

MAY., 2026

COMPLEMENTARY DIGITAL NOTES COVERED EVERY MONTH.



30 PAGER NOTES

MAY 2026 DECODED FOR
PRELIMS — WHERE
GOVERNANCE, ECONOMY,
SCIENCE, ENVIRONMENT, AND
MAPS CONVERGE INTO EXAM-
READY CLARITY.



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Table of Contents

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POLITY..... 3

ACTS & BILLS 4

CONSTITUTIONAL PROVISIONS & FEDERALISM 5

GOVERNANCE & JUDICIAL REFORMS..... 6

IMPORTANT JUDICIAL CASES MENTIONED 7

GOVERNMENT SCHEMES..... 8

ECONOMY 10

SUSTAINABLE DEVELOPMENT & ENERGY 11

ECONOMIC TRENDS & FISCAL POLICY 11

SECTORAL DEVELOPMENT & INFRASTRUCTURE..... 13

CROPS / AGRICULTURE COMMODITIES IN NEWS..... 14

IMPORTANT AGRICULTURAL THEMES 14

ENVIRONMENT 16

PROTECTED AREAS 17

ANIMAL SPECIES..... 17

LAWS AND POLICIES 18

TERMS..... 18

ORGANISATIONS..... 20

BILATERAL AGREEMENTS..... 22

SUMMITS AND OUTCOMES..... 23

REPORTS 25



| Click to Connect Now.



SCIENCE TECH..... 27

SPACE..... 28

DISEASES IN NEWS..... 28

VACCINES IN NEWS 30

DISCOVERIES AND INVENTIONS 30

DEFENCE TECH 32

MAPS..... 34

STRATEGIC WATERWAYS..... 34



POLITY

KEY TERMS	
Doctrine of Proportionality	A restriction on fundamental rights must be proportionate to the harm it seeks to prevent – a blanket ban challenged when a lighter alternative (e.g. licensing) exists. Core to Online Gaming Act challenge under Art. 19(1)(g).
Safe Harbour	Legal protection for online platforms from liability for user-generated content, conditional on good faith compliance with prescribed removal procedures. Platforms lose this if they resist government takedown orders.



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Actio Personalis Moritur Cum Persona	Latin legal principle: personal claims (pain, suffering, reputation) die with the person. Monetary/financial claims survive against legal heirs. Applied in SC ruling on medical negligence after doctor's death.
Floor Test	Constitutional mechanism to verify majority support in the Assembly. Governor cannot decide who has majority – must be tested on the floor of the legislature. Established in SR Bommai v Union of India (1994).
Vertical Devolution	Share of central tax revenues transferred to all states collectively (currently 41% of divisible pool under 16th Finance Commission). Horizontal devolution = how this 41% is distributed among individual states.
Notwithstanding Clause	A statutory provision that overrides all conflicting laws. FRA 2006's clause ("notwithstanding anything in any other law") means it supersedes even older SC interim orders restricting forest de-reservation.
Locus Standi	Legal standing to file a case in court. PIL (Public Interest Litigation) relaxed this – a third party can file on behalf of those who cannot approach courts themselves. SC reconsidering scope in May 2026.
Cognisable and Non-Bailable Offence	Police can arrest without warrant (cognisable); bail is not a right (non-bailable). Applied to serious violations under Online Gaming Act – repeat offenders face 3–5 years mandatory jail.

Acts & Bills

Bill / Act Name	Easy Explanation	Similar Examples / Related Laws
Online Gaming Act, 2025 + Rules 2026	Central law prohibiting ALL online money games – skill-based AND chance-based. Rules in force from 1 May 2026. OGAI (Online Gaming Authority of India) set up under MeitY. Section 12: graduated penalties. Repeat offenders: 3–5 years jail.	IT Act 2000 (S.69A: blocking); PMLA 2002 (money laundering); National Sports Governance Act 2025 (bars prohibited games from e-sports recognition); earlier Skill vs Chance doctrine – now abolished.





Bill / Act Name	Easy Explanation	Similar Examples / Related Laws
National Sports Governance Act, 2025	Regulates legitimate competitive sports; benchmarks e-sports recognition nationally. Explicitly bars prohibited online money games.	Online Gaming Act 2025; Sports Authority of India Act; Anti-Doping legislation.
ANRF Act (Anusandhan National Research Foundation)	Creates independent statutory body to fund and coordinate high-impact strategic research. Parent body for MAHA missions.	Science and Technology Act; DST mandates; SERB (Science and Engineering Research Board) – ANRF replaces/subsumes SERB.
RPWD Act, 2016 – SC expansion	SC expanded "acid attack victim" definition to include forced consumption of acid (not just visible external burns). Acid sellers can now be co-accused.	RPWD Act 2016 (replaces older PWD Act 1995); Sugamya Bharat Abhiyan (3 pillars: built environment, transport, ICT); Protection of Civil Rights Act.
Forest Rights Act, 2006 – Allahabad HC ruling	FRA 2006's "notwithstanding" clause overrides 2000 SC interim order restricting forest de-reservation. DLC cannot reject Tharu community claims citing old SC order.	Scheduled Tribes and Other Traditional Forest Dwellers Act 2006; PESA Act 1996; Environment Protection Act 1986 (forest diversion).
VB-GRAMG Act, 2025 (replaces MGNREGA)	Viksit Bharat-Guarantee for Rozgar and Ajeevika Mission Gramin replaces MGNREGA from 1 July 2026. Funding via 16th Finance Commission formula. DBT-only payments.	MGNREGA 2005; Code on Social Security 2020; Mahatma Gandhi National Rural Employment Guarantee Scheme; Direct Benefit Transfer framework.
Trade Unions Act, 1926 – centenary	First law giving legal recognition to trade unions in India. Protected workers from criminal conspiracy charges. 2026 marks 100 years.	Industrial Relations Code 2020 (51% worker support required for recognition); Code on Social Security 2020; Article 19(1)(c): right to form associations.
BNS 2023 + Sedition	IPC Section 124A (sedition) dropped under Bharatiya Nyaya Sanhita 2023. BNS uses "acts endangering sovereignty" instead. SC allowed ongoing sedition trials to continue only if accused CONSENTS.	IPC 1860 (repealed); BNS 2023; Kedar Nath Singh v State of Bihar (1962): narrow sedition interpretation; Shreya Singhal v Uol (2015): free speech limits.

Constitutional Provisions & Federalism

Constitutional Provision / Amendment	Easy Explanation	Similar Examples / Why It Matters
Seventh Schedule – Online gaming (State vs Union List)	State List Entry 34: physical betting/gambling → state subjects. Union List: inter-state commerce,	Article 246 defines legislative boundary. Similar federal tension: GST (concurrent



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Constitutional Provision / Amendment	Easy Explanation	Similar Examples / Why It Matters
	telecom, IT → Centre justified central gaming regulation by invoking Union List. States challenged on federalism grounds.	list), broadcasting regulation, UAPA (states wanted more say).
Article 19(1)(g) and Doctrine of Proportionality	Right to trade/profession. Blanket ban on skill-based games argued disproportionate – licensing model sufficient. Article 19(6): reasonable restrictions permissible.	Article 19(1)(a) (speech); Article 19(6) (reasonable restriction); Maneka Gandhi v Uol; Modern Dental College v State of MP (proportionality in professional courses).
Article 21 – surveillance and privacy angle	Gaming law permits digital tracking and data retention. Must satisfy Puttaswamy (2017) privacy test. "Just, fair, and reasonable" procedure required.	Puttaswamy v Uol (2017) – right to privacy; Aadhaar judgment; DPDP Act 2023.
Article 164 – Governor and CM in hung Assembly	In hung Assembly, Governor has discretionary power to invite CM. TN 2026: Governor Rajendra Arlekar asked TVK leader C. Joseph Vijay to prove 118/234 MLA support before swearing-in. Cannot arbitrarily remove sitting CM with majority.	SR Bommai v Uol (1994) – floor test is the test; Sarkaria Commission; Punchhi Commission on Governor's role.
Tenth Schedule Para 4 – Merger and Rajya Sabha defections	Para 4: merger requires 2/3 legislators AND the original party itself must merge. 2/3 alone is NOT sufficient. Para 3 (split) abolished by 91st Amendment 2003.	Rajendra Singh Rana v Swami Prasad Maurya (2007); 52nd Amendment 1985 (introduced anti-defection); 91st Amendment 2003 (abolished Para 3).
Model Code of Conduct (MCC) – PM broadcast	MCC = ECI guideline, NOT a law. Prohibits Doordarshan, AIR, Sansad TV for partisan use. RPA 1951 Section 123(7): using government machinery = corrupt practice. Art. 324: ECI authority.	Common Cause v Uol; RPA 1951; Article 19 (political speech rights vs electoral integrity).
16th Finance Commission – devolution	41% vertical devolution retained. Cesses/surcharges (>15% of gross tax) NOT in divisible pool. Equity vs efficiency: southern states' shares declining; northern/central states gaining.	14th FC (42%), 15th FC (41%). Article 280: Finance Commission. Article 275: grants. Kerala and TN challenging share reduction.

Governance & Judicial Reforms



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Reform / Issue	Easy Explanation	Similar Examples / Related Concepts
EVMs – journey from polling to counting	Randomised allocation with party reps present. Strong room = single entry, double lock, CCTV, armed guard. Postal ballots stored separately. Counting under videography. District Election Officer = custodian.	e-EPIC (electronic voting identity); VVPATs (paper trails); ECI guidelines on model code enforcement.
AI-enabled electoral roll monitoring	Continuous AI surveillance of voter rolls to detect fake, duplicate, ghost voters. Raises concern: may also exclude genuine voters from marginalised communities.	Special Summary Revision (SSR) of electoral rolls; NRC debates; Article 326 (universal adult franchise); "fake voter" vs "excluded citizen" balance.
Sahyog Portal + IT Rules	Faster government content removal requests to social media platforms. Platforms lose safe harbour if they resist. Bypasses Shreya Singhal v UoI (2015) requirement for court orders.	Section 69A IT Act (blocking); Shreya Singhal v UoI (2015); Information Technology (Intermediary Guidelines) Rules 2021.
Karnataka Gig Workers Grievance System	India's first government-backed complaint mechanism for platform workers. IDRC resolves in 15 working days (max 45). Appeal to Gig Workers Welfare Board within 30 days.	Rajasthan Gig Workers Welfare Act; Code on Social Security 2020 (Chapter IX – gig workers); e-Shram portal.
Digital Census 2027	First digital census with self-enumeration online. Includes caste data (last done 1931). Last census 2011 – 16-year gap. NPR linked.	Census Act 1948; Article 246 (census = Union List); Seshan Committee; OBC data and Mandal Commission legacy.
NEET-UG shift to CBT	K. Radhakrishnan committee post-2024 paper leak. >22 lakh students. Multi-shift CBT needs normalisation (percentile method, like JEE Main). Challenge: rural digital infrastructure.	NTA reforms; JEE Main as CBT precedent; Article 14 (equal opportunity); Education under Concurrent List.
Jharkhand IFMS treasury scam	~₹50 crore siphoned via IFMS (Integrated Financial Management System) ghost accounts of dead/retired employees. Kuber portal misused. CAG had warned of weak IT controls. 14 districts affected.	Fodder Scam precedent; CAG (Article 148); Article 266 (Consolidated Fund of India); PFMS (Public Financial Management System).
OBC quota in UP panchayat polls	SC mandated triple test before restoring OBC quota: (1) dedicated commission study; (2) data on existing reservation; (3) total reservation ≤ 50%.	K. Krishna Murthy v UoI (2010) – triple test; Article 243D (SC/ST reservation in panchayats); 73rd Amendment.

Important Judicial Cases Mentioned



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Case	Why Important
SR Bommai v Union of India (1994)	Floor test = only way to verify majority. Governor cannot decide on the floor – must be tested in the House. Restricted misuse of Article 356 (President's Rule).
Rajendra Singh Rana v Swami Prasad Maurya (2007)	2/3 of party legislators alone cannot constitute a valid merger under Tenth Schedule. The original political party must itself merge for Para 4 protection to apply.
Puttaswamy v Union of India (2017)	Right to privacy is a fundamental right under Article 21. Any restriction must be just, fair, and reasonable. Applied in Online Gaming Act surveillance challenges.
Shreya Singhal v Union of India (2015)	Content removal from online platforms must be based on court orders or direct legal authority – government cannot unilaterally demand removal. Sahyog Portal challenges this framework.
SC on brain death certification (2026)	SC examining whether EEG and angiogram should be mandatory for brain death certification. Currently: 4-doctor board, 2 tests 12 hrs apart, clinical tests only. India organ donation rate ~0.77/million.
SC on medical negligence after doctor's death (2026)	Financial/monetary claims continue against deceased doctor's legal heirs. Actio personalis moritur cum persona applies only to personal, non-monetary claims.
SC on abortion for minor rape victims (POCSO vs MTP tension)	SC 2022: reproductive decisional autonomy = fundamental right under Art. 21. Minors can access MTP without public identity disclosure. POCSO mandatory FIR requirement still chills doctors.
SC on stray dogs	Art. 21 (human right to safety) vs Art. 51A(g) (duty to protect animals). Animal Birth Control Rules 2023. Local bodies responsible for population management through sterilisation.
SC on OBC quota in panchayat polls	Triple test mandatory before restoring OBC quota in local body elections. K. Krishna Murthy v Uoi (2010) framework must be followed.
Madras HC on TVK MLA + Assembly floor test	HC barred TVK MLA from participating in floor test pending legal challenge. Raises separation of powers question: can courts intervene in legislative proceedings?

Government Schemes



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Name of Scheme / Programme	What It Does	Ministry / Department
MAHA Programme (5 missions under ANRF)	Parent umbrella for 5 strategic research missions: EV, Drones, Medical Tech, 6G, Water. Solution-driven, not basic research. Up to ₹20 cr per project.	ANRF (independent statutory body – not under a single ministry)
ANRF–Jal Shakti MAHA Water Mission	5-year joint mission for water conservation technology development and field testing. ₹200 crore total outlay.	ANRF + Ministry of Jal Shakti
Jal Sanchay Jan Bhagidari (JSJB)	National citizen mobilisation campaign for water conservation. Digital portal + app for real-time community reporting. NOT an infrastructure funding scheme.	Ministry of Jal Shakti
VB-GRAMG (replaces MGNREGA from 1 July 2026)	Rural employment guarantee scheme. DBT-only payments. Performance-based fund release. 16th Finance Commission formula for state allocation. States bear excess spending.	Ministry of Rural Development
India Semiconductor Mission (ISM)	Build full semiconductor ecosystem: fabrication + packaging (OSAT) + design. 12 plants approved by May 2026. First display fab added.	Ministry of Electronics and IT (MeitY)
Women-Friendly Gram Panchayat initiative	Localises SDGs (especially gender equality) at panchayat level. 1.4 million women elected reps in Panchayati Raj system. UNFPA partnership.	Ministry of Panchayati Raj + UNFPA
Ayushman Bharat PMJAY	Health insurance scheme expanded to cover more beneficiaries. 3x increase in coverage since 2018 (NSO survey). Hospitalisation rates still below pre-expansion levels.	Ministry of Health and Family Welfare
e-Courts Mission Mode Project	Digitisation of courts: e-filing, virtual hearings, digital case management. AI-based electoral roll monitoring linked to same digital governance push.	Department of Justice, Ministry of Law



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ECONOMY

KEY TERMS	
Backwardation	Oil market condition where spot (immediate delivery) price exceeds futures (future delivery) price – signals short-term supply scarcity. During Hormuz disruption, physical oil prices spiked far above the Brent benchmark.
Asian Premium	The structural price premium Asian buyers pay for crude oil compared to European/American buyers for the same grade – due to weaker collective bargaining and geographic dependence on Gulf sources.
Peak Oil	The theory that global oil demand will reach a maximum and then permanently decline as the energy transition scales. UAE exited OPEC to sell maximum oil BEFORE this peak occurs.
CBAM (Carbon Border Adjustment Mechanism)	EU policy charging importers a carbon fee based on the emissions intensity of their production process. Prevents "carbon leakage." Revenue flows to EU – not the exporting country. Full payments begin 2026.
IBAM (India Border Adjustment Mechanism)	India's proposed response to CBAM: charge its own carbon fee on exports before they reach the EU → EU recognises it → reduces CBAM liability. Revenue stays in India. NOT yet enacted.
Network Slicing	A 5G feature that divides one physical network into multiple virtual networks, each optimised for specific uses. Airtel's priority tier uses this – debate: does it violate net neutrality?
Credit Card Devaluation	Systematic reduction of credit card reward programmes (cashback, points, lounge access) by banks – driven by RBI capital requirements for unsecured lending, rising reward costs, and more customers paying full bills.
Inflation vs Affordability	Inflation = rate of price INCREASE (speed). Affordability = whether income covers ACCUMULATED prices (burden). Falling inflation does NOT mean prices fall – they still rise, just more slowly. Prices rarely return to earlier levels.
Overdiagnosis	When medical tests detect conditions that would never have harmed the patient – causing unnecessary treatment, anxiety,



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and cost. Core concern with whole-body scan packages marketed to healthy people.

Sustainable Development & Energy

Topic	Easy Explanation	Relevance / Example
National Green Hydrogen Mission	India's mission to produce and export green hydrogen at scale. Targets ~50 MMT annual GHG abatement by 2030.	Green hydrogen = ELECTROLYSIS of water using RENEWABLE electricity. Grey = natural gas without CCS. Blue = natural gas with CCS. Only green hydrogen is zero-emission.
Industrial Heat Pumps	Transfer and upgrade existing heat using electricity instead of burning fossil fuels. Produce 3–5 units of heat per 1 unit electricity.	Useful for low-to-medium temperature industries: textiles, food processing, chemicals, pharma, paper. Can reduce energy use 40-60% in suitable cases. Barriers: cheap electricity + MSME financing.
Decentralised Bioenergy Systems	Village-level biogas/biomass plants using agricultural waste for local energy generation.	Reduces LPG and fossil fuel dependence in rural areas. Bioenergy ≠ green hydrogen: different technology (organic combustion vs electrolysis of water).
Ethanol Blending – India's progression	E20 (20% ethanol) mandatory from 2026. E85/E100 proposed – requires flex-fuel vehicles. Sources: sugarcane, maize, rice.	Rice-based ethanol = water-intensive (less sustainable). Sugarcane = primary current source. Ethanol currently cheaper than petrol – cost + energy security driver.
Delhi EV Policy 2.0	Phase out new ICE three-wheelers from Jan 2027; ICE two-wheelers from April 2027. Moves beyond subsidies to regulatory certainty.	CAFE-3 (Corporate Average Fuel Efficiency norms) revised: pressure on manufacturers + credit pooling. Trucks = 3% of vehicles but ~44% of transport emissions (least regulated segment).
India's green transition running on coal	Despite renewable expansion, coal still dominates India's electricity generation. Transition is long-term structural shift.	Renewable intermittency (solar falls at night) forces continued coal baseload dependence. Energy storage systems needed. Grid balancing challenge for India.
SMILE Mission (Solar wind Magnetosphere Ionosphere Link Explorer)	First joint China-ESA space mission. Will capture first X-ray images of Earth's magnetosphere interacting with solar particles.	Magnetosphere = Earth's protective magnetic shield against solar wind. Solar storms can damage satellites, GPS, power grids. Auroras = solar particles interacting with magnetic field near poles.

Economic Trends & Fiscal Policy



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Topic	Easy Explanation	Relevance / Example
State debt burden – four poll states 2026	West Bengal: highest fiscal deficit (exceeds 3% GSDP limit) + highest unemployment. Kerala + TN: revenue deficit (borrowing for daily expenses). Assam: fastest growing but smallest base.	Freebies funded by borrowing → rising interest burden → crowding out development spending. Welfare vs fiscal prudence debate: how much can states borrow before debt becomes unsustainable?
16th Finance Commission – equity vs efficiency	41% vertical devolution retained. Cesses/surcharges not shared. Equity: poorer states get more. Efficiency: better-performing states argue they are penalised.	Southern states (TN, Karnataka, Kerala) share declining over successive FCs. Large north/central states (UP, Bihar, MP) gaining share. States demanding 50% devolution – Centre resisting.
Capital flight and rupee pressure	FII outflows + current account deficit + weak exports → rupee depreciates. India imports 85% crude oil – dollar demand is structural.	RBI managed float: intervenes to prevent sharp falls but does not fix rate. Structural fix requires export boost + domestic manufacturing growth + reduced oil import dependence.
India's import bill warning signs	Rising crude prices (Hormuz disruption) + weak rupee = double pressure. Fertiliser imports also rising due to West Asia tensions.	India imports 85% crude oil + ~80-90% potash and significant phosphate. Any disruption = widening trade deficit → CAD pressure → rupee falls further (vicious cycle).
US Green Card rules tightening – Indians affected	New rules make Adjustment of Status (applying inside US) harder. Applicants may need to return to home country for consular processing.	Indians dominate EB-2, EB-3 employment-based queues. Some Indians already wait 20+ years. H-1B, F-1, H-4 visa holders most affected. Remittances to India may slow if migration becomes harder.
Byju's collapse	Byju Raveendran jailed 2026 on fraud charges. BYJU'S (Think & Learn Pvt Ltd) = India's largest edtech bankruptcy. NCLT proceedings. BCCI payment default was high-profile early signal.	Corporate governance failure: rapid growth without financial discipline. NCLT = National Company Law Tribunal. Illustrates: edtech boom was partially valuation bubble, not sustainable business model.
India-US interests diverging	Operation Sindoor: US urged restraint instead of backing India fully. Trump announced ceasefire before India did. Trade: US tariff pressure. Tech: US chip export controls affect India's semiconductor plans.	Five principles for India's diplomacy: strategic autonomy, multi-alignment, equity in global governance, technology access, climate justice. India must play cards confidently rather than deferentially.





Sectoral Development & Infrastructure

Topic	Easy Explanation	Relevance / Example
Jammu-Srinagar Vande Bharat	Direct semi-high-speed train: Jammu Tawi → Katra → Reasi → Banihal → Srinagar. 266 km, under 5 hours, 6 days/week.	Chenab Rail Bridge: 359 m above river = world's highest railway bridge. Reduces dependence on landslide-prone NH-44. Strategic: defence logistics + horticulture movement (apples, dry fruits). Anji Khad Bridge also on route.
Kerala Silver Line (K-Rail) – scrapped	Semi-high-speed rail: Kasaragod → Thiruvananthapuram. Scrapped by Kerala state government (not Centre) in 2026.	Estimated cost: ~₹64,000 crore. Scrapped by STATE government after public opposition. Concerns: land acquisition (paddy fields, wetlands), financial viability given Kerala's fiscal stress.
India Semiconductor Mission (ISM) – 12 plants	12 plants approved by May 2026 under ISM. New: India's first display fab (LCD/OLED screens).	ISM launched 2021; ₹76,000 crore. Plants: CG Power (Gujarat), Tata OSAT (Assam), HCL-Foxconn JV (MP), SiCSem-SiC chips (Odisha). ASML (Netherlands) = world's only EUV machine maker.
India-Netherlands semiconductor partnership	PM Modi Netherlands visit focused on chip ecosystem cooperation. ASML = world's only EUV (Extreme Ultraviolet) lithography machine maker.	Dholera (Gujarat) = proposed Tata advanced fab. EUV machines essential for advanced chips. US export controls on chips to China → India as alternative manufacturing hub under China+1 strategy.
Critical National Infrastructure (CNI)	Systems whose disruption would severely impact national functioning: electricity, water, fuel, banking, transport, internet, healthcare, defence.	Digital transformation increased both efficiency AND vulnerability. IoT-connected industrial systems = new attack surface. Supply chain security (imported components with hidden vulnerabilities) = emerging concern.
UP Prepaid Smart Meters – rollback	UP had mandated prepaid smart electricity meters. Centre clarified NOT mandatory. CEA removed "prepayment mode" from rules.	Union Power Minister Manohar Lal Khattar: not mandatory. CEA = Central Electricity Authority. Prepaid meters = pay-in-advance for electricity (like prepaid mobile recharge).
India ageing challenge – Kerala leads	Kerala first state with a dedicated elderly welfare department. Kerala: 16.5% above 60 in 2021 vs national avg 10.1%.	Kerala fertility rate: 1.35 (below replacement level 2.1). Care economy opportunity: jobs in caregiving, health services. By 2050: elderly = 20.8% of India's population (~34.7 crore).
Odisha Marine Fishing Regulation Bill, 2026	Replaces 44-year-old 1982 Act. Promotes: deep-sea fishing, mariculture,	Linked to Odisha's Blue Economy strategy + Deep Sea Fishing Mission. Biometric ID for fishermen.





Topic	Easy Explanation	Relevance / Example
	seaweed farming, marine cage culture, artificial reefs.	Technology-based coastal surveillance. Targets higher seafood exports by 2036.

Crops / Agriculture Commodities in News

Crop / Commodity	Why in News	Key Insight	UPSC Relevance
Sugarcane / Sugar	India banned sugar exports till September 2026 despite current surplus.	Fear of El Niño-driven weak monsoon + West Asia conflict disrupting fertiliser supply. Sugarcane = water-intensive and fertiliser-intensive crop.	Food vs fuel debate; sugar export policy; El Niño and monsoon; fertiliser import dependence.
Millets (esp. Bajra/Pearl Millet)	Farmers may shift from cotton, paddy, maize to millets due to Iran war + fertiliser uncertainty + El Niño risk.	Millets: less water, fewer fertilisers, shorter crop cycle, climate-resilient. Allow additional crops post-harvest. Government push continues post-International Year of Millets 2023.	Climate-resilient agriculture; food security; crop diversification; millet promotion policy.
Maize (Corn)	Ethanol blending target (E20) increasing demand for maize as feedstock.	Preferred over rice for ethanol: less water-intensive. Also used for poultry feed. Dual demand (ethanol + feed) = potential price pressure.	Food vs fuel debate; ethanol blending policy; agricultural diversification.
Fertilisers (DAP, Urea, Potash)	West Asia conflict (Iran + Hormuz) may disrupt global fertiliser supply chains.	India imports ~80-90% of potash and large share of phosphate. Urea depends on natural gas. Any disruption = higher input costs → lower farm margins → possible shift to low-input crops.	Fertiliser subsidy burden; import dependence; food security; agricultural policy.

Important Agricultural Themes



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Concept	Easy Meaning	Examples
El Niño threat to kharif 2026	Warming of central/eastern Pacific Ocean → weakens Indian Southwest Monsoon → drought and crop failure risk for June–September kharif season.	Sugarcane, cotton, paddy most vulnerable. Government banning sugar exports as precaution. Millets emerging as climate-resilient alternative for uncertain rainfall regions.
Fertiliser disruption via Hormuz	West Asia conflict + Strait of Hormuz tensions → disruption of shipping routes → higher fertiliser import costs for India.	India imports ~80-90% potash; significant phosphate. Urea needs natural gas (import dependent). Higher input costs → higher food prices → inflation risk.
Food vs Fuel debate	Crops diverted for biofuel production (ethanol, biodiesel) instead of food supply – creates competition between two uses of the same crop.	Sugarcane for ethanol vs sugar for food. Maize for ethanol vs poultry feed. E20 mandate increasing this tension. Edible oil diversion for biodiesel globally raises cooking oil prices.
Blue Economy and marine fisheries	Sustainable economic use of ocean resources: fisheries, aquaculture, shipping, marine energy. India's EEZ = 2.37 million sq km.	Odisha Marine Fishing Bill 2026 linked to Blue Economy strategy. Deep-sea fishing + mariculture + seaweed farming = future growth areas. Overfishing and illegal foreign vessels = challenges.
Care economy – ageing India	Economic sector involving caregiving, eldercare, childcare – largely performed by women as unpaid labour. Growing as India's population ages.	Kerala: 16.5% above 60. Care economy creates formal employment in geriatric services, nursing, assisted living. Women's unpaid care work = significant economic contribution currently unmeasured in GDP.





ENVIRONMENT

KEY TERMS	
PHEIC (Public Health Emergency of International Concern)	WHO's highest alert level. Declared when an event is serious, sudden, unusual, or unexpected with international spread risk requiring coordinated response. Triggers international obligations. Declared for Bundibugyo Ebola in May 2026.
Ecocide	Severe, widespread, or long-term destruction of ecosystems. Proposed as 5th international crime under the ICC Rome Statute. NOT yet enacted – currently only environmental destruction linked to direct human harm is punishable under Rome Statute.
AMOC (Atlantic Meridional Overturning Circulation)	The "global ocean conveyor belt" in the Atlantic. Warm surface water moves north, cools, sinks, returns south as deep cold water. Weakening reduces heat/moisture transport – weakens Indian monsoon through reduced Arabian Sea winds.
Surface Reconstruction	Rearrangement of outermost atoms on a metal surface into a different, more stable configuration (hexagonally packed structure on gold). Prevents oxygen molecules from bonding → explains why gold does not rust or tarnish.
Plan Vivo	Voluntary certification standard for community-based REDD+ (Reducing Emissions from Deforestation and forest Degradation) projects. Verifies carbon storage claims and community benefit distribution. India's first certified project: Khasi Hills Community REDD+ (Meghalaya).
BSL-4 (Biosafety Level 4)	Highest containment level for research on lethal, airborne pathogens with no known cure or vaccine. Required for Bundibugyo Ebola research. ~100 BSL-4 labs globally; only 2 in India.
Blue Transformation (FAO)	FAO's framework for transforming ocean-based food and agriculture systems. Four Betters: Better production, Better nutrition, Better environment, Better LIFE (not "better ocean" or "better coral reefs" – common wrong answer).
Invasive Species – ecological nuance	Non-native species that establish and spread in new ecosystems. Key 2026 insight: in ALREADY DEGRADED



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habitats, some invasive species perform ecological functions (soil stabilisation, carbon storage). Removal alone does not restore ecosystems if root causes remain.

Protected Areas

Protected Area / Region	Location	Key Details	Famous For
Great Nicobar Island	Andaman & Nicobar Islands, India (southernmost island)	UNESCO Biosphere Reserve 2013. ₹72,000 cr mega-project (port + airport + township) proposed. ~ 1 million trees to be felled. 2004 tsunami: land sank 3-4 m. NGT approved – critics say ecological scrutiny inadequate.	Part of Sundaland Biodiversity Hotspot. Shompen (PVTG) + Nicobarese tribes. Largest leatherback sea turtle nesting population globally. Near Strait of Malacca.
Saranda Forest	Jharkhand (Singhbhum district)	SC directed Jharkhand to protect Saranda forest rights. Conflict: iron ore mining vs forest and tribal rights. FRA 2006 Gram Sabha rights must be respected.	Largest sal forest in Asia. Home to Ho, Munda, Birhor communities. Iron ore-rich region. Classic development vs conservation + tribal rights conflict.

Animal Species

Species	Type	Key Details	IUCN Status
Pangolin (Indian + Chinese)	Mammal	Most trafficked mammal globally. DNA maps now identify trafficking hubs. India = source AND transit country. Scales = keratin (same as human nails). Roll-up = only defence. 8 species globally (4 Asia, 4 Africa).	Indian Pangolin: Endangered. Chinese Pangolin: Critically Endangered.
Invasive plants (Prosopis juliflora, Lantana camara, Senna spectabilis)	Non-native invasive plants	Prosopis introduced 19th century; spread accelerated post-Green Revolution water system disruption. In degraded habitats: perform some ecological functions (soil stabilisation, carbon). Removal alone ≠ restoration.	Not IUCN threatened – they ARE the threat to native biodiversity.
Sperm Whale	Marine mammal (largest toothed predator)	Communicate via "codas" (click sequences). New finding: clicks differ in ACOUSTIC QUALITY – two types ("a" and "i" types, like vowel sounds). Far more complex than Morse code.	Vulnerable (IUCN). Endangered in some regions.



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Laws and Policies

Law / Policy	Key Points	Main Objective
Forest Rights Act, 2006 – Allahabad HC ruling	Notwithstanding clause: FRA 2006 supersedes 2000 SC interim order. DLC cannot reject Tharu community claims on basis of old order. Gram Sabha's power to protect forest rights is primary.	Recognise and vest forest rights of Scheduled Tribes and other traditional forest dwellers. Correct historical injustice of exclusion from forest land and resources.
Ecocide – proposed international law	NOT yet an international crime. Proposed for ICC Rome Statute. Term coined by Arthur Galston (Yale, 1970) re US Agent Orange in Vietnam. Rome Statute: currently only environmental destruction linked to direct human harm is punishable.	Make large-scale environmental destruction a crime under international law. Force accountability for industrial and military environmental devastation.
CBAM – EU Climate Border Policy	Transitional phase (reporting only): 2023–2025. Full payments from 2026. Products: steel, cement, aluminium, fertilisers, hydrogen. EU companies still receive free allowances – unequal burden.	Prevent "carbon leakage" – companies moving production to countries with weaker climate rules. India proposes IBAM as domestic response to retain carbon revenue.
Kerala Oil Spill Contingency Plan (OSCP)	India's Coast Guard = primary national marine oil pollution response agency. OSCP: emergency response + environmental protection + clean-up system. West coast high-risk (Arabian Sea + Hormuz proximity).	Protect marine ecosystems and coastal livelihoods from oil spill damage. Compliance with IMO (International Maritime Organization) conventions.
NGT approval of Great Nicobar project	NGT approved the ₹72,000 cr project citing strategic importance. Critics: "strategic importance" label used to bypass adequate ecological scrutiny. Precedent concern.	Balance environmental protection with national strategic and development goals. NGT (National Green Tribunal Act 2010) mandates ecological scrutiny of major projects.

Terms

Term	Meaning	Context / Where Used	Key Points
AMOC	Atlantic Meridional Overturning Circulation – global ocean conveyor belt current.	Potential collapse of key ocean current – consequences for India and world (May 2026 article).	Could weaken 59% by 2100 (new study). Arctic ice melt dilutes N. Atlantic → AMOC slows. Effect on India: weakens Arabian Sea winds → weaker monsoon.



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Term	Meaning	Context / Where Used	Key Points
LT-LEDS	Long-Term Low Emission Development Strategy – India's net-zero roadmap by 2070.	India's climate commitments context.	Strategy document – NOT legally binding. NDCs are binding. BUR-4 (December 2024): ~8% GHG decrease in 2020 vs 2019 = COVID dip, not structural trend.
Urban Heat Island (UHI)	Cities hotter than surrounding rural areas due to concrete/asphalt absorbing + releasing heat.	Rising night-time heat as urgent health hazard (May 2026 articles).	NIGHTTIME temperatures rising faster than daytime maxima. Most vulnerable: elderly, outdoor workers, slum dwellers. AC use rises → electricity demand peaks at night.
Wastewater Surveillance	Testing sewage for virus particles to track community disease prevalence.	Wastewater surveillance revealed hidden COVID surges in Bengaluru.	Bengaluru study tracked 4 COVID surges (BA.2, XBB, JN.1, 2021–2024). Does NOT give early warning – concurrent with rising infections. Complementary, not replacement for clinical testing.
Blue Economy	Sustainable economic use of ocean resources: fisheries, aquaculture, shipping, marine energy.	Odisha Marine Fishing Regulation Bill 2026.	India's EEZ = 2.37 million sq km. Deep-sea fishing + mariculture + seaweed farming = growth areas. Challenges: overfishing, illegal foreign vessels, climate impact on fish stocks.
Plan Vivo	Voluntary certification standard for community-based REDD+ carbon projects.	India's REDD+ programme context.	India's first Plan Vivo certified REDD+ project: Khasi Hills Community REDD+, Meghalaya. Common wrong answers: Uttarakhand or Sikkim.
Surface Reconstruction (gold)	Rearrangement of outermost metal atoms into stable hexagonal patterns – lowers surface energy.	Why gold never rusts (new 2026 study).	Gold surface atoms rearrange (Au(100) and Au(110) surfaces) → O ₂ molecules cannot split and bond → no oxidation. May help design better industrial gold catalysts.
Overdiagnosis	Detection of conditions that would never have harmed the patient – leading to unnecessary treatment.	Whole body scans: why investors love them but doctors hate them.	South Korea thyroid cancer screening surge – diagnoses exploded, death rates unchanged. Evidence-based screening: specific disease + high-risk group only (e.g. lung cancer screening for heavy smokers).





ORGANISATIONS

KEY TERMS	
EFTA (European Free Trade Association)	Norway, Switzerland, Iceland, Liechtenstein. NOT EU members. Have independent trade agreements. India's TEPA with EFTA commits ~\$100 bn investment over 15 years.
FOCAC (Forum on China-Africa Cooperation)	China's flagship multilateral engagement platform with Africa. Competes with India's IAFS, EU-AU Summit, Japan-Africa, South Korea-Africa summits for African diplomatic engagement.
OPEC+	OPEC (12 oil exporters) plus Russia and others who coordinate production levels. UAE exited OPEC proper in 2026 – weakens collective production control. India is a major oil importer heavily affected by OPEC+ decisions.
AUC (African Union Commission)	Executive body of the African Union – acts like secretariat + commission combined. Key institutional partner for India's IAFS IV engagement.
NIFPHATT	National Institute of Fisheries Post Harvest Technology and Training, Kerala. Established through India-Norway fisheries cooperation in the 1950s – one of India's earliest bilateral technical cooperation programmes post-Independence.
CEPI (Coalition for Epidemic Preparedness Innovations)	International body that funds vaccine development for epidemic threats. Supporting Bundibugyo Ebola vaccine development. Also funded COVID-19 vaccine development. Co-funded by Bill & Melinda Gates Foundation + Wellcome Trust + governments.

Organisation	Formed (Why)	Members	Observers	Why in News (May 2026)	India's Role
OGAI (Online Gaming Authority of India)	2026; created under Online Gaming Act 2025 to regulate digital gaming	Attached body under MeitY; not a membership body	–	Became operational 1 May 2026. Registers gaming platforms; enforces ban on money games; issues notices to non-compliant platforms.	India's central gaming regulator – entirely domestic body.



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Organisation	Formed (Why)	Members	Observers	Why in News (May 2026)	India's Role
ANRF (Anusandhan National Research Foundation)	2023; created to fund and coordinate strategic national research and replace fragmented funding	Independent statutory body; not under single ministry	–	Launched MAHA Water Mission with Jal Shakti Ministry. MAHA Programme (5 missions) operational.	India's national research backbone; subsumes SERB; funds up to ₹20 cr per project.
OPEC (Organisation of the Petroleum Exporting Countries)	1960; coordinate oil production and stabilise petroleum markets	12 oil-exporting countries (after UAE exit)	Cooperates with non-members via OPEC+	UAE (Abu Dhabi) exit debated heavily – weakens cohesion; crude price implications; Saudi Arabia losing leverage.	India = major oil importer; affected by OPEC+ production decisions. Not a member.
EFTA (European Free Trade Association)	1960; alternative to EU for European trade cooperation	Norway, Switzerland, Iceland, Liechtenstein	–	EFTA-India TEPA finalised – ~\$100 bn investment commitment over 15 years. PM Modi Oslo visit (first Indian PM in 40+ years).	India = emerging trade partner of EFTA. New FTA partner (alongside NZ FTA, fastest completed).
AUC (African Union Commission)	2002 (AU replaced OAU); AUC = executive secretariat	55 African Union member states	–	IAFS IV (India-Africa Forum Summit IV) held May 28-31, 2026. Fourth summit, delayed from 2020 (COVID).	India uses IAFS as platform for development cooperation, UPI exports, pharma, and digital tools.
CEPI (Coalition for Epidemic Preparedness Innovations)	2017; created after West Africa Ebola epidemic to fund vaccines for epidemic threats	Governments + Gates Foundation + Wellcome Trust	–	Supporting Bundibugyo Ebola (BDBV) vaccine development after WHO PHEIC declaration.	India is a CEPI partner country. Serum Institute of India = major CEPI grantee for COVID vaccines.





Organisation	Formed (Why)	Members	Observers	Why in News (May 2026)	India's Role
WTO (World Trade Organisation)	1995; regulate global trade and replace GATT	164 members	Observer governments	Tariffs to carbon: new rules shaping India's trade – CBAM, digital trade, subsidy disciplines.	India advocates SDT (Special and Differential Treatment) for developing countries; defends food security/MSP.
IEA (International Energy Agency)	1974; formed after 1973 Arab oil embargo by OECD countries	OECD member countries	India = Associate member (not full)	Oil crisis context: India's SPR does not meet IEA's 90-day import cover norm.	India is Associate member – cannot access full IEA emergency oil-sharing mechanisms. Full membership requires OECD membership.

Bilateral Agreements

Body / Forum / Agreement	India's Involvement	Type	Key Objective	India's Interest	Partner's Interest
India-Vietnam Enhanced Comprehensive Strategic Partnership	President Tô Lâm visit May 2026; upgraded from 2016 level	Bilateral Strategic-Economic	Deep defence, trade, maritime cooperation	BrahMos export discussions; trade target \$25 bn by 2030; Act East Policy; UNCLOS-based SCS rules	Counter Chinese SCS pressure; access to Indian defence tech and strategic support
India-NZ FTA (signed December 2025)	Fastest FTA completed (9 months; March-December 2025)	Bilateral Trade	Expand trade + investment; GI protection; talent mobility	\$20 bn investment/15 yrs; NZ gateway to Pacific; AYUSH recognition; Basmati + Darjeeling GI protection	Access to Indian market; Indian professionals for NZ economy; OECD alignment



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Body / Forum / Agreement	India's Involvement	Type	Key Objective	India's Interest	Partner's Interest
EFTA-India TEPA	PM Modi Oslo visit; EFTA = Norway, Switzerland, Iceland, Liechtenstein	Bilateral Trade + Investment	~\$100 bn investment in India over 15 years; green tech cooperation	Investment inflows; tech partnership; EFTA ≠ EU but strategically significant; green shipping + offshore wind	Access to large Indian market; talent cooperation; Indian strategic partner
India-Italy Strategic Partnership	PM Modi Europe trip – cultural + strategic engagement deepened	Bilateral Strategic-Cultural	Cultural ties + trade + technology cooperation	Italy = G7 + EU member; part of India-EU strategic engagement; civilisational connections	Access to Indian market; India as alternative manufacturing hub; strategic diversification
India-US (diverging interests)	Operation Sindoor context; Trump tariff pressure; chip export controls	Bilateral Strategic-Economic	Balance strategic partnership with India's autonomy	Strategic autonomy; tech access; market access; H-1B + immigration links for diaspora	Stable Indo-Pacific partner; Indian market access; alignment against China
India-Africa Forum Summit IV (IAFS IV)	India-hosted summit; fourth edition; delayed from 2020	Multilateral-Bilateral	Trade + investment + digital tools + pharma cooperation	Counter Chinese influence in Africa; UPI/digital exports; pharma market; goodwill	Access to Indian market + pharma + digital infrastructure; development partnership

Summits and Outcomes

Summit / Forum	Type	Key Focus / Outcome	India's Interest	Partner / Global Interest
AI Impact Summit (New Delhi, 2026)	India-hosted AI governance summit	3-pillar framework: Jan (people), Yojana (governance), Pragati (progress). Proposed charter for democratic AI governance.	AI governance leadership; 3-pillar framework as India's contribution to global AI norms.	Democratic, accountable AI development; prevent monopolisation of AI by few actors.



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Summit / Forum	Type	Key Focus / Outcome	India's Interest	Partner / Global Interest
IAFS IV (India-Africa Forum Summit, May 28–31)	Multilateral India-Africa forum	Trade, development, UPI exports, pharma, digital tools. Fourth summit after 2020 COVID delay.	Counter China's FOCAC influence; institutional engagement vs just goodwill.	Access to Indian market, pharma, digital infrastructure; development financing.
Trump-Xi Summit (May 2026)	Bilateral US-China diplomatic summit	Trade war, tech restrictions, Taiwan discussed. 9-year gap since last US presidential visit to China.	India watches closely: US-China rapprochement reduces pressure on China, affecting India's strategic positioning.	US: manage rivalry without conflict. China: relief from trade/tech restrictions.
PM Modi Europe Trip	Bilateral visits: Netherlands, Norway, Italy	Netherlands: ASML-ISM semiconductor cooperation. Norway: EFTA-TEPA + Green Strategic Partnership. Italy: cultural partnership.	Semiconductor supply chain security; \$100 bn EFTA investment commitment; tech diplomacy.	EU/EFTA: India as alternative manufacturing hub + strategic partner amid China-US rivalry.
Santa Marta Climate Conference (Colombia)	Outside-UNFCCC climate forum	France: oil+gas phase-out 2030–2050. 50+ countries. Faster decisions outside UNFCCC.	India NOT present. Watches closely – any framework must respect equity and climate justice for developing nations.	Developed countries: faster climate commitments outside slow UNFCCC consensus process.
UNOC 2025 (France)	UN Ocean Conference	FAO "Blue Transformation" – Four Betters: Better production, Better nutrition, Better environment, Better LIFE.	Blue Economy strategy; fisheries cooperation; ocean	Sustainable ocean-based food systems; marine biodiversity protection.





Summit / Forum	Type	Key Focus / Outcome	India's Interest	Partner / Global Interest
			governance alignment.	
Operation Sindoor (India-Pakistan, May 2026)	India's military-diplomatic operation	Tri-services strike on terror infrastructure. Doctrine shift: cross-border terror = act of war. TRF designated internationally post-op.	New deterrence posture. Trump announced ceasefire first. Pakistan used information warfare – India learned strategic communication lesson.	US urged restraint. Pakistan internationalised issue. Western countries mainly neutral. India-US divergence became visible.

Reports

Report / Index	Released By	What It Measures	Key Insight / Relevance	Anything About India
BUR-4 (4th Biennial Update Report)	India → UNFCCC (December 2024)	India's greenhouse gas emissions and climate actions	~8% decrease in GHG in 2020 vs 2019 – COVID dip, not structural trend. BUR = non-Annex-I country reporting obligation.	India on BUR series (not BR, which is for Annex-I developed countries). Net-zero target: 2070 (LT-LEDS).
AMOC weakening study (2026)	International climate scientists (peer-reviewed)	Atlantic Meridional Overturning Circulation strength projections	Could weaken by 59% by 2100 – stronger than earlier estimates. Arctic ice melt mechanism.	Effect on India: weakens Arabian Sea moisture-carrying winds → weaker Indian monsoon → agricultural risk.
16th Finance Commission report	Finance Commission of India	Centre-State tax revenue sharing formula	41% vertical devolution retained. Equity principle continued. Cesses excluded from divisible pool.	Southern states (TN, Karnataka, Kerala) share declining. North/central states gaining. States demanding 50%.
NSO Health Survey	National Statistical Office	Health insurance coverage and hospitalisation rates	3x increase in PMJAY coverage since 2018. But hospitalisation rates still	OOPE (out-of-pocket expenditure) trends mixed. Access gains not fully



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Report / Index	Released By	What It Measures	Key Insight / Relevance	Anything About India
(Ayushman Bharat)			below pre-expansion levels.	translating to utilisation gains.
India Labour Market Report (May 2026)	Labour Bureau / NSO	Employment quality and quantity	Gains in employment rates. But quality concern: informal, low-wage, gig work dominates.	1.4 million women elected reps in Panchayati Raj. Gig workers excluded from formal social protection.
India's import bill warning	RBI / Economic surveys	Trade deficit, import composition, CAD pressure	Crude oil + fertiliser imports rising due to West Asia tensions + weak rupee = double pressure.	India imports 85% crude oil. Potash 80-90% imported. Any supply disruption = CAD widening + rupee fall.
Fragile Five echo – rupee report	Morgan Stanley / Financial media	Rupee depreciation and CAD vulnerability	Rupee ~₹95-96/\$ in May 2026 – ~12% fall in one year. Echoes 2013 taper tantrum.	Structural challenge: CAD + FII dependence. RBI using forex reserves for managed float defence.





SCIENCE TECH

KEY TERMS	
Man-in-the-Loop Guidance	Missile/weapon system where a human operator can monitor and redirect the weapon mid-flight – as opposed to fire-and-forget. NASM-SR uses this. Operator can abort or redirect after launch based on real-time assessment.
Network-Centric Warfare	Military operations integrating sensors, communication, and weapons in real-time digital networks. ULPGM-V3 supports this – drones become smart platforms coordinating with other systems simultaneously.
Magnetosphere	Earth's magnetic field forming a protective bubble deflecting harmful solar wind particles. Without it, life on Earth would be impossible. SMILE mission will capture first X-ray images of its interaction with solar wind.
Mpro (Main Protease)	Enzyme coronaviruses (including COVID) need to cut protein chains for replication. Targeted by Ensitrelvir – humans lack an identical version, making it a safe and specific drug target.
Quasicrystal	An atomic structure that is ordered (not random) but does NOT repeat periodically – breaks normal crystallography rules. First natural quasicrystal found in Trinity nuclear test debris (red trinitite).
Clathrate	A cage-like crystal structure where atoms form cages trapping other atoms inside. Type-I clathrate (Si cages holding Ca+Cu atoms) newly discovered in Trinity nuclear test debris alongside earlier quasicrystal.
Fractional Quantum Hall Effect (FQHE)	Quantum phenomenon where electrons behave collectively and electrical resistance changes in fractions ($1/3$, $2/5$, etc.). Explained by quasiparticles called anyons with fractional charge. Now possible in pentalayer graphene WITHOUT strong magnetic fields.
Ensitrelvir	New anti-COVID antiviral drug targeting Mpro protease. More convenient than earlier Nirmatrelvir (no booster drug needed). Effective against related coronaviruses (SARS,



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MERS family) – potential broad-spectrum antiviral for future outbreaks.

Space

Mission Name	Space Agency	Year / Status	Objectives	Special Feature
SMILE (Solar wind Magnetosphere Ionosphere Link Explorer)	CNSA (China) + ESA (Europe) – joint mission	Launch: 2025-2026	Study how Earth's magnetosphere protects against solar wind. Capture X-ray images of magnetosphere-solar wind interaction. Study aurora formation mechanism.	FIRST joint China-ESA space mission. First X-ray imaging of Earth's magnetosphere in real-time. Solar storm impact on satellites, GPS, power grids = practical motivation.
Pathfinder satellite (Pixxel + Sarvam)	Pixxel (space company) + Sarvam (AI company) – India	Launch: 2026	Process AI workloads IN ORBIT using onboard GPUs. Carry hyperspectral imaging camera.	India's first orbital data centre satellite. Heat dissipation challenge in vacuum: ammonia heat pipes + radiator panels. Radiation damages chips in space. Reduces satellite data processing latency.
Gaganyaan ECLSS	ISRO – India	Upcoming crewed mission	Environmental Control and Life Support System: O ₂ supply, CO ₂ removal, temperature (20-26 °C), humidity, water, waste, fire safety.	Fans required in microgravity (no natural air circulation). Flames spread spherically in space (no convection) – harder to extinguish. Acts as artificial ecosystem inside spacecraft.
Dual-use satellites (concept)	Multiple agencies globally – ongoing	Ongoing development	Serve both civilian (GPS, internet, weather) and military (surveillance, targeting, communication) purposes simultaneously.	Outer Space Treaty (1967) = outdated for this reality. Cyber attacks, jamming, spoofing = new warfare mode with no visible damage. Attribution of space cyber attacks = extremely difficult.

Diseases in News



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Name	Symptoms	Causing Organism	Mode of Infection	Areas Spread	Genetic Material	Treatment	Vaccine
Bundibugyo Ebola (BDBV)	Fever, severe haemorrhage, organ failure, internal bleeding, high fatality	Bundibugyo ebolavirus (BDBV) – RNA filovirus	Direct contact with bodily fluids of infected person or animal; NOT airborne	Uganda, Democratic Republic of Congo (DRC); WHO PHEIC declared	RNA virus (single-stranded, negative-sense)	Supportive care; experimental antivirals (no approved specific treatment for BDBV)	No approved vaccine for BDBV species. Existing vaccines (Ervebo) target Zaire species only.
Hantavirus	HPS: fever, lung failure (up to 50% fatality). HFRS: fever, kidney failure (1-15% fatality)	Hantavirus (multiple strains – RNA virus)	Contact with rodent urine, saliva, droppings – NOT airborne person-to-person (only Andes strain: limited P2P)	Americas (HPS); Europe/Asia (HFRS). 2026: cruise ship outbreak Argentina→Spain	RNA virus (negative-sense, segmented)	Supportive care; ribavirin in some HFRS cases	No approved vaccine globally. Andes strain: only P2P transmission strain.
PCOS/PMOS (Polycystic Ovary / Polyendocrine Metabolic Ovarian Syndrome)	Irregular periods, excess androgens, weight gain, diabetes risk, fertility issues, mental health impact	Hormonal/metabolic disorder – not infectious	Not infectious; genetic + lifestyle + endocrine factors	Global; India prevalence ~16-18% (higher genetic diabetes risk in Indians)	Not applicable (non-infectious hormonal disorder)	Lifestyle management, hormonal therapy, metformin (for insulin resistance),	Not applicable – non-infectious condition





Name	Symptoms	Causing Organism	Mode of Infection	Areas Spread	Genetic Material	Treatment	Vaccine
						fertility treatment	
Fungal diseases (Aspergillosis, Candidiasis, Mucormycosis)	Respiratory infections, invasive organ infection, black eschar (mucormycosis), high mortality in immunocompromised	Aspergillus, Candida, Rhizopus (Mucor) – fungal pathogens	Airborne spores (Aspergillus, Mucor); endogenous overgrowth (Candida); NOT person-to-person	Global; India under-diagnosed and under-treated	Eukaryotic organism – no viral or bacterial genetic material	Antifungal drugs (amphotericin B, voriconazole, caspofungin) – NOT antibiotics (antibiotics are ineffective)	No broadly effective fungal vaccines available

Vaccines in News

Name	Type of Vaccine	Used in India?	Effective Till / Notes
Ensitrelvir (anti-COVID antiviral – NOT a vaccine)	Small molecule antiviral drug targeting Mpro (Main Protease). Drug, NOT vaccine.	Not yet (approved in Japan; under evaluation elsewhere)	Effective for COVID treatment + post-exposure prophylaxis. Potential broad-spectrum against SARS/MERS family coronaviruses. Duration of effectiveness still being studied.

Discoveries and Inventions

Name	What It Does	Sector	Applications	Shortcomings / Limitations
New clathrate crystal in Trinity test debris	Type-I clathrate (Si atom cages holding Ca+Cu) found in red trinitite – residue of first nuclear explosion (16 July 1945, Trinity Test, New Mexico). Earlier:	Materials Science / Nuclear Physics	Study of extreme-condition materials; novel crystal synthesis; materials formed under ultra-high energy.	Accessible only from nuclear test sites. Extreme conditions (21,000 tons TNT equivalent) not reproducible for research. Limited practical application directly.



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Name	What It Does	Sector	Applications	Shortcomings / Limitations
	quasicrystal found in same debris.			
Gold surface reconstruction – anti-rust mechanism	Gold surface atoms rearrange into tightly packed hexagonal patterns (surface reconstruction, Au(100) and Au(110) surfaces) → O ₂ molecules cannot split and bond → gold does not rust.	Surface Chemistry / Materials Science	Better gold catalyst design for industrial reactions; understanding corrosion resistance in other metals.	Computer simulation study – further experimental validation needed. Mechanism still not fully understood in all conditions.
Metamaterial that "learns" to change shape	Built a metamaterial that changes physical configuration in response to applied stimuli – programmable adaptive structure.	Advanced Materials / Robotics / Aerospace	Adaptive robotics, smart aircraft wings, medical implants that change shape, programmable stealth structures.	High cost of fabrication; currently laboratory-scale only; durability under repeated stimuli unknown.
FQHE in pentalayer graphene (without magnetic field)	Fractional Quantum Hall Effect observed in five-layer graphene WITHOUT requiring strong external magnetic fields. Anyons (fractional charge quasiparticles) formed.	Quantum Physics / Materials Science	Topological quantum computers; fault-tolerant quantum computing; fundamental physics research.	Still laboratory-scale; requires ultra-cold temperatures (millikelvin). Practical quantum computer applications remain 10-20+ years away.
Coherent Harmonic Focusing (CHF) – matter from light	Laser pulse fires at polished surface → generates harmonics → CHF compresses them to ultra-high intensity → approaching threshold for QED matter creation.	Quantum Physics / Laser Science	Fundamental physics (QED testing); potential future energy applications; ultra-intense light physics.	Matter from light NOT yet achieved – researchers showed pathway, not the result. Requires laser facilities not yet built. Theoretical and practical challenges remain large.
Psychedelics dissolving brain	fMRI study (~500 scans): LSD, psilocybin, DMT, mescaline,	Neuroscience / Psychiatry	PTSD treatment, treatment-resistant depression, anxiety	Long-term safety unclear for repeated use. Regulatory status (Schedule I/similar in most





Name	What It Does	Sector	Applications	Shortcomings / Limitations
hierarchy (Nature Medicine, 2026)	ayahuasca temporarily weaken brain's hierarchical communication structure – different regions communicate more freely.		disorders, end-of-life distress. Clinical trials ongoing.	countries) limits clinical access. Mechanism still not fully understood.
Orbital data centre satellite (Pathfinder – Pixxel + Sarvam)	Processes AI workloads IN ORBIT using onboard GPUs. Carries hyperspectral imaging camera. India's first such satellite.	Space Technology / AI	Reduce satellite data processing latency; AI earth observation; space-based computing.	Heat dissipation in vacuum is fundamental challenge (no air). Radiation damages chips. High cost. No successful full commercial orbital data centre globally yet.
SMILE mission imaging of magnetosphere	First X-ray images of Earth's magnetosphere interacting with solar wind. Studies aurora formation and solar storm mechanisms.	Space Science / Earth Science	Space weather prediction; protecting satellites and GPS; understanding planetary magnetic shields.	Joint China-ESA mission raises governance questions about data sharing with sensitive space data. Long data analysis pipeline before practical predictions improve.

Defence Tech

Name / Project	Developed By	What It Is	Special Feature / Relevance
NASM-SR (Naval Anti-Ship Missile – Short Range)	DRDO, India	Helicopter-launched anti-ship missile. Replaces older Sea Eagle missile (~580 kg → ~380 kg, lighter).	Man-in-the-loop guidance: operator can redirect mid-flight (NOT fire-and-forget). Targets waterline → causes flooding, disables ship quickly. Salvo launch tested (multiple missiles simultaneously overwhelm defences).
ULPGM-V3 (UAV-Launched Precision Guided Missile)	DRDO, India	V3 = first version that hits BOTH ground targets AND aerial threats (drones, helicopters). Launched from drones.	V1: free-fall. V2: propulsion + range. V3: anti-aerial capability added. Two-way communication: target changeable mid-flight. Works day/night, plains/high altitude. Converts drones into smart network-centric attack platforms.



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Name / Project	Developed By	What It Is	Special Feature / Relevance
Project 17A – Nilgiri-class frigates	Indian Navy + L&T + GRSE (Indian shipyards)	7 stealth frigates. INS Mahendragiri delivered April 2026. Anti-air + anti-submarine + anti-surface warfare capabilities.	₹45,000 crore. CAG audit: ships declared "complete" but NOT fully combat-ready – imported systems (radars, sonars, engines) delayed. Design changes + incomplete system integration flagged.
Operation Sindoor (7 May 2025)	Indian Armed Forces (Tri-services)	India's military response to Pahalgam terror attack (22 April 2025). Targeted terror infrastructure in Pakistan.	Doctrine shift: cross-border terror now declared "act of war." TRF internationally designated post-operation. Trump announced ceasefire before India officially. Pakistan used aggressive information warfare. India learned: strategic communication = military action in importance.
Dual-use satellites	Multiple space agencies globally	Satellites serving both civilian (GPS, internet, weather) and military (surveillance, targeting, communication) purposes simultaneously.	Outer Space Treaty (1967) not designed for this. Cyber attacks, jamming, GPS spoofing = new warfare modes with no visible damage. "Silent disruption" can cripple national infrastructure without formal war declaration. Attribution extremely difficult.
Cell Broadcast System (India's emergency alert)	C-DOT (Centre for Development of Telematics), under DoT	Sends ONE message to ALL phones in a mobile tower's coverage area simultaneously. No SIM registration needed. Overrides silent/DND mode.	Based on ITU (International Telecommunication Union) standards. Works during network congestion (unlike SMS). Geo-targeted – only alerts affected area. Critical for disaster warnings and civilian protection.
Quantum computing – radiation decoherence challenge	Multiple international quantum computing labs	Background radiation (cosmic rays, natural radioactivity) causes qubit decoherence – randomly flips quantum bits.	Defence relevance: quantum computers could break current encryption (RSA etc.) – quantum-safe cryptography is a defence priority. Radiation-hardened chips exist but are less powerful. Millikelvin temperature requirement = engineering challenge.





MAPS

KEY TERMS	
EEZ (Exclusive Economic Zone)	Maritime zone extending 200 nautical miles from a country's coastline where it has exclusive rights to marine resources. India's EEZ = 2.37 million sq km. South China Sea disputes involve overlapping EEZ claims.
Chokepoint	A narrow strategic waterway where significant maritime trade can be disrupted. Key chokepoints: Strait of Hormuz (~20% global oil trade), Strait of Malacca (~80% China's oil), Bab-el-Mandeb (Red Sea-Indian Ocean link), Taiwan Strait.
Nine-Dash Line	China's expansive claim covering ~90% of the South China Sea. Rejected as having NO legal basis under UNCLOS by the 2016 Arbitral Tribunal. China does not recognise the ruling.
Antecedent Drainage	A river whose course predates the mountains it flows through – carved its valley before the land uplifted around it. Brahmaputra is the classic Indian example: older than the Himalayas, flows through a deep gorge.
PVTG (Particularly Vulnerable Tribal Group)	Sub-category of Scheduled Tribes identified as especially vulnerable: declining population, pre-agricultural economy, low literacy. India has 75 PVTGs. Shompen (Great Nicobar) and Birhor (Saranda/Jharkhand) are PVTGs.

Strategic Waterways

Waterway	Bordering Countries / Entities	Who Must Cross It	Key Exam Facts
Strait of Hormuz	Iran (north); Oman – Musandam Peninsula (south)	Bahrain, Qatar, Kuwait, Iraq ships → to reach Indian Ocean	~20% of global oil trade. Bab-el-Mandeb = SEPARATE Red Sea chokepoint (Houthi attacks 2024-26 disrupted that route). Musandam = Omani exclave. Syria + Egypt do NOT cross Hormuz.
Strait of Malacca	Malaysia/Thailand (north); Indonesia/Sumatra (south)	Ships from Middle East/Indian Ocean → East Asia (China, Japan, South Korea)	Narrowest: ~2.8 km near Singapore. ~80-90% of China's oil imports. NOT controlled by any single country. Most critical chokepoint for East Asian energy supply.



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Waterway	Bordering Countries / Entities	Who Must Cross It	Key Exam Facts
South China Sea	China, Vietnam, Philippines, Malaysia, Brunei (overlapping claims)	Critical for oil transit from Persian Gulf to NE Asia; also serves SE Asian shipping	~\$5 trillion annual trade. Nine-Dash Line rejected by 2016 UNCLOS Arbitral Tribunal. China does not recognise ruling.
Bab-el-Mandeb	Yemen (east); Djibouti and Eritrea (west)	Ships: Red Sea → Indian Ocean (Suez Canal route users)	Houthi attacks 2024-26 severely disrupted Red Sea-Suez route. Ships rerouted around Africa = longer + costlier. "Gate of Tears" in Arabic. Separate from Hormuz disruption – two different chokepoints.



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