
- ***Major detectors:***
  - *IceCube (South Pole, ice)*
  - *KM3NeT (Mediterranean Sea, water)*
  - *Super-Kamiokande (Japan, water Cherenkov)*
  - *Sudbury Neutrino Observatory (Canada, heavy water)*

Neutrino Oscillation

- *Phenomenon: **Flavour conversion** (νe ↔ νμ ↔ ντ) during propagation*
- *Implies neutrinos have tiny but non-zero mass*
- *Discovery (**Super-Kamiokande, Sudbury**) → 2015 Nobel Prize in Physics*
- *Crucial for explaining solar neutrino problem*

India & Neutrinos

- *India-based Neutrino Observatory (INO) planned in Tamil Nadu (Theni district, Bodi Hills)*
- *Project: 50 kton Iron Calorimeter (ICAL) detector, underground cavern (~1.3 km)*
- *Aim: Study neutrino oscillations, mass hierarchy*
- *Faced delays due to environmental & political clearances (last update: MoEFCC clearance withdrawn, case in SC)*

48. Microsoft unveils "Majorana 1" — quantum chip powered by Topological Core

Why in News?

Microsoft announced Majorana 1, claiming it as the first quantum chip using a new topological architecture to jump-start scalable, stable qubits.

Majorana 1 Quantum Chip

Overview & Claims

- *Named after **Majorana fermions** (particles = own antiparticles)*
- *Developed by Microsoft, using a new class of material **"topoconductor"** (InAs-Al hybrid)*
- *The chip is designed around a **Topological Core architecture**, aiming for greater robustness / error suppression*
- *Microsoft suggests the chip enables a path to scaling to ~**1 million qubits** on a palm-sized device.*
- *Currently, it hosts **8 qubits** (or is capable of 8 qubits) as a test / research device.*

Technical & Scientific Challenges

- ***No definitive proof yet** that the chip harbors **true Majorana zero modes** (vs trivial modes) — community is skeptical*
- *Some studies argue the **testing protocols** (e.g. topological gap protocol) used by Microsoft are ambiguous or inconsistent.*
- *Critics point out the demonstration so far is for readouts, **not for full quantum operations** or coherence of qubits.*
- *Microsoft's earlier quantum claims had faced controversy and retractions, which make the scientific community cautious.*

Significance & Potential

- *If valid, topological qubits promise intrinsic error protection / fault tolerance, reducing overhead in error correction.*
- *Could accelerate the arrival of useful quantum computers from "decades" to "years" (Microsoft's claim)*
- *Applications envisioned: advanced materials, chemical simulations, cryptography, solving complex industrial & scientific problems.*

CONCEPT CHECK:

Q. Which of the following best explains why topological qubits (such as those based on Majorana zero modes) are considered attractive for quantum computing?

(a) They can operate at room temperature, avoiding need for dilution refrigerators

(b) They permit encoding of qubit information in non-local degrees of freedom, making them intrinsically more robust to local noise

(c) They allow instantaneous communication between qubits over large distances

(d) They eliminate all need for error correction, regardless of scale

***Hint:** Think of how topology gives protection against local perturbations rather than needing active correction.*

STATIC CONNECT:

Basics of Quantum Computing

- ***Qubits** → Basic unit of quantum info (analogous to bits) → can be in state |0⟩, |1⟩, or combo.*
- ***Superposition** → Qubits can exist in multiple states simultaneously → ↑ computational parallelism.*
- ***Entanglement** → Correlation between qubits → state of one instantly affects other → enables quantum teleportation, error correction, secure comm.*

- ***Advantage*** → *Exponential speed-up vs classical (e.g., Shor's algorithm for factorization, Grover's for search).*

Quantum Particles: Majorana Fermions

- ***Definition*** → *Hypothetical particle = its own antiparticle.*
- *Predicted by* → ***Ettore Majorana*** *(1937).*
- ***Properties*** → *Neutral, stable, non-Abelian statistics* → *candidate for topological qubits (fault-tolerant QC).*
- ***Detection*** → *Quasi-particles in superconductors mimic Majorana behavior (e.g., nanowires, quantum Hall systems).*
- ***Relevance*** → *Potential dark matter candidate; application in quantum error-resistant computing.*

49. Unique human-specific NOVA1 variant may underlie speech evolution

Why in News?

CRISPR-edited mice carrying a human-only I197V change in the NOVA1 protein show altered vocalization and RNA splicing in vocal circuitry, implicating this variant in spoken language evolution.

NOVA1 & Its Biological Role

- *NOVA1 encodes a* ***neuron-specific RNA-binding protein*** *(member of the NOVA family) involved in alternative splicing in the nervous system.*
- *It is recognized as a* ***paraneoplastic antigen*** *(in some cancers), but its physiological role is in neural RNA regulation.*

The I197V Variant: Human Specific & Evolutionary Sweep

- *In modern humans,* ***position 197 is valine (V)****, replacing* ***ancestral isoleucine (I)*** *present in* ***Neanderthals****,* ***Denisovans****, and* ***non-human mammals****.*
- *In a survey of ~ 650,000 human genomes, all but six individuals carried the* ***V variant****, pointing to near fixation.*
- *The low allele frequency of alternate forms, and* ***negative Tajima's D*** *signatures for NOVA1, suggest a strong selective sweep in ancestral modern humans.*

Functional Evidence from "Humanized" Mice

- *Researchers created Nova1 hu/hu mice by CRISPR knock-in of the human I197V variant.*
- *The I197V substitution does not grossly impair NOVA1's RNA binding properties or general neural development.*
- *But it induces specific alternative splicing changes in transcripts implicated in vocalization circuits.*
- *Behaviorally, pups and adult mice with the human variant show* ***altered ultrasonic vocal sequences (e.g. "syllable" pattern shifts)*** *and more complex high-frequency calls in courtship contexts.*
- *The variant's effects are subtle—not wholesale disruption—but may fine-tune neural circuits for vocal communication.*

CONCEPT CHECK:

Q. The human-specific I197V variant in the NOVA1 gene is hypothesized to have contributed to speech evolution because when introduced into mice, it causes:

(a) gross defects in brain morphology and neuronal viability

(b) large changes in binding affinity of NOVA1 for all RNA targets

(c) altered alternative splicing of transcripts in vocalization circuits and subtle shifts in vocal patterns in mice

(d) complete loss of ultrasonic vocalisations in mice

Hint: *The human variant does not break general NOVA1 function or viability but fine-tunes splicing in vocal circuits.*

50. Genome India Project releases genomic data of 10,000 individuals publicly

Why in News?

GIP has made whole genome sequencing data of 10,000 Indians available via Indian Biological Data Centre.

Genome India Project (GIP) – Key Highlights & Updates

Overview & Objectives

- *Launched in 2020 under DBT, GoI to map Indian genetic diversity.*
- *Aim: Build a reference catalogue of genomic variants specific to Indian populations (ethnic, linguistic, geographic).*
- *Involves ~20 institutions across India (IISc, IITs, CSIR labs, etc.).*

CONCEPT CHECK:

Q. The "FeED Protocol" under which GIP data is shared primarily addresses which of the following concerns?

(a) Preventing any international access to the genomic data

Project Achievements & Data Release

- *Whole genome sequencing (WGS) completed for 10,000 samples across 83 population groups.*
- *Data archived at Indian Biological Data Centre (IBDC).*
- *Public accessibility via FeED protocol, governed by Biotech-PRIDE guidelines.*
- *In initial analysis: ~135 million genetic variants discovered; ~7 million novel (not in existing global databases).*
- *Genetic diversity aligns with linguistic & geographic divisions; many rare / low-frequency variants detected.*

Significance & Implications

- *Fills gap: global genomic databases underrepresent South Asians / Indian groups.*
- *Enables precision medicine, population-specific diagnostics, pharmacogenomics.*
- *Helps in studying disease predisposition, drug response variation in Indian populations.*
- *Also contributes to anthropological, migration, evolutionary genetics studies.*

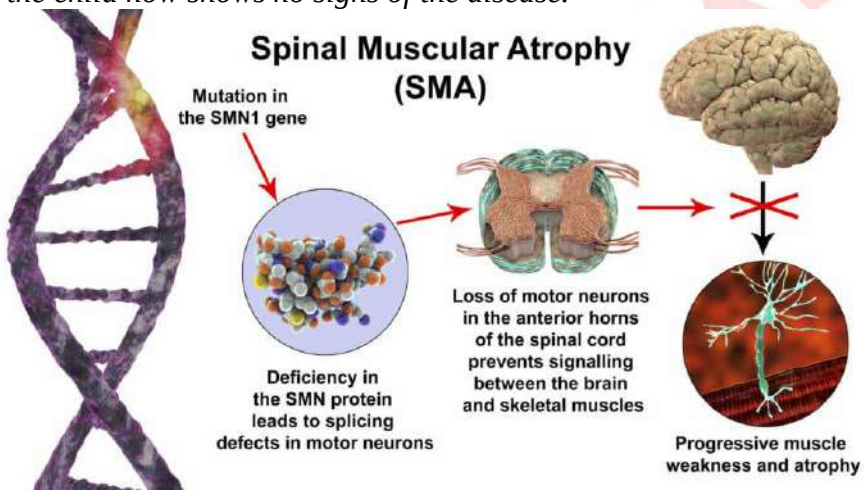
(b) Ensuring fair, ethical, and governed exchange of genomic data
(c) Fast encryption and decryption of entire genomes for researchers
(d) Forcing researchers to pay high licensing fees for access

Hint: *It is about protocols for exchange, not encryption in the narrow sense.*

51. First in-womb treatment for Spinal Muscular Atrophy (SMA) succeeds

Why in News?

Scientists have treated a fetus diagnosed with SMA using the drug risdiplam, and the child now shows no signs of the disease.



In Utero Treatment for SMA

Background & Rationale

- *SMA is caused by loss or mutation of the SMN1 gene, reducing survival motor neuron (SMN) protein → leads to degeneration of motor neurons.*
- *The disease pathology begins in utero, meaning neuronal damage starts before birth.*
- *Existing SMA therapies (nusinersen, onasemnogene abeparvovec, risdiplam) are given postnatally; outcomes improve if therapy starts early.*

The First Case: Prenatal Risdiplam Therapy

- *A fetus was diagnosed (via amniocentesis) with type-1 SMA: absence of SMN1 and two copies of SMN2.*
- *The mother took **risdiplam** (5 mg/day) from ~32 weeks + 5 days of gestation until delivery at 38 weeks + 6 days.*
- *Drug crossed placenta: in amniotic fluid ~33% of maternal plasma level; in cord blood ~69%.*
- *Post-birth, the child began risdiplam from day 8.*
- *At ~30 months old, **no clinical or lab evidence of SMA** has emerged.*

CONCEPT CHECK:

Q. Which of the following best describes the current regulatory framework for gene therapy in India?
(a) Governed solely by the Indian Council of Medical Research (ICMR) guidelines, with no statutory backing
(b) Regulated under the Gene Technology (Safety) Rules, 1989 and overseen by multiple committees including RCGM and GEAC
(c) Permitted freely under the Clinical Establishments Act, 2010
(d) Directly monitored by WHO through global treaties

Hint: *Think about Biosafety & GEAC framework.*

52. Pink Fire-Retardant (Phos-Chek) Gains Attention Amidst LA Wildfires

Why in News?

Bright pink fire retardant, Phos-Chek, was widely deployed from aircraft to curb wildfires in Los Angeles, drawing scrutiny over its composition and environmental impact.

What is Phos-Chek & How It Works?

- *Brand of aerial fire retardants / gels produced by Perimeter Solutions*
- *Usually consists of ammonium phosphate / ammonium polyphosphate salts (fertiliser-type) + water + dyes + thickeners*
- *Dye (pink/red) helps visibility so pilots can see where retardant has been dropped*

Applied ahead of fire fronts to coat vegetation, slow combustion by altering decomposition and reducing oxygen supply

CONCEPT CHECK:

Q. Phos-Chek, recently seen in news, is:

(a) A phosphate-based aerial fire retardant used to combat wildfires

(b) A genetically modified crop developed for drought resistance

(c) A satellite system for early wildfire detection

(d) A bioengineered microorganism for degrading plastic waste

Hint: *Its pink colour has been in media visuals during California wildfires.*

 # Is it used in India?

Pratibimb PYQ Mentorship Program 2026

What is Pratibimb Mentorship?

Pratibimb Mentorship Program 2026 is designed to guide and support students aiming for success in the UPSC CSE 2026. Our program adopts a strategic, outcome-focused approach, providing continuous guidance from experienced mentors and UPSC toppers. We help students identify and strengthen their foundational skills, build their knowledge base, and focus on areas for growth by making them solve PYQs.

Highlights of the Programme

Mentorship Program is designed to assist aspirants in making notes & Answer Writing

Essay + Ethics GS-I to III **complete syllabus** coverage in 6 months

Kalam Golden Pages (KGP) Thematic coverage of Mains syllabus of specified Topics

Marks Improvement Booklet (MIB) to enrich your Mains answer writing.

Face 2 Face Evaluation for Internalization of Personal Feedback

Self-Assessment Report (SAR) is a TOOLKIT for objective assessment of answer on self-basis

Answer Sheet Points (ASP) from Model Answer

Workshop: Learning by doing approach

Salient Features of Mentorship Program

- GS Prelims Syllabus Covered in 150+ Subject Themes
- 23 Prelims Tests = 1100 MCQs (Includes PYQ, CSAT NDA, CDS, CAPF) with solution
- 1 Prelims Tests = 50 (GS) + 5 CSAT Questions
- Static Subject wise Notes, Kalam Golden Pages (KGP)
- K-Snippet 365: Summary of Current Affairs
- SAR: Self-Assissment Report
- 40 Half-Sectional Tests + 5 Essay Tests
- 5 Full Length Tests (after Prelims)
- 1 Half-Sectional Test = 10 Questions
- Content: Kalam Golden Pages & Marks Improvement Booklets (MIB) on Mains Topics (Society, Governance, etc.)
- Answer Writing & Face 2 Face Evaluation
- Mentorship: CSE Selected Candidates

SECTIONAL TESTS

Detailed Test Syllabus & Reference Study Material

Prelims Sectional Tests

SUBJECT	No. of Tests
Polity	5
Economy	3
Agriculture	2
Geography	3
Environment	2
S&T	2
History	4
Full Length Tests	2
Total Tests	**23**

Mains Sectional Tests

SUBJECT	No. of Tests
Polity & Gover.	5
Economy	3
Agriculture	2
Ethics	7
Essay	5
Society	2
Social Justice	1
IR	2
Security	2
Geography	3
Environment	2
S&T	2
History	4
Full Length Tests	5
Total Tests	**45**

Other Details

PYQ Answer Writing | Model Answer | Face-to-Face Evaluation

- Batch Starting From: **30th June,** 2025
- Course Completion: **8 Months**
- Mode: **Online/Offline**
- Validity: Till **Mains 2026**
- Test Timing: 5 PM - 6:30 PM

Fee
₹15,000/-

Enroll: https://bit.ly/4edRmsB

Concession Details

Kalam IAS Students: 20%	**UPSC Interview Student: 30%**	**Selected Students: 50%**

INTERNATIONAL RELATIONS

53. US further retreats from global bodies, exits WHO & UNHRC under "America First" drive

Why in News?

US has formally ordered withdrawal from WHO (effective Jan 2026) and exited UN Human Rights Council (UNHRC) as part of broader disengagement from multilateralism.

Withdrawal from UN Human Rights Council (UNHRC)

- *On 4 Feb 2025, US issued executive order to not participate in UNHRC and to terminate its representation.*
- *US will not seek election or maintain positions tied to UNHRC.*
- *It also announced halting funding to UNHRC.*
- *Decision includes non-participation in Universal Periodic Review (UPR), skipping its scheduled human rights report (Nov 2025)*
- *Many argue the move undermines US ability to influence norms & weakens accountability frameworks.*

Exit from World Health Organization (WHO)

- *US submitted formal notice to UN to withdraw effective 22 Jan 2026 (due 12-month notice)*
- *Reasons cited: mismanagement during COVID-19, perceived bias, disproportionate US burden.*
- *Funding pause, recall of US personnel, and cessation of ongoing WHO cooperation directed by executive order.*
- *US contribution to WHO (~18% of budget) implies substantial financial impact.*

Broader Pattern: Pullback from Global Institutions

- *US also targets UNRWA funding prohibition, and review of UNESCO engagement under same order binning agencies "contrary to US interest."*
- *Criticism of "anti-Israel bias" in UN bodies cited as a key rationale.*
- *Analysts see this as continuation of "America First" / neo-realist shift — prioritizing sovereignty over multilateral constraints.*

CONCEPT CHECK:

Q. Which IR (International Relations) theory or strand best captures the logic behind the U.S. retreat from multilateral bodies under "America First"?
(a) Liberal institutionalism
(b) Neoliberal institutionalism
(c) Neorealism / structural realism
(d) Constructivism
(e) Global governance theory

Hint: *Which theory treats institutions as secondary to states' power and interests?*

 # Will this make America Great again?

STATIC CONNECT:

United Nations System

Body	***Membership***	***Function***	***Decision-making***	***Funding***	***India's Position***
UNGA	*193*	*Main deliberative, policy, budgetary organ*	*1 country = 1 vote; simple / 2/3 majority for key issues*	*Approves UN budget (assessed contributions)*	*Founding member (1945); active in SDGs, peacekeeping, climate diplomacy*
UNSC	*15 (P5 + 10 elected for 2 yrs)*	*Maintains int. peace & security; sanctions; authorizes force*	*9 votes incl. P5 concurrence (Veto)*	*UN budget contributions*	*India elected **8 times** (latest 2021–22); part of **G4 push** for reforms*
ECOSOC	*54 (3-yr term; elected by UNGA)*	*Coordinates econ, social, humanitarian work; NGO consultation*	*Simple majority*	*UN regular budget*	*India member 2022–24; advocates Global South, SDGs,*

					equitable development
ICJ	*15 judges (9-yr term; elected by UNGA + UNSC)*	*Settles disputes b/w states; advisory opinions*	*Majority ruling*	*UN regular budget*	*Indian judge **Dalveer Bhandari** elected (2012, re-elected 2017)*
***WHO** (Specialized Agency)*	*194*	*Int. health; disease control; standards (IHR, vaccines)*	*WHA → 1 state = 1 vote*	*Assessed + voluntary contributions (~80% budget)*	*Founding member; strong role in smallpox eradication, COVID-19, TB control*
***UNHRC** (Subsidiary of UNGA)*	*47 (regional distribution; 3-yr term)*	*Promotes & protects HR; Universal Periodic Review (UPR)*	*Majority*	*UN regular budget*	*India elected for **2022–24** term; emphasizes Global South, balanced HR approach*

54. US President Trump threatens to retake control of the Panama Canal

Why in News?

He claimed Panama's transit fees are excessive and warned of undue Chinese influence.

Background & Legal Framework

- *Panama gained full control of the canal in **1999** under the **Torrijos-Carter Treaties**.*
- *A **Neutrality Treaty** ensures the canal remains neutral, but does not grant the U.S. a blanket right to retake control.*
- ***Panama has exclusive authority** to set tolls, subject to the treaty clause that they must be "just, reasonable, equitable."*
- ***Two ports adjacent** to the canal entrances are operated by a Hong Kong/Chinese company (CK Hutchison), but this does not equate to control over canal operations.*

Trump's Claims & Rationale

- *Trump says U.S. vessels are being overcharged and calls the fees "ridiculous."*
- *He warns the canal may "fall into the wrong hands," hinting at Chinese influence.*
- *Threats include demanding ownership be returned "quickly" and not ruling out military or powerful action.*

Current Status / Updates

CONCEPT CHECK:

Q. If the United States were to attempt to "retake control" of the Panama Canal citing "strategic necessity," which principle of international law would be most directly challenged?

(a) Doctrine of uti possidetis juris

(b) Principle of Sovereign Equality

(c) Doctrine of Adverse Possession

(d) Principle of Collective Security

Hint: *Sovereignty and Panama's exclusive authority under treaties are central.*

- *Panama has publicly rejected U.S. assertions about fee waivers for U.S. vessels.*
- *The Panama Canal Authority head reaffirmed that "rules are rules" and no exceptions will be made.*
- *U.S. has nominated an ambassador to Panama amid growing tensions.*
- *Panama is pushing back strongly; sovereignty remains a red line.*

Panama Canal – Quick Facts

- ***Location** → Isthmus of Panama, connects Atlantic (Caribbean Sea) ↔ Pacific Ocean*
- ***History** → Opened 1914; built by US after failed French attempt; transferred fully to Panama (1999, Torrijos–Carter Treaties)*
- ***Structure** → 80 km long; uses lock system to lift ships (Panamax, New Panamax after 2016 expansion)*
- *Global Trade Role → ~6% of world trade; saves ~13,000 km voyage (Cape Horn route); key for US, China, Japan trade*
- ***Current Status** → Facing drought-induced water shortage (2023–24) → restrictions on ship traffic, delays in cargo movement*

55. China begins work on world's largest hydropower dam on Brahmaputra (Yarlung Zangbo)

Why in News?

India and downstream neighbours raise alarm over potential reduction in water flows and strategic risks.

China's Mega-Dam Project

- *Name: Medog Hydropower / "Yarlung Zangbo hydropower" project*
- *Location: Lower reaches of Yarlung Tsangpo in Medog (Nyingchi), Tibet Autonomous Region*
- *Status: Construction commenced on 19 July 2025*
- *Scale / Specs:*
  - *Installed capacity: ~ 60,000 MW (largest planned)*
  - *Annual generation: ~ 300 billion kWh (≈ three times output of Three Gorges)*
  - *Cost / Investment: ~ 1.2 trillion yuan (≈ US$167–170 billion)*
  - *Design: Five cascading hydropower stations*

Hydrology & River Course

- *Yarlung Tsangpo becomes Brahmaputra as it enters India, flowing via Arunachal Pradesh & Assam*
- *Project sited near the "Great Bend" of the river before it enters India as the Siang river*

Concerns & Risks (Downstream & Strategic)

Water Flow & Seasonal Reduction

- *Indian estimate: flow reduction up to **85 %** during dry season*
- *Possible diversion: ~ **40 billion cubic metres** annually (~ one-third of flow at key border point)*

CONCEPT CHECK:

Q. Which of the following are likely ecological consequences of large dams in the Himalayas?

1) Fragmentation of aquatic habitats
2) Increase in sediment deposition downstream
3) Reservoir-induced seismicity
4) Loss of floodplain fertility

(a) 1, 2, and 3 only
(b) 1, 3, and 4 only
(c) 2 and 4 only
(d) 1 and 4 only

***Hint:** Dams trap sediment, so downstream fertility reduces, not increases.*

 # Water diplomacy is theme of this year developments

- *Impact on Assamese city Guwahati: water supply decline of ~ 11% vs 25% (without countermeasures)*
- *Reduction of sediment supply downstream → agricultural & ecological effects*

Ecological & Geophysical Risks

- *Seismic zone & landslide risk; dam in an area of extreme terrain*
- *Alteration of river ecology, biodiversity, habitat fragmentation*
- *Uncertainties around sudden water release (flood hazard)*

Strategic / Political Challenges

- *Weaponisation risk: Ability to control or cut off flow as leverage in conflict*
- *Lack of transparency: China's limited disclosure of hydrological data and plans*
- *Downstream states (India, Bangladesh) concerned about sovereignty & treaty frameworks*

Indian Response & Countermeasures

- *India has registered diplomatic protest and asked China to ensure downstream interests not harmed*
- *India accelerating its own dam plans on the Siang / Upper Brahmaputra to act as buffer / counterbalance*
- *Local opposition: Survey work in Arunachal Pradesh faced protests, fear of submergence & displacement*
- *Assam CM's view: Not immediately worried; suggests Brahmaputra's flow is majorly rain-fed*

56. Interpol rolls out Silver Notice to trace illicit assets globally

Why in News?

Interpol has published its first-ever Silver Notice to support tracing and recovery of criminal assets.

Silver Notice: What & Why

- *Newest addition to Interpol's colour-coded Notice system.*
- *Focus on asset tracing / recovery, not arrest.*
- *Targets assets from crimes: fraud, corruption, drug trafficking, environmental crime, etc.*
- *Helps in locating, identifying, monitoring (discreetly) illicit assets (real estate, vehicles, accounts, businesses)*

CONCEPT CHECK:

Q. Which of the following best describes the purpose of INTERPOL's newly introduced Silver Notice (2025 pilot)?

(a) To provisionally arrest a person wanted by a state for extradition

(b) To collect information about a person's identity, location or activities

(c) To trace, monitor, and facilitate recovery of illicit assets linked to crime

(d) To alert of imminent threats such as weapons, chemical agents, or terrorism

 # What notice were issued against Vijay Mallya and Nirav Modi?

Notice Colour	Purpose / Function	Who Issues / At Whose Request	Key Features / Examples
Red Notice	Locate & provisionally arrest a wanted person pending extradition	Member countries / International Tribunals	✦ Most known → often misreported as "international arrest warrant" (not legally binding)
Blue Notice	Collect info on identity, location, activities of a person	Member countries	✦ Allows questioning / info gathering
Green Notice	Provide warnings about persons likely to commit crimes	Member countries	✦ Info about criminal's modus operandi / threats
Yellow Notice	Help locate missing persons (esp. minors) or identify persons unable to identify themselves	Member countries / Parents / Guardians (through police)	✦ Often used for missing children, mentally ill persons
Black Notice	Seek info on unidentified bodies	Member countries	✦ Helps identify deceased persons across borders
Orange Notice	Warn of imminent events, dangerous materials, parcels, weapons	Member countries / International organisations	✦ Used in terror threats, hazardous shipments
Purple Notice	Seek info on methods of hiding, concealing objects / modus operandi	Member countries	✦ Example: trafficking concealment techniques
Interpol-UN Security Council (UNSC) Special Notice	Target individuals & entities subject to UNSC sanctions (e.g. Al-Qaeda, Taliban)	Issued jointly with UNSC	✦ Mandated under UNSC resolutions
Silver Notice (new, 2025)	Trace & monitor illicit assets linked to crime (fraud, corruption, drugs, etc.)	Member countries (pilot: 52 states till Nov 2025)	✦ Focus on asset tracing/recovery → non-coercive, confidential

INTERNAL SECURITY

57. Joint military exercises gain momentum in 2025

Why in News?

Multiple bilateral and multilateral defence drills (Dharma Guardian, Komodo, Cyclone 2025, etc.) are being held to boost interoperability and regional security cooperation.

Key Military Exercises in January-February 2025

Dharma Guardian (India – Japan)

- *6th edition held from 24 Feb to 9 Mar 2025 in East Fuji Training Area, Japan*
- *Focus on urban warfare, counter-terrorism and joint tactical drills under UN mandate*
- *India deployed ~120 personnel, alongside counterpart Japan troops*

Komodo (Multilateral Naval Exercise)

- *MNEK 2025 hosted by Indonesia; over 20 navies participated including U.S., India, China, Russia*
- *Indian Navy sent INS Shardul and P-8I aircraft to Bali to take part*
- *Theme: "Maritime Partnership for Peace and Stability"; includes disaster response protocols*

Cyclone 2025 (India – Egypt)

- *Bilateral drill held at Mahajan Field Firing Range, Rajasthan; duration 14 days*
- *Aims to enhance interoperability of special forces in desert terrain*

CONCEPT CHECK:

Q. Exercise Dharma Guardian is conducted between India and which country?
(a) France
(b) Japan
(c) Indonesia
(d) Australia

Hint: Think of East Fuji Training Area in 2025.

58. Triple Induction: INS Nilgiri, INS Surat & INS Vaghsheer Commissioned into Indian Navy

Why in News?

On 15–16 January 2025, India inducted a new stealth frigate, a destroyer and a submarine in one day to bolster naval might.

Ship	Project / Class	Type	Displacement	Key Features	Builder	Current Status
INS Nilgiri	**Project 17A** (Nilgiri-class frigate)	Stealth guided-missile frigate	~6,700 t	→ Stealth design, AESA radar, BRAHMOS & Barak-8 SAMs → Helicopter deck for ALH/Seaking	Mazagon Dock Shipbuilders Ltd (MDL), Mumbai	Lead ship of 7-frigate P-17A program; joined **Eastern Naval Command (Vizag)**
INS Surat	**Project 15B** (Visakhapatnam-class destroyer)	Stealth guided-missile destroyer	~7,400 t	→ ↑ automation & AI integration → BRAHMOS, MRSAM, Torpedoes → Multi-role (AAW, ASW, ASuW)	MDL, Mumbai	4th & last ship of P-15B; conducted **MRSAM missile trials**; overseas deployment to Jeddah (2025)

INS Vaghsheer	***Project 75*** *(Kalvari-class / Scorpene)*	*Diesel-electric attack submarine*	*~1,615 t (surfaced), ~1,775 t (submerged)*	*→ Diving depth ~350 m → 18 torpedoes / Exocet missiles → Stealth, noise suppression tech*	*MDL (under ToT from Naval Group, France)*	*6th & last Scorpene; strengthens submarine arm of Western Naval Command*

59. DDoS Cyberattack Disrupts Kaveri 2.0 Portal

Why in News?

Karnataka's property registration portal (Kaveri 2.0) was incapacitated by a large-scale DDoS attack, causing outages.

DDoS Attack on Kaveri 2.0

Portal Overview & Relevance

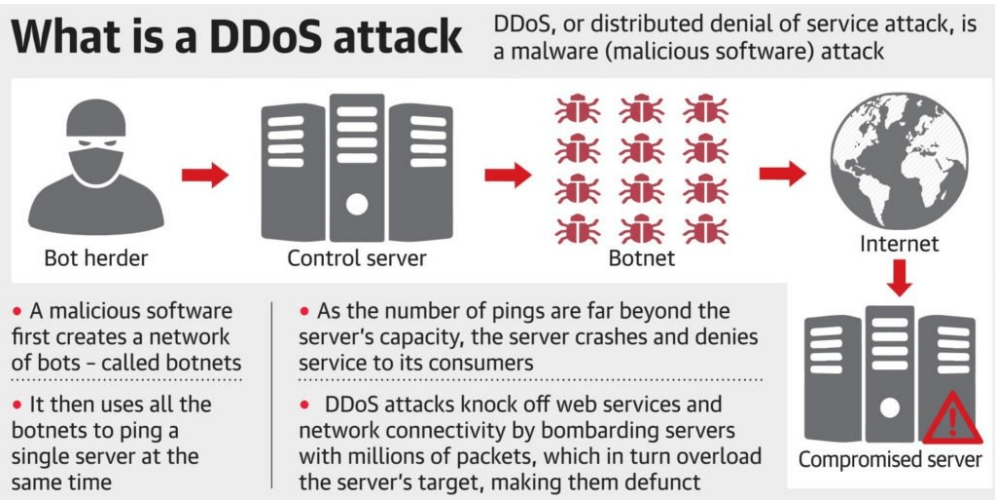
- *Kaveri 2.0: web-based application for property registration in Karnataka, handling services like Encumbrance Certificate (EC), certified copies, etc.*
- *Critical infrastructure: processes thousands of registrations daily; contributes to state revenue.*

Attack Profile & Modus Operandi

- *Attack Periods: December 2024 & January 2025.*
- *Nature: Distributed Denial of Service (DDoS) using bots / automated tools to flood portal with traffic.*
- *Request Surge: ~ 6.2 lakh malicious requests in 2 hours for EC searches (≈ 8× normal load)*
- *Fake Accounts & IPs: Attackers created dummy user accounts (62 email IDs) from 14 IPs to generate load.*
- *Exploitation of Search Module: Focus on keyword-based searches to overwhelm backend.*

Impact & Disruptions

- *Service Outage: Registrations and EC/CC services severely disrupted for nearly a month.*
- *Revenue Hit: Daily registration volumes plummeted; state revenue collections impacted.*
- *Recovery Signals: On February 5, services restored; registrations rose (e.g. 7,225 on one day) indicating normalization.*
- *Legal Action: FIR lodged under Sections 66 & 66D of IT Act, 2008.*



CONCEPT CHECK:

Q. Which of the following best captures the primary difference between a volumetric DDoS attack and an application-layer DDoS attack?

(a) Volumetric attacks aim to exhaust network bandwidth; application-layer attacks aim to exhaust server resources (CPU / memory)

(b) Volumetric attacks use botnets; application-layer attacks only use insider actors

(c) Volumetric attacks target DNS infrastructure; application-layer attacks target user interfaces

(d) Volumetric attacks can only use UDP; application-layer attacks only use TCP

Hint: *Think in terms of where in the stack the resource exhaustion is focused (network vs server).*

STATIC CONNECT:
Major Cyber Attacks

Type of Attack	Mode / Mechanism	Target	Impact	Example
DDoS (Distributed Denial of Service)	*Flooding servers with fake traffic via botnets*	*Websites, govt portals, banks*	*Service outage, slowdown*	*Kaveri 2.0 Portal attack (2024-25)*
Phishing	*Fake emails/SMS/websites tricking users into sharing credentials*	*Individuals, employees*	*Data theft, financial fraud*	*2020 Phishing emails during Covid relief schemes*
Ransomware	*Malicious software encrypts files; demands ransom in crypto*	*Hospitals, corporates, govt*	*Data lockout, financial loss*	*WannaCry (2017), AIIMS Delhi attack (2022)*
Malware / Spyware	*Malicious code secretly installed in systems*	*PCs, mobiles, servers*	*Data theft, surveillance, sabotage*	*Pegasus spyware (2019)*
SQL Injection	*Injecting malicious SQL queries via input fields*	*Websites with databases*	*Data leak, manipulation, unauthorised access*	*2014 Yahoo database breach*
Man-in-the-Middle (MITM)	*Intercepting communication between 2 parties*	*Online transactions, Wi-Fi*	*Credential theft, fraud*	*Fake Wi-Fi hotspots capturing banking logins*
Zero-day Exploit	*Exploiting unpatched software vulnerabilities*	*OS, apps, critical infra*	*Remote control, espionage*	*Stuxnet attack on Iran's nuclear facility*
Credential Stuffing	*Automated use of leaked usernames & passwords*	*Online accounts*	*Account takeover, fraud*	*LinkedIn credential stuffing attacks*
DNS Spoofing / Cache Poisoning	*Redirecting users to fake sites via tampered DNS records*	*Users accessing websites*	*Phishing, malware spread*	*Brazilian banking DNS hijack cases*
Supply Chain Attack	*Compromise via third-party vendors/software*	*Govt, corporates*	*Large-scale infiltration*	*SolarWinds hack (2020)*

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Highlights of the Program

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- **Kalam Golden Pages** (KGP) Thematic coverage of Mains syllabus of specified Topics
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- **Workshop**: Learning by doing approach
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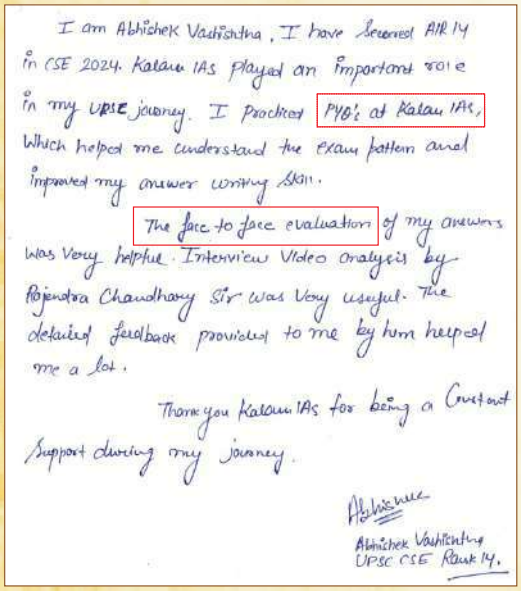
CSE 2024 TOPPERS

Abhishek Vashishtha, **AIR-14** [CSE 2024]



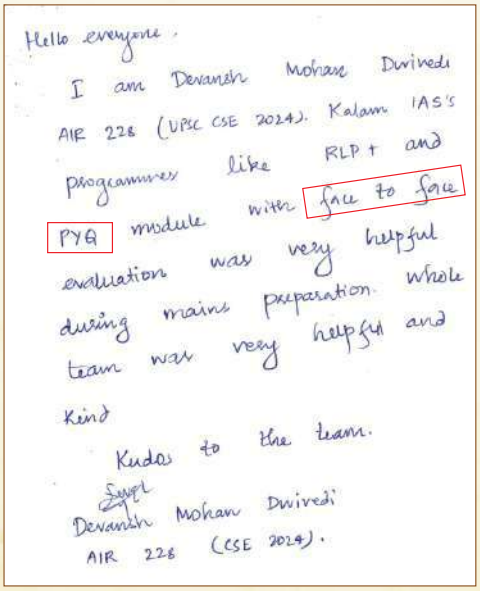
I am Abhishek Vashishtha, I have Secured AIR 14 in CSE 2024. Kalam IAs played an important role in my UPSC journey. I Practiced PYQ's at Kalam IAs, which helped me understand the exam pattern and improved my answer writing skill.

The face to face evaluation of my answers was very helpful. Interview Video analysis by Rajendra Chaudhary Sir was very useful. The detailed feedback provided to me by him helped me a lot.

Thank you Kalam IAs for being a Constant Support during my journey.

Abhishek Vashishtha
UPSC CSE Rank 14.

Devansh M. Dwivedi, **AIR-228** [CSE 2024]



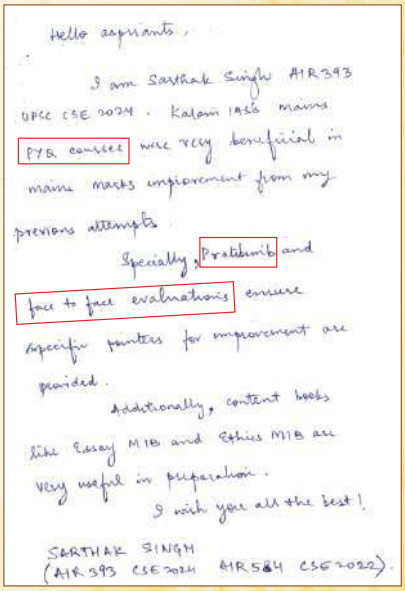
Hello everyone,

I am Devansh Mohan Dwivedi AIR 228 (UPSC CSE 2024). Kalam IAS's programmes like RLP + and PYQ module with face to face evaluation was very helpful during mains preparation. Whole team was very helpful and kind

Kudos to the team.

Devansh Mohan Dwivedi
AIR 228 (CSE 2024).

Sarthak Singh, **AIR-393** [CSE 2024]



Hello aspirants,

I am Sarthak Singh AIR393 UPSC CSE 2024. Kalam IAS's mains PYQ courses were very beneficial in mains marks improvement from my previous attempts.

Specially Pratibimb and face to face evaluations ensure specific pointers for improvement are provided.

Additionally, content books like Essay MIB and Ethics MIB are very useful in preparation.

I wish you all the best!

SARTHAK SINGH
(AIR-393 CSE 2024 AIR584 CSE 2022)

GOVERNMENT SCHEMES

MINISTRY OF AGRICULTURE & FARMERS WELFARE (MoA&FW)

60. Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA, 2018)

- ***Why in News*** → *Govt approved continuation till 2025-26 (15th Finance Commission cycle)*
- ***Aim*** → *Ensure Minimum Support Price (MSP) operations & farmer income protection*
- ***Components*** →
  - ***Price Support Scheme (PSS)*** – *NAFED/FCI/CWC procure pulses, oilseeds, copra at MSP; cost borne by Centre*
  - ***Price Deficiency Payment Scheme (PDPS)*** – *Farmers sell in open market; States pay MSP-market price gap; avoids storage burden*
  - ***Private Procurement & Stockist Scheme (PPSS)*** – *Private agencies allowed to procure at MSP with incentives; pilot basis, limited uptake*
  - *Significance → Strengthens MSP mechanism beyond cereals; reduces distress sales*

Component	Full Form	Implementing Agency	Mechanism	Key Points
PSS	Price Support Scheme	NAFED, FCI, CWC (Central Agencies) + State agencies	Govt agencies procure notified crops at MSP	Covers pulses, oilseeds, copra → cost borne by Centre
PDPS	Price Deficiency Payment Scheme	Implemented by State Govts (Centre shares cost)	Farmers sell in open market → Govt pays difference between MSP & actual selling price	No physical procurement → saves storage/transport cost
PPSS	Private Procurement & Stockist Scheme	Private players (selected by States)	Private entities allowed to procure at MSP if market price < MSP → incentivised via service charges	Pilot basis, limited adoption due to low participation

61. Pradhan Mantri Fasal Bima Yojana (PMFBY, 2016)

- ***Why in News*** → *Extended till 2025-26 with Restructured Weather Based Crop Insurance Scheme (RWBCIS)*
- ***Premium*** → *Farmers pay 2% (Kharif), 1.5% (Rabi), 5% (horticulture); balance subsidised by Centre & States*
- ***Coverage*** → *Crop yield loss, prevented sowing, post-harvest losses (14 days), localised calamities*
- ***Implementing Agencies*** → *Agriculture Insurance Company of India (AIC) + empanelled private insurers; oversight by State Govts*
- ***Scale*** → *~5 crore farmers covered annually; ~40% of Gross Cropped Area insured*
- ***Reforms*** → *Voluntary enrolment (earlier compulsory for loanee farmers), States allowed to customise*

62. Prime Minister Dhan Dhaanya Krishi Yojana (PM-DKDY, 2025)

- ***Why in News*** → *Launched in Union Budget 2025-26*
- ***Target*** → *100 low-productivity districts; ~1.7 crore farmers*
- ***Funding*** → *₹24,000 crore/year × 6 yrs = ₹1.44 lakh crore*
- ***Focus Areas*** → *Irrigation & water infra, crop diversification, post-harvest storage, agri-credit access*
- ***Implementation*** → *District-level "Dhan Dhaanya Krishi Kendras"; convergence with PM-Kisan, PMKSY (Pradhan Mantri Krishi Sinchayee Yojana), PMFBY, AIF*

63. Agriculture Infrastructure Fund (2020-29)

- ***Why in News*** → *Expanded scope (2025) → renewable energy infra, convergence with PM-KUSUM A (solarisation of agriculture)*
- ***Corpus*** → *₹1 lakh crore; 3% interest subvention + Credit Guarantee (CGTMSE)*
- ***Beneficiaries*** → *Farmer Producer Organisations (FPOs), Primary Agricultural Credit Societies (PACS), SHGs, startups, state agencies*
- ***Projects*** → *Warehouses, cold chains, food parks, primary processing, solar power plants*
- ***Impact*** → *~30,000 projects sanctioned by 2024*

64. AgriSURE Fund (2025)

- ***Why in News*** → *Launched with corpus ₹750 crore to promote agri startups*
- ***Nodal Agency*** → *NABVENTURES (venture capital arm of NABARD)*
- ***Structure*** → *Fund of Funds (₹450 cr) invests in SEBI-registered AIFs + Direct Equity Fund (₹300 cr) invests directly in startups*
- ***Duration*** → *10 yrs (+2 yrs extension)*
- ***Focus*** → *Agri-tech (AI, drones, biotech, precision farming, food processing, waste mgmt)*
- ***Target*** → *Support ~85 startups in 10 years*

65. Namo Drone Didi Scheme (2024)

- ***Why in News*** → *Expanded in Budget 2025-26*
- ***Aim*** → *Provide agriculture drones to Women Self-Help Groups (SHGs) at subsidised rates (up to 80%)*
- ***Use Cases*** → *Pesticide/fertiliser spraying, sowing, crop monitoring*
- ***Objective*** → *Women empowerment + digital agriculture adoption*

MINISTRY OF JAL SHAKTI

66. Jal Jeevan Mission (JJM, 2019)

- ***Why in News*** → *11 States/UTs achieved 100% tap water coverage (Feb 2025)*
- ***Goal*** → *Har Ghar Jal → Functional Household Tap Connection (FHTC) to every rural HH, 55 litres per capita per day (lpcd)*
- ***Funding pattern*** → *UTs (100% Centre), NE/Himalayan (90:10), Others (50:50)*
- ***Progress (Feb 2025)*** → *15.44 cr households (≈79.7%); 9.3 lakh schools & 9.7 lakh anganwadis connected*
- ***100% States/UTs*** → *Goa, Gujarat, Punjab, Haryana, Telangana, HP, Puducherry, A&N, D&NH & D&D, Mizoram, Arunachal Pradesh*
- ***Extension*** → *Till 2028 (focus on water quality, O&M, source sustainability)*

MINISTRY OF WOMEN & CHILD DEVELOPMENT (MoWCD)

67. Beti Bachao Beti Padhao (BBBP, 2015)

- ***Why in News*** → *Completed 10 yrs in Jan 2025*
- ***Tri-ministerial*** → *MoWCD + Ministry of Health & Family Welfare (MoHFW) + Ministry of Education (MoE)*
- ***Aim*** → *Prevent female foeticide, improve Child Sex Ratio (CSR), promote girls' education*
- ***Tools*** → *Mass campaigns, community mobilisation, incentive schemes, Sukanya Samriddhi Yojana linkages*
- ***Impact*** → *CSR improved in >100 districts; scheme expanded to include girls' higher education & skill development*

MINISTRY OF HEALTH & FAMILY WELFARE (MoHFW)

68. Intensified Special Non-Communicable Diseases (NCD) Screening Drive (2025)

- **Why in News** → *Launched for universal screening of 30+ age group*
- **Target** → *100% screening of all persons aged 30+*
- **Diseases Covered** → *Hypertension, Diabetes, Oral Cancer, Breast Cancer, Cervical Cancer*
- **Mode** → *Through Health & Wellness Centres (Ayushman Bharat)*
- **Aim** → *Early detection, referral, treatment → reduce NCD burden*

MINISTRY OF LAW & JUSTICE

69. DISHA (Designing Innovative Solutions for Holistic Access to Justice, 2025)

- **Why in News** → *Highlighted in govt announcements (2025)*
- **Aim** → *Improve access to justice using technology & community mechanisms*
- **Components** → *Digital legal literacy, Alternate Dispute Resolution (ADR), online dispute resolution, mobile legal clinics*
- **Focus** → *Women, rural poor, marginalised groups*

MINISTRY OF EARTH SCIENCES (MoES)

70. PRITHVI VIGYAN (Promoting Research in Earth Systems Science, Technology, & Human Resource Development, 2021–26)

- **Why in News** → *Highlighted in 2025 as integrated Earth system science programme*
- **Budget** → *₹4,797 crore (2021–26)*
- **Sub-schemes** →
  - *ACROSS – Atmosphere & Climate Research, Modelling, Services*
  - *O-SMART – Ocean Services, Marine Resources & Tech*
  - *PACER – Polar Science & Cryosphere Research*
  - *SAGE – Seismology & Geosciences*
  - *REACHOUT – Research, Education, Training, Outreach*
- **Agencies** → *Indian Meteorological Department (IMD), INCOIS, NIOT, NCESS, NCPOR*
- **Aim** → *Strengthen forecasting, disaster early warning, climate modelling, polar studies, HRD in Earth sciences*

MISCELLANEOUS

71. Padma Awards & Service Medals 2025 on 76th Republic Day

Why in News?

Government announced Padma civilian awards and 942 gallantry/service medals for security & civil personnel for Republic Day 2025.

Padma Awards 2025

- *Total awards = 139 (including 1 duo case)*
- *Distribution: 7 Padma Vibhushan, 19 Padma Bhushan, 113 Padma Shri*
- *Women awardees = 23*
- *Foreign/NRI/PIO/OCI = 10*
- *Posthumous awards = 13*

Gallantry & Service Medals 2025

- *Total recipients: 942 personnel from Police, Fire, Home Guard & Civil Defence, Correctional Services*
- ***Gallantry Medals***

- *Medal for Gallantry (GM) awarded = 95 (78 police + 17 fire service)*
- *Geographic breakdown: 28 in Left Wing Extremism areas, 28 in Jammu & Kashmir, 3 in North-East, 36 in other regions*

- ***Service Medals***
  - *President's Medal for Distinguished Service (PSM): 101 awarded*
    - *Breakdown: Police = 85, Fire = 5, Civil Defence & Home Guard = 7, Correctional Service = 4*
  - *Medal for Meritorious Service (MSM): 746 awarded*
- ***Breakdown:*** *Police = 634, Fire = 37, Civil Defence & Home Guard = 39, Correctional Service = 36*

About Padma Awards

- *Instituted: 1954*
- ***2nd highest civilian honours*** *after Bharat Ratna*
- *3 categories:*
  - ***Padma Vibhushan*** *→ exceptional & distinguished service*
  - ***Padma Bhushan*** *→ distinguished service of high order*
  - ***Padma Shri*** *→ distinguished service in any field*
- ***Fields:*** *Art, Literature, Education, Science, Social Work, Public Affairs, Sports, Medicine, etc.*
- *Announced* ***every year*** *on Republic Day Eve*
- *Conferred by President at Rashtrapati Bhavan (March–April investiture ceremony)*
- *Selection: Padma Awards Committee (PM recommends names to President)*
- ***Foreigners, NRIs, PIOs, OCI eligible***
- *Cannot be used as title →* ***Article 18*** *(Abolition of Titles)*
- ***Not a right*** *→ Govt can revoke*

Police / Fire / Civil Defence / Correctional Service Medals (Instituted under MHA)

Gallantry Medals

- *Police Medal for Gallantry (PMG) → for conspicuous courage & gallantry in saving life, property or maintaining law & order*
- *Can be awarded posthumously*
- *Ribbon: Red with blue edges*

Distinguished Service

- *President's Police Medal for Distinguished Service (PPM/PSM) → for long & distinguished service of exceptional order*

Meritorious Service

- *Police Medal for Meritorious Service (MSM) → for valuable service characterized by resource & devotion*

Other Services

- *Fire Service Medals, Home Guard & Civil Defence Medals, Correctional Service Medals*
- *Similar classification (Gallantry, Distinguished, Meritorious)*
- *Announced on Republic Day & Independence Day every year*

SOCIETY & SOCIAL ISSUES

72. Engaging Men & Boys: UNESCO-ICRW report charts pathways to gender equality in India

Why in News?

UNESCO & ICRW released "Engaging Men and Boys: A Report on Pathways to Gender Equality in India" to focus on harmful gender norms and male engagement.

Engaging Men & Boys — Gender Equality in India

Background & Purpose

- *Builds on **UNESCO's "Transforming MEN'talities"** initiative, focusing on masculinities & gender norms.*
- *Seeks to understand how men & boys can be allies in gender equity, not just targets of messaging.*
- *Draws on 10 case studies across India from diverse contexts (rural/urban, different states) to showcase best practices & challenges.*

Key Findings & Insights

- *Programs that adopt gender-transformative (vs only gender-sensitive) approaches yield better changes in attitudes & behaviours.*
- *Entry points that resonate with men/boys (sports, livelihood, family roles) help in reducing resistance.*
- *Safe dialogue spaces for men & boys are critical for reflection & change.*
- *Collaboration across stakeholders (NGOs, govt, communities) enhances legitimacy & reach.*
- *Intersectionality matters — identity axes (caste, class, sexuality) influence how norms operate & must be addressed.*

CONCEPT CHECK:

Q. The report "Engaging Men & Boys: Pathways to Gender Equality in India" was jointly published by:

(a) UNESCO and International Centre for Research on Women (ICRW)
(b) UNICEF and UNDP India
(c) Ministry of Women & Child Development and NITI Aayog
(d) World Bank and ICRW

***Hint:** Think UN agency + global gender research institution.*

 # What one action you will take to uphold gender inequality in your life?

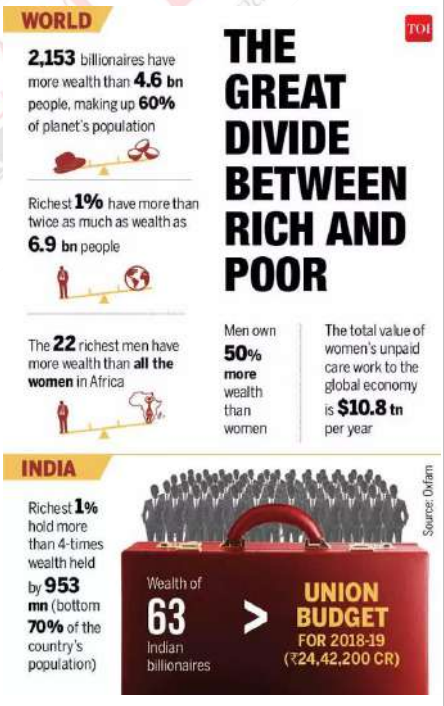
73. Oxfam report shows richest 1% now hold 45% of global wealth, inequality surges

Why in News?

***Oxfam's Takers Not Makers** reveals billionaire wealth grew by US$2 trillion in 2024, amid extreme concentration of global wealth.*

Key Findings: Wealth & Inequality

- *Richest **1% now control ~45% of global wealth** (up from ~43%).*
- *Billionaire wealth rose three times faster in 2024 than 2023, adding ~US$2 trillion.*
- *On average ~4 new billionaires were created every week in 2024.*
- *Majority (~60%) of billionaire wealth is "taken", i.e., from inheritance, monopoly, cronyism, corruption—not from entrepreneurial effort.*
- *Global South transfers ~US$30 million/hour to richest 1% in the Global North via financial mechanisms.*
- *Over 2023–2024, financial systems, tax abuse, profit repatriation drive wealth extraction from poorer nations.*



CONCEPT CHECK:

Q. The "Takers Not Makers" report, highlighting how billionaire wealth surged by US$2 trillion in 2024, was published by:

(a) World Bank
(b) Oxfam International
(c) International Monetary Fund (IMF)
(d) World Economic Forum

***Hint:** Known for annual inequality reports, not a multilateral bank.*

 # What is your take on India vs World on inequality?

STATIC CONNECT:

Key Indices / Ranking Reports by Oxfam

- ***Commitment to Reducing Inequality Index (CRI):** Assesses government action on public services, taxation, labour rights to reduce inequality*
- ***Best States to Work Index:** Ranks U.S. states on wages, worker protections, rights to organize*

HISTORY, ART & CULTURE

74. Launch of Gyan Bharatam Mission for Manuscript Conservation

Why in News?

*The **Ministry of Culture** has rolled out "Gyan Bharatam" as a national initiative to preserve, digitise and disseminate India's manuscript heritage.*

***Adoption of Delhi Declaration** (Gyan Bharatam Sankalp Patra) pledging collective efforts to preserve, digitise, disseminate manuscripts.*

Gyan Bharatam Mission

Background & Rationale

- *Builds on National Mission for Manuscripts (launched 2003) as its foundation.*
- *Recognises that India's manuscript corpus (on palm leaves, birch bark, copper plates, handmade paper, etc.) holds invaluable knowledge across disciplines (philosophy, sciences, arts) needing protection.*
- *Many manuscripts are scattered across public institutions, temples, private collections — lack of uniform documentation, risk of damage or decay.*

Objectives & Scope

- *Survey & document over one crore manuscripts across India (public, private custodians)*
- *Conservation & physical restoration of fragile texts using modern scientific techniques*
- *Large-scale digitisation, creation of a National Digital Repository for manuscripts*
- *Leverage AI / digital tools (e.g. handwriting recognition, metadata, portals) to enable access, searchability, translation*
- *Capacity building: train experts in manuscriptology, palaeography, conservation science*
- *Engage public & custodians via collaborations, challenges (e.g. "Gyan-Setu")*

CONCEPT CHECK:

Q. The "Delhi Declaration (Gyan Bharatam Sankalp Patra)" adopted with the launch of the Gyan Bharatam Mission primarily emphasises:

(a) India's commitment to repatriate manuscripts from abroad

(b) Collective pledge to preserve, digitise, and disseminate manuscripts

(c) Restricting public access to sensitive manuscripts

(d) Commercialisation of manuscript-based publications

***Hint:** Focus is on collective effort, not restriction.*

 # Will it be available to public also?

75. Battle of Karnal (24 Feb 1739)

Why in News?

Anniversary of the battle, remembered as decisive end of Mughal supremacy.

Details of Battle of Karnal

- *Fought b/w **Mughal Emperor Muhammad Shah "Rangeela" vs Nadir Shah of Persia***
- *Location → Karnal (Haryana, ~110 km from Delhi)*
- *Mughal army strength → ~1.2 lakh vs Persian ~55,000 → yet Mughals lost*
- ***Causes of defeat** → Poor leadership, lack of coordination, corruption, absence of efficient command structure*
- ***Result** → Mughal army routed within 3 hrs*

Aftermath

- *Nadir Shah entered Delhi (March 1739)*
- *Sack of Delhi → "Qatl-e-aam" (massacre), ~20,000–30,000 civilians killed*
- *Loot included → **Peacock Throne, Koh-i-Noor, Darya-i-Noor diamond***
- *Treaty → Muhammad Shah ceded all territories W. of Indus to Persia*
- *Nadir Shah imposed 700 crore INR equivalent tribute → India's economy shaken*

CONCEPT CHECK:

Q. Which of the the following statements about the aftermath of the Battle of Karnal is incorrect?

(a) Delhi was sacked and massive civilian killings followed

(b) The Peacock Throne and Koh-i-Noor were taken by Nadir Shah

(c) Muhammad Shah ceded all territories east of the Indus to Persia

(d) The Mughal treasury was heavily plundered and a huge indemnity was imposed

***Hint:** Persia's gains were west of the Indus, not east.*

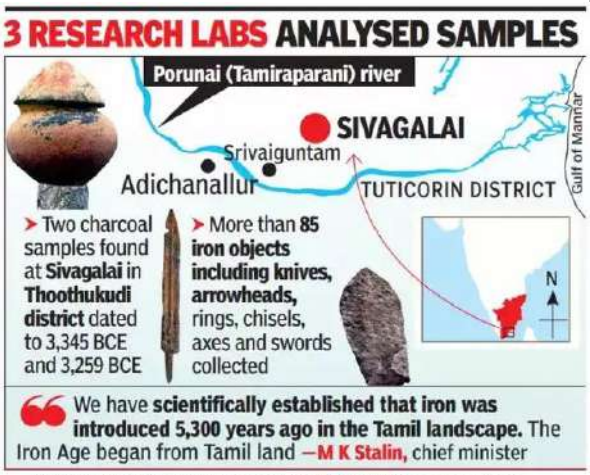
76. Tamil Nadu pushes Iron Age origin to 3,345 BCE, challenging global timelines

Why in News?

Radiometric dating study suggests Iron Age metallurgy in TN began ~3,345 BCE — ~2,000 yrs earlier than believed.

Revised Timeline & Significance

- *Study **"Antiquity of Iron: Recent Radiometric Dates from TN"** (K. Rajan & R. Sivanantham).*
- *Earliest iron use → ~**3,345 BCE & ~3,259 BCE** (urns at Sivagalai).*
- *Predates **Hittite Empire iron** (~1,380 BCE) → earlier by ~2 millennia.*
- *Labs (Beta Analytics, PRL, Birbal Sahni Inst.) corroborated via charcoal & potsherds.*
- *Sites: Sivagalai, Mayiladumparai → iron artifacts dated ~2,172–3,345 BCE.*
- *Argues: South India in Iron Age while N. India still in Copper/Bronze → divergent techno-cultural paths.*



Times of India, ***Tamil Nadu may be the birthplace of Iron Age, says study***, A Ragu Raman / TNN / Updated: Jan 24, 2025, 14:31 IST

Challenges & Scholarly Debate

- ***Stratigraphy issues** → mixing of materials, selective charcoal reporting.*
- ***Contradiction:** paddy sample from same urn → ~1,155 BCE (vs earlier charcoal).*
- *Debate if finds = sustained metallurgy or sporadic experiments.*
- *Findings not yet peer-reviewed → academic caution.*

CONCEPT CHECK:

Q. Q1. Arrange the following cultural phases in chronological order (earliest → latest), based on current archaeological consensus:

1) Painted Grey Ware (PGW)
2) Megalithic burials in South India
3) Neolithic settlements of the Ganga valley
4) Northern Black Polished Ware (NBPW)

(a) 3 – 1 – 2 – 4
(b) 2 – 3 – 1 – 4
(c) 3 – 2 – 1 – 4
(d) 2 – 1 – 4 – 3

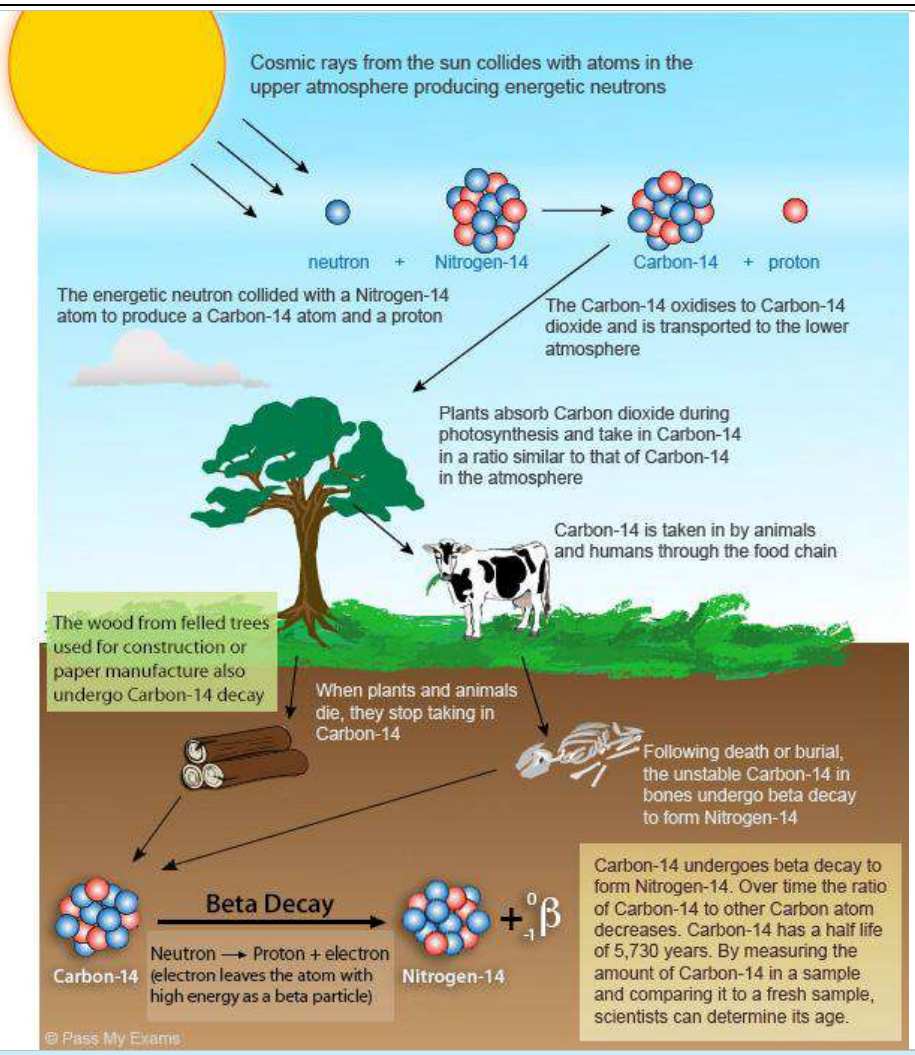
***Hint:** Recall the approximate timelines: Neolithic (~7000–2000 BCE), PGW (~1200–600 BCE), NBPW (~700–200 BCE), Megalithic (South ~1500–300 BCE).*

STATIC CONNECT:

Iron Age in India

- ***Period** → **~1200 BCE onwards** (earlier in South ~1500 BCE)*
- ***Key cultures** → **PGW** (1200–600 BCE), **NBPW** (700–200 BCE), **Megalithic** (South India)*
- ***Tools** → Iron ploughs, axes, sickles → ↑ agri + forest clearance*
- ***Weapons** → Swords, spears, arrowheads → ↑ warfare*
- ***Economy** → Surplus agri → urbanisation in Ganga valley*
- ***Sites** → Hastinapur, Ahichchhatra (PGW); Magadha (NBPW); Brahmagiri, Adichanallur (Megalithic)*
- ***Current Update** → Keezhadi finds → Iron use ~1500 BCE; Megalithic sites on UNESCO tentative list*

***Radiometric dating** → Technique to determine age of rocks/fossils → based on decay rate of radioactive isotopes (e.g. Uranium-238 → Lead-206, Carbon-14 → Nitrogen-14) → compares parent-daughter isotope ratio → gives absolute age (not relative).*



77. *Deciphering Indus Valley Script: Global meet & million-dollar incentive*

Why in News?

A global conference is being organised, and Tamil Nadu has announced a USD 1 million prize for decoding the Harappan script.

Deciphering the Indus Valley (Harappan) Script

Background & Significance

- *The Indus script is part of the undeciphered written corpus of the Indus Valley Civilization (c. 2600–1900 BCE).*

CONCEPT CHECK:

Q. Which one of the following is not regarded as a major obstacle in deciphering the Indus Valley (Harappan) script?

(a) Absence of a bilingual inscription akin to the Rosetta Stone

(b) Predominance of very short inscriptions

(c) Lack of any internal structure among sign-sequences

(d) Uncertainty about the underlying language(s)

Hint: *Even though semantics elude us, patterns (order, clustering) point to structure.*

 # Can AI finally read IVC writings?

- *Found on seals, pottery, tablets, tools, etc.*
- *No bilingual inscriptions (like a "Rosetta Stone") exist to cross-translate the signs.*
- *Most inscriptions are very short (average ~5 signs) — makes syntax/grammar reconstruction hard.*
- *Over 100 competing decipherment theories, none accepted universally.*

Key Theories & Methods

- ***Logo-syllabic hypothesis:*** *script may combine pictograms + phonetic signs.*
- ***Statistical / network analysis*** *suggests internal structure (syntax, sign ordering) even if semantics are unknown.*
- ***AI / machine learning approaches*** *are being explored to detect patterns and sign associations.*
- *A recent computational study finds visual similarity between Indus symbols and Tibetan-Yi corridor scripts (raises questions about cross-cultural transmission).*

78. *Rani Velu Nachiyar*

Why in News?

Mentioned as a historical personality in recent discussions on women freedom fighters.

Details

- *Title → "**Veeramangai"** (Brave Woman) of Tamil Nadu*
- *Period → 18th century (1730–1796)*
- *Region → Sivaganga, Tamil Nadu*
- ***First Indian queen to wage war against British** (1780s)*
- *Married to Muthu Vaduganatha Periyaudaiya Thevar (King of Sivaganga)*
- *After husband's death in battle (by British & Nawab of Arcot, 1772) → formed alliance with Hyder Ali (Mysore)*
- *Organized women army → **"Udaiyaal Army"** (named after a woman martyr who sacrificed life by blowing British arsenal)*
- *Used first recorded **suicide bombing tactic against British** (1780s)*
- *Restored to throne in 1780 with Hyder Ali's support → ruled till 1790*
- *Patron of Tamil, Sanskrit; promoted local culture & temple endowments*
- *Honored with a commemorative stamp (2008, India Post)*
- *Government of Tamil Nadu celebrates her birth anniversary (3 Jan)*

CONCEPT CHECK:

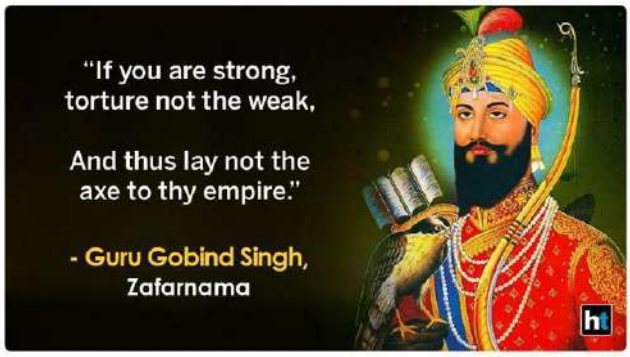
Q. Arrange the following events in the correct chronological order (earliest → latest):
A. Death of King Muthu Vaduganatha in battle
B. Rani Velu Nachiyar regaining the throne
C. Formation of the Udaiyaal Army
D. Issuance of a commemorative stamp by India Post
(a) A → C → B → D
(b) A → B → C → D
(c) C → A → B → D
(d) A → C → D → B

Hint: *The husband's death occurred first (1772), then she organized forces, then recaptured throne (~1780), and stamp came in 2008.*

79. *358th Birth Anniversary of Guru Gobind Singh*

Why in News?

*India observed 3-day **Prakash Utsav** marking the 358th birth anniversary of **Guru Gobind Singh Ji** (Jan 6, 2025)*



Guru Gobind Singh Ji — 358th Birth Anniversary

- *Guru Gobind Singh = **10th & last human Guru** of the Sikhs*
- *Born on 22 December 1666 (Julian) / observed as per Nanakshahi calendar → 6 January 2025*

CONCEPT CHECK:

Q. Guru Gobind Singh instituted the Khalsa Panth in 1699. Which of the following statements about this institution is CORRECT?
(a) Only males could be initiated into the Khalsa.
(b) Initiation into the Khalsa replaced the earlier practice of charan-pahul.
(c) After founding the Khalsa, Guru Gobind Singh

- *Succeeded his father **Guru Tegh Bahadur** at age 9*
- *Founded the **Khalsa Panth in 1699** (Vaisakhi) ✦ introduced the **Five Ks**: Kesh, Kangha, Kara, Kachera, Kirpan*
- *Declared **Guru Granth Sahib** as eternal Guru after him (i.e. no further human Gurus)*

appointed masands to collect offerings.
(d) The Khalsa was open only to Sikhs of Punjabi origin.

***Hint:** Think about reform of institutional practices in Sikhism under Gobind Singh.*

Guru	***Tenure***	***Key Contributions***	***Contemporaries (Rulers/Events)***
Guru Nanak Dev (1st)	*1469–1539*	*✦ Founder of Sikhism → "Ik Onkar"* *✦ Langar system* *✦ Udasis (missionary journeys)*	*Babur (Mughal founder)*
Guru Angad Dev (2nd)	*1539–1552*	*✦ Gurmukhi script standardised* *✦ Mal Akhara (physical training)*	*Humayun (Mughal)*
Guru Amar Das (3rd)	*1552–1574*	*✦ Langar compulsory* *✦ Manji system (missionary organisation)* *✦ Social reforms (widow remarriage, banned sati)*	*Akbar (Mughal, visited langar)*
Guru Ram Das (4th)	*1574–1581*	*✦ Founded Amritsar* *✦ Started excavation of Amrit Sarovar*	*Akbar*
Guru Arjan Dev (5th)	*1581–1606*	*✦ Compiled Adi Granth (1604)* *✦ Golden Temple construction* *✦ Martyred by Jahangir*	*Akbar, Jahangir*
Guru Hargobind (6th)	*1606–1644*	*✦ Concept of Miri-Piri (temporal + spiritual authority)* *✦ Akal Takht established (1609)* *✦ Armed Sikh militia*	*Jahangir, Shah Jahan*
Guru Har Rai (7th)	*1644–1661*	*✦ Maintained army but non-confrontational* *✦ Supported Dara Shikoh*	*Shah Jahan, Aurangzeb*
Guru Har Krishan (8th)	*1661–1664*	*✦ Child Guru (age 5–8)* *✦ Helped smallpox victims in Delhi*	*Aurangzeb*
Guru Tegh Bahadur (9th)	*1664–1675*	*✦ Martyred (beheaded in Delhi) → for defending Kashmiri Pandits' right to religion* *✦ Hymns in Guru Granth Sahib*	*Aurangzeb*
Guru Gobind Singh (10th)	*1675–1708*	*✦ Founded Khalsa Panth (1699, Baisakhi)* *✦ 5 Ks* *✦ Dasam Granth* *✦ Ended line of Gurus → Guru Granth Sahib as eternal Guru* *✦ Battles: Bhangani, Chamkaur, Muktsar*	*Aurangzeb, Bahadur Shah I*

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CURRENT EDGE SCHEDULE

Phase-I: Month-by-Month Mastery

Session	Date	Coverage	Material	Test (Q)
SESSION 1	1 Nov (Sat)	Jan + Feb 2025	Workbook 1	–
SESSION 2	8 Nov (Sat)	Mar + Apr 2025	Workbook 2	–
SESSION 3	15 Nov (Sat)	May 2025	Workbook 3	–
SESSION 4	22 Nov (Sat)	June 2025	Workbook 4	23 Nov (Sun) – Test 1 (50 MCQs)
SESSION 5	29 Nov (Sat)	July 2025	Workbook 5	–
SESSION 6	6 Dec (Sat)	Aug 2025	Workbook 6	–
SESSION 7	13 Dec (Sat)	Sep 2025	Workbook 7	14 Dec (Sun) – Test 2 (50 MCQs)
SESSION 8	20 Dec (Sat)	Oct 2025	Workbook 8	–
SESSION 9	27 Dec (Sat)	Nov 2025	Workbook 9	–
SESSION 10	3 Jan (Sat)	Dec 2025	Workbook 10	4 Jan (Sun) – Test 3 (50 MCQs)

Phase-II: Subject-wise CA Modules

Week	Date	Coverage	Material	Test (Q)
01	5–10 Jan	Polity – Part 1	Polity CA Part 1	–
02	12–17 Jan	Polity – Part 2	Polity CA Part 2	18 Jan (Sun) – Test 4 (50 MCQs)
03	19–24 Jan	Geo. & Env. Part 1	Geo-Env CA Part 1	–
04	27–31 Jan	Geo. & Env. Part 2	Geo-Env CA Part 2	1 Feb (Sun) – Test 5 (50 MCQs)
05	2–7 Feb	Eco. & Agr. Part-1	Eco-Agri CA Part 1	–
06	9–14 Feb	Eco. & Agr. Part-2	Eco-Agri CA Part 2	15 Feb (Sun) – Test 6 (50 MCQs)
07	16–21 Feb	Science & Tech	Sci-Tech CA	–
08	23–28 Feb	International Relations	IR CA	1 Mar (Sun) – Test 7 (50 MCQs)
09	2–7 Mar	History & Art–Culture	History CA	–
10	9–14 Mar	Government Schemes	Schemes CA	
11	16–21 Mar	Society & Social Issues	Society-Social Issues CA	–
12	23–28 Mar	Updation	CA Update	29 Mar (Sun) – Test 8 (50 MCQs)

Note: Session Date will be notify

Phase-III: CA Snippet Sessions

Date	Snippet Focus	Test (Q)
6 Apr (Mon)	Polity	–
8 Apr (Wed)	Geography	–
10 Apr (Fri)	Environment	12 Apr (Sun) – CA FLT 1 (100 MCQs)
13 Apr (Mon)	Economy	–
15 Apr (Wed)	Science & Tech	–
17 Apr (Fri)	International Relations	19 Apr (Sun) – CA FLT 2 (100 MCQs)
20 Apr (Mon)	History & Art–Culture	–
22 Apr (Wed)	Government Schemes	–
24 Apr (Fri)	Society & Social Issues	–

Complete CA Snippet File Launch Release in 1st Week of April 2026

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Other Details

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