

# MARCH., 2026

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## 30 PAGER NOTES

MARCH 2026 DECODED FOR  
PRELIMS — WHERE  
GOVERNANCE, ECONOMY,  
SCIENCE, ENVIRONMENT, AND  
MAPS CONVERGE INTO EXAM-  
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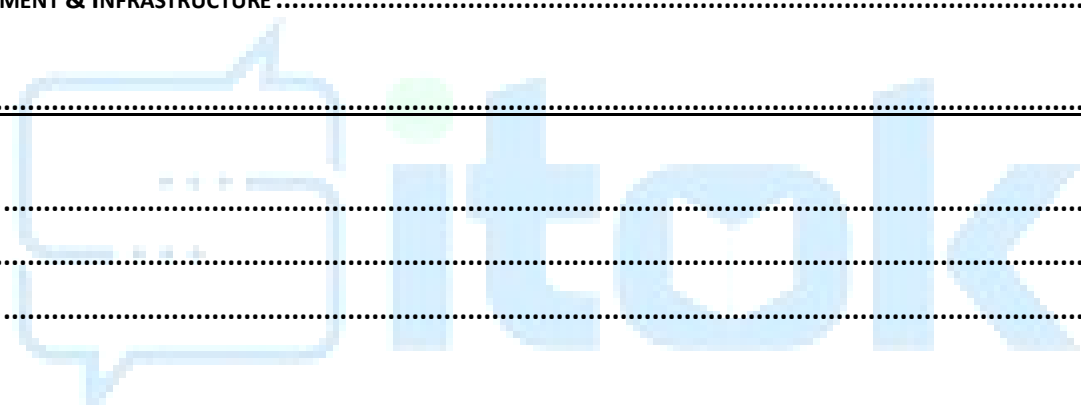
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## POLITY

### Acts & Bills

| Topic  | Easy Explanation  | Relevance / Example   |
|--|---|---|
| National Security Act (NSA) Amendment, 2026                  | A legislative update aiming to streamline preventive detention procedures for cyber-terrorism.                          | Introduces the definition of "Digital Sabotage"; empowers agencies to freeze assets of suspects before a formal charge-sheet.                 |
| The Cinematograph (Certification) Rules, 2024 (March Review) | Updated rules governing age-based certification (U/A 7+, 13+, 16+) and anti-piracy measures.                            | Establishes "Authorized Signatories" to tackle the unauthorized recording of films in theaters with a 3-year jail term.                       |
| Disaster Management (Amendment) Bill                         | A bill to create a statutory framework for the "National Disaster Management Authority" to handle biological disasters. | Based on lessons from the 2020 pandemic; mandates states to create "Bio-Security Plans" and integrates local panchayats in the funding chain. |
| Model Tenancy Act (March Implementation Report)              | A central model law to regulate the rental housing market by balancing rights of landlords and tenants.                 | Several states (UP, AP) reported a 15% rise in formal rental registrations after setting up "Rent Authorities" as per the Act.                |

### Constitutional Provisions & Federalism

| Topic                               | Easy Explanation  | Relevance / Example   |
|-------------------------------------|---|---|
| Article 131 (Original Jurisdiction) | The power of the Supreme Court to hear disputes between the Centre and States directly. | Kerala and West Bengal invoked this in March 2026 to challenge the Centre's control over "Extra-Budgetary Borrowings" (EBBs). |



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|   |   |  |
|---|---|--|
| Article 243-K<br>(State Election Commission)  | Provisions regarding the appointment and conditions of service for the State Election Commissioner (SEC).     | The SC ruled in March that SECs must be "independent persons," not government officials holding additional charges, to ensure local poll integrity.          |
| 6th Schedule Expansion<br>(Ladakh)            | Constitutional provisions for the administration of tribal areas through Autonomous District Councils (ADCs). | The Home Ministry is negotiating a "modified" 6th Schedule for Ladakh to protect local land, jobs, and the fragile Himalayan ecology.                        |
| Inter-State River Water Disputes<br>(Art 262) | Constitutional bar on the SC's jurisdiction over river disputes, replaced by dedicated Tribunals.             | The Krishna Water Dispute Tribunal (KWDT-II) issued a March deadline for water-sharing between Telangana and AP, testing the "Cooperative Federalism" model. |

## Governance & Judicial Reforms

| Topic                               | Easy Explanation   | Relevance / Example   |
|-------------------------------------|--|---|
| E-Courts Phase III (March Launch)   | The digitization of the Indian judiciary, shifting from "scanning" to "cloud-native" AI processing.          | Introduced "Digital Courts" for 24/7 filing; includes a "Judgment Translation Tool" to provide SC orders in 22 regional languages.                |
| CBI 'General Consent' Debate        | The requirement for states to give a blanket permission for CBI to investigate crimes in their territory.    | More states withdrew "General Consent" in March, arguing it protects "Federal Autonomy" against the perceived misuse of central agencies.         |
| Citizen's Charter 2.0               | A refreshed government document promising specific delivery times for public services (passports, licenses). | Integrated with the "Sevottam" model; links officer promotions to their "Grievance Redressal" score on the CPGRAMS portal.                        |
| Special Marriage Act (Digitization) | A move to allow the online registration of marriages under the 1954 Act.                                     | Aims to reduce physical harassment of inter-faith/inter-caste couples; SC currently reviewing the "30-day public notice" requirement for privacy. |





## Judgements & Rights

| Topic                                  | Easy Explanation   | Relevance / Example   |
|--|--|---|
| Right to be Forgotten (Delhi HC)       | The right to have private or outdated information removed from search engines and public records.              | Court ordered the removal of an old acquittal record from Google, citing that "past shadows" shouldn't haunt an individual's professional future. |
| Doctrine of Legitimate Expectation     | A legal principle where citizens expect the government to act consistently with its past promises or policies. | Used by solar power developers to stop states from "retroactively" cancelling Power Purchase Agreements (PPAs) signed 5 years ago.                |
| Marital Rape Exception (Supreme Court) | The ongoing legal debate on whether the immunity given to husbands in Section 375 of IPC is unconstitutional.  | The SC bench is hearing final arguments; the verdict will define the "Bodily Autonomy" of women vs. the "Institution of Marriage."                |

## Government Schemes

| Scheme / Initiative                                      | Explanation (Simple)   |
|--|--|
| <b>National Critical Mineral Mission (2025)</b>          | A government mission to secure <b>critical minerals (like rare earths)</b> by developing full supply chains — from mining to recycling — to reduce dependence on countries like China. |
| <b>Citizen's Charter 2.0</b>                             | A reform initiative to ensure <b>time-bound delivery of public services</b> (passports, licenses), linked with performance tracking of officials via grievance systems.                |
| <b>E-Courts Phase III</b>                                | A major digital initiative to modernise judiciary with <b>AI-based systems, 24/7 filing, and multilingual judgments</b> .  |
| <b>Green Hydrogen Hubs</b>                               | Government plan to set up <b>industrial zones for green hydrogen production</b> , storage, and export (e.g., Kandla, Tuticorin).   |
| <b>Extended Producer Responsibility (EPR) – Textiles</b> | Policy making clothing companies responsible for <b>recycling textile waste</b> , targeting fast fashion pollution.  |





|   |  |
|---|--|
| <b>Right to Repair (Electronics Circular Economy)</b> | Policy requiring companies to provide <b>spare parts and repair info</b> to reduce e-waste and increase product life.      |
| <b>PM MITRA Parks Scheme</b>                          | Mega textile parks to create <b>integrated value chain (fiber → fabric → fashion)</b> and boost manufacturing and exports. |
| <b>Open Network for Digital Commerce (ONDC)</b>       | Govt-backed platform to <b>break monopoly of big e-commerce firms</b> , allowing small retailers to compete.               |
| <b>CBDC – Digital Rupee (Offline Mode)</b>            | RBI initiative enabling <b>digital payments without internet</b> , using Bluetooth/NFC — helpful for rural areas.          |
| <b>Inland Waterways (NW-1 Development)</b>            | Government initiative to develop <b>Ganga as a transport corridor</b> with multi-modal terminals to reduce logistics cost. |
| <b>Shipbuilding Revitalisation Package (2026)</b>     | ₹69,725 crore package to boost India's <b>shipbuilding industry</b> , upgrade infrastructure, and increase capacity.       |



| Topic   | Easy Explanation  | Relevance / Example   |
|---|---|---|
| Green Hydrogen Hubs (March Allotment)             | Designated industrial zones for the integrated production, storage, and export of Green Hydrogen. | The government identified Kandla and Tuticorin as the first two hubs; aimed at replacing "Grey Hydrogen" in oil refineries.   |
| Blue Economy 2.0 Policy                           | A framework for the sustainable use of ocean resources for economic growth.                       | Focuses on "Deep Sea Mining" of Poly-metallic nodules and "Ocean Thermal Energy Conversion" (OTEC) in the Lakshadweep region. |
| Extended Producer Responsibility (EPR) - Textiles | A policy making clothing brands responsible for the recycling and disposal of their waste.        | Aims to tackle the "Fast Fashion" waste crisis; mandatory 20% recycled fiber content for major brands by 2027.                |





|                                 |   |  |
|---------------------------------|---|--|
| Circular Economy in Electronics | Laws mandating the "Right to Repair" for smartphones and laptops to reduce e-waste. | Manufacturers must provide spare parts and repair manuals for 7 years; reduces the "Planned Obsolescence" trend. |
|---------------------------------|---|--|

## Economic Trends & Fiscal Policy

| Topic                           | Easy Explanation  | Relevance / Example  |
|---------------------------------|---|--|
| T+0 Settlement Cycle            | An equity market system where shares and money are transferred on the same day as the trade.            | SEBI launched this for a limited set of stocks in March; makes India the first major market to move faster than the US (T+1).  |
| Core Sector Growth (March Data) | The performance of the 8 "Key" industries that make up 40% of the Index of Industrial Production (IIP). | Steel and Cement showed 10%+ growth, signaling a "Construction Boom" driven by the PM Awas Yojana and Gati Shakti infra.       |
| CBDC - Retail (Offline Mode)    | The launch of the Digital Rupee (e₹-R) functionality that works without an internet connection.         | Uses "Bluetooth/NFC" technology; aims to increase digital adoption in rural areas with poor connectivity.                      |
| Direct Tax-to-GDP Ratio         | The percentage of national income coming from personal and corporate income taxes.                      | Reached a record high of 6.2% in FY26; attributed to "Data Integration" between GSTN and Income Tax portals (Project Insight). |

## Sectoral Development & Infrastructure

| Topic                                    | Easy Explanation  | Relevance / Example   |
|--|---|---|
| PM Mitra Parks (Status Update)           | Large-scale Integrated Textile Regions and Apparel parks being set up across 7 states.              | March saw the first operational units in Gujarat; aims to create an "End-to-End" value chain from Fiber to Fashion. |
| Open Network for Digital Commerce (ONDC) | A government-backed platform to "unbundle" e-commerce, allowing small shops to compete with giants. | March data showed a 3x jump in "Grocery" orders; reduces the high commissions charged by private aggregators.       |





|                                     |   |  |
|-------------------------------------|---|--|
| Semiconductor Fabrication (Dholera) | Progress report on India's first major commercial "Chip Fab" plant.               | Construction hit the 50% mark in March; expected to produce 28nm legacy chips for the automotive and defense sectors by 2027.    |
| Inland Waterways (NW-1 Expansion)   | The development of the Ganga River (Haldia to Prayagraj) for large cargo vessels. | New "Multi-modal Terminals" at Varanasi became fully operational in March, cutting coal transport costs by 20% compared to rail. |

## Environment

### Laws and Policies

| Why in News?  | Key Points   | Main Objective   |
|---|--|--|
| <b>India's updated climate targets (NDC discussion)</b> | India's targets described as "modest but significant"; focus on emission intensity reduction, renewable expansion, and gradual transition; emphasis on balancing development and climate responsibility. | Fulfil commitments under Paris Agreement while ensuring sustainable development. |
| <b>Carbon Credit Trading Framework (India)</b>          | Editorial flagged lack of clarity in India's carbon credit market; issues in measurement, verification, and regulatory structure; need for transparency and strong institutional framework.              | Create a domestic carbon market to incentivise emission reduction.               |
| <b>Forest Finance (Belém model discussion)</b>          | Discussion on innovative financing models for forests; focus on global mechanisms linking conservation with financial incentives; need for scalable funding.   | Mobilise financial resources for forest conservation and climate mitigation.     |
| <b>Climate Science Credibility &amp; Policy Gap</b>     | Article explained how climate science is validated (peer review, models, long-term   | Strengthen evidence-based policymaking and                                       |



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|--|---|---|
|  | data) and highlighted gap between scientific evidence and policy action.  | bridge science-policy gap.  |
| <b>Climate Resilience via Water Management</b> | Editorial emphasised water-centric climate adaptation strategies (storage, conservation, efficient use); water seen as core to resilience planning. | Build climate-resilient systems through integrated water resource management. |

## Terms

| Term  | Meaning  | Context / Where Used                 | Key Points   |
|---|--|--------------------------------------|--|
| <b>Microplastics</b>                              | Plastic particles <5 mm in size.                                       | Chennai coastal pollution issue.     | Originate from breakdown of larger plastics, cosmetics, textiles; enter food chain; persistent pollutants. |
| <b>Cryosphere Instability</b>                     | Destabilisation of frozen components of Earth (glaciers, ice patches). | Glacier ice-patch study (ISRO).      | Leads to sudden floods, glacier retreat, landscape change.   |
| <b>Ice Patches (Glacial)</b>                      | Remnant ice masses exposed as glaciers melt.                           | Srikanta glacier case.               | More unstable than glaciers; can collapse suddenly.  |
| <b>Seismic Zoning</b>                             | Classification of regions based on earthquake risk.                    | Himalayan building code debate.      | Determines construction standards and disaster preparedness.   |
| <b>Climate Resilience</b>                         | Ability of systems to withstand and recover from climate shocks.       | Water-centric adaptation discussion. | Includes infrastructure, ecosystems, and communities.  |
| <b>Carbon Credits</b>                             | Tradable permits representing emission reductions.                     | India carbon market discussion.      | Require MRV (Measurement, Reporting, Verification).  |
| <b>MRV (Measurement, Reporting, Verification)</b> | System to track emissions and reductions.                              | Carbon market framework.             | Ensures transparency and credibility.  |





|                                     |   |                                      |   |
|-------------------------------------|---|--------------------------------------|---|
| <b>Forest Finance</b>               | Funding mechanisms for forest conservation.               | Belém model discussion.              | Includes carbon markets, international funding, ecosystem payments. |
| <b>Science-Policy Gap</b>           | Disconnect between scientific evidence and policy action. | Climate science credibility article. | Delays effective climate response.                                  |
| <b>Landscape-level Conservation</b> | Conservation approach beyond protected areas.             | Jungle cat study implication.        | Includes farms, grasslands, corridors.                              |
| <b>Habitat Fragmentation</b>        | Breaking of continuous habitat into smaller patches.      | Jungle cat threats.                  | Reduces biodiversity, increases conflict.                           |
| <b>Ecological Corridors</b>         | Pathways connecting fragmented habitats.                  | Conservation planning discussion.    | Enable species movement and gene flow.                              |
| <b>Flyways (Migratory Routes)</b>   | Routes used by migratory birds.                           | Long-distance bird discussion.       | Require international cooperation.                                  |

### Additional Notes

| Theme                                      | Core Idea  | Key Features  | Why Important  |
|--|--|---|--|
| <b>Conservation Beyond Protected Areas</b> | Wildlife exists outside forests and protected areas.                           | Species like jungle cat thrive in agro-pastoral landscapes; conservation must include farms, grasslands, and open ecosystems; need for ecological corridors beyond forests. | Challenges traditional conservation model; highlights need for <b>landscape-level planning</b> . |
| <b>Landscape-Level Conservation</b>        | Conservation approach covering entire ecosystems rather than isolated patches. | Integrates forests, farmlands, human settlements; ensures species movement and gene flow; reduces fragmentation impacts.  | Emerging global approach; replaces “fortress conservation”.                                      |
| <b>Cryosphere Instability</b>              | Climate change destabilising   | Glacier retreat, exposure of ice patches, increased   | Indicates climate change is causing <b>non-linear and</b>  |





|  |  |  |  |
|--|--|--|--|
|  | glaciers and frozen systems.                                   | meltwater variability; leads to sudden hazards.  | <b>sudden impacts</b> , not gradual change.                                      |
| <b>Ice Patch Hazard</b>                      | Ice patches exposed after glacier retreat are highly unstable. | Smaller than glaciers; collapse easily; can trigger flash floods downstream; linked to Srikanta glacier case.                                | New dimension of glacial risk; important for Himalayan disaster studies.         |
| <b>Microplastic Pollution</b>                | Tiny plastic particles (<5 mm) spreading across ecosystems.    | Originate from plastic breakdown, textiles, tyre wear; enter marine systems; bioaccumulate in food chains; persistent and non-biodegradable. | Represents <b>next-generation pollution challenge</b> (invisible, irreversible). |
| <b>Climate Policy Implementation Gap</b>     | Gap between climate commitments and execution.                 | Weak regulatory clarity; institutional gaps; issues in carbon market functioning; delays in action.  | Key governance issue — laws exist but implementation lags.                       |
| <b>Carbon Market Evolution (India)</b>       | Shift toward market-based emission reduction mechanisms.       | Carbon credits, MRV systems, trading frameworks; still evolving regulatory structure.  | Future of climate governance; high UPSC relevance.                               |
| <b>Science–Policy Gap</b>                    | Disconnect between scientific evidence and policy decisions.   | Climate science is robust, but policy action is delayed; influenced by economic and political constraints.                                   | Explains slow climate response globally.   |
| <b>Water-Centric Climate Resilience</b>      | Water as central variable in climate adaptation.               | Affects agriculture, floods, droughts, glacier systems; integrated water management required.  | Links multiple sectors — agriculture, disaster, climate.                         |
| <b>Seismic Vulnerability (Himalayas)</b>     | High earthquake risk in mountain regions.                      | Fragile geology; active tectonics; building codes often outdated; compounded by climate impacts.   | Multi-hazard risk zone; important for disaster management.                       |
| <b>Climate + Geological Risk Interaction</b> | Overlap of climate hazards and geological risks.               | Glacier melt + landslides + earthquakes; cascading disasters possible.   | Shows complexity of modern environmental risks.                                  |





|                              |   |  |   |
|------------------------------|---|--|---|
| <b>Forest Finance Models</b> | New ways to fund conservation globally. | Carbon markets, international funding, ecosystem payments; Belém model discussion. | Conservation increasingly tied to financial mechanisms. |
|------------------------------|---|--|---|

## Organisations

| Organisation | Formed (Why)  | Members  | Observers               | Why in News (March 2026)  | India's Role  |
|--------------|---|--|-------------------------|---|---|
| <b>BRICS</b> | 2006/2009 – Cooperation among emerging economies for multipolar world | Brazil, Russia, India, China, South Africa (+ new members) | Partner countries       | Focus on <b>scientific &amp; technological collaboration</b> ; evolving as STI platform | India can push institutional strengthening during its leadership role                         |
| <b>WTO</b>   | 1995 – Regulate global trade & dispute settlement                     | 164 countries  | IMF, World Bank, UNCTAD | Discussions on <b>MC14 and reform of global trade system</b>                            | India pushes for fair trade rules, agriculture protection, SDT reforms                        |
| <b>NATO</b>  | 1949 – Collective defence alliance against security threats           | 32 members (USA, UK, France, Germany, etc.)                | Partner countries       | Debate on <b>NATO role in Iran conflict &amp; US pressure on allies</b>                 | India is not a member; maintains strategic autonomy while engaging NATO countries bilaterally |

## Bilateral Agreements

|                   |                            |
|-------------------|----------------------------|
| <b>Body/Forum</b> | <b>India's Involvement</b> |
|-------------------|----------------------------|



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|--|---|
| <b>India–Brazil (Rare Earth MoU)</b>               | India signed an agreement with Brazil for cooperation in <b>critical minerals (rare earths)</b> — covering exploration, mining, processing, recycling, and refining. Aims to reduce dependence on China and strengthen supply chains for EVs, defence, electronics. |
| <b>India–USA Trade Negotiations</b>                | Interim trade deal under discussion; tariff reductions (50% → 25% → possible 18%) affected by <b>US Supreme Court ruling</b> . Negotiations delayed but ongoing; reflects uncertainty in global trade rules.  |
| <b>India–EU Cooperation (Emerging Partnership)</b> | Talks on <b>FTA, investment, connectivity (IMEC), digital infrastructure (Blue Raman cable), green shipping corridors</b> . Increasing convergence due to US policy unpredictability.   |
| <b>India–China (Border Talks Continuation)</b>     | Talks continue based on <b>2005 Political Parameters Agreement</b> ; disputes over Aksai Chin & Arunachal persist; trust deficit remains post-Galwan.   |
| <b>India–Canada (Uranium Deal)</b>                 | Canada supplying uranium to support India’s nuclear energy expansion. Helps diversify nuclear fuel sources.   |

## Summits and Outcomes

| Summit / Forum   | Key Outcomes   |
|--|--|
| <b>AI Impact Summit 2026 (India)</b>                           | Released <b>AI Impact Casebooks</b> showcasing AI use in agriculture, healthcare, education, accessibility, women empowerment — focus on Global South solutions. |
| <b>WTO MC14 (Upcoming Ministerial Conference)</b>              | Focus on <b>trade reforms, agriculture issues, dispute settlement revival</b> — key for India’s trade interests.   |
| <b>BRICS Cooperation Discussions</b>                           | Increasing focus on <b>science, tech, and strategic coordination</b> among emerging economies.   |
| <b>India–EU Strategic Engagement (Pre-Summit Developments)</b> | Strengthening ties in <b>trade, connectivity (IMEC), green tech, migration, defence cooperation</b> — groundwork for formal summit.                              |

## Reports

| Report / Index               | Released by  | What It Measures                     | Key Insight / Relevance                          |
|------------------------------|--------------|--------------------------------------|--|
| <b>Climate Commitments /</b> | Under UNFCCC | Countries’ climate targets (emission | India’s targets described as “ <b>modest but</b> |



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|  |  |  |   |
|--|--|--|---|
| <b>NDC Review (Global Context)</b>                           |  | reduction, renewable energy, etc.)                                       | <b>significant</b> ” — balancing development with climate responsibility.                           |
| <b>Global Carbon Market Discussions</b>                      | Various global climate bodies (UN + national frameworks)                     | Mechanisms for <b>carbon credit trading</b> and emission reduction       | India moving toward <b>market-based climate governance</b> , but regulatory clarity still evolving. |
| <b>Forest Finance Models (Belém Model discussion)</b>        | Global climate finance discourse (linked to Amazon/Global South initiatives) | Financing conservation through <b>carbon markets, ecosystem payments</b> | Shows shift → <b>environment linked with finance</b> , important for climate governance questions.  |
| <b>Climate Science Validation (Global Scientific System)</b> | Global scientific institutions (IPCC-type ecosystem)                         | Validity of climate science via models, peer review, long-term data      | Highlights <b>science-policy gap</b> → strong science but weak policy action globally.              |

## Science Tech

### Space

| <b>Mission Name</b>       | <b>Space Agency</b> | <b>Year Launched</b>         | <b>Objectives</b>  | <b>Special Feature</b>   |
|---------------------------|---------------------|------------------------------|--|--|
| <b>Artemis II Mission</b> | NASA                | 2026 (planned/ongoing phase) | To send astronauts around the Moon (crewed flyby) and test systems for future lunar landing and deep space missions. | First human mission beyond low Earth orbit in ~50 years; step toward <b>permanent lunar base and Mars missions</b> . |
| <b>Artemis Programme</b>  | NASA                | Artemis I (2022 onward)      | Long-term human presence on Moon; use Moon as  | Shift from <b>exploration</b> → <b>habitation</b> ; includes lunar base,   |



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|---|-------------------|---|--|--|
| <b>(Overall Lunar Programme)</b>                    |                   |   | stepping stone for Mars.   | infrastructure, and international collaboration.   |
| <b>SpaceX Starship (Lunar Lander for Artemis)</b>   | SpaceX (for NASA) | Under development                         | To act as lunar lander for astronauts under Artemis programme.                           | Facing <b>~2-year delay</b> ; requires complex <b>in-orbit refuelling with multiple launches</b> (major technological challenge).              |
| <b>NavIC Satellite System (IRNSS constellation)</b> | ISRO (India)      | Operational since 2013 (ongoing launches) | Regional navigation system providing positioning, navigation, and timing (PNT) services. | Facing crisis: <b>satellite failures, atomic clock issues, NVS-02 launch error</b> ; highlights importance of space infrastructure resilience. |

## Diseases in News

| Name                            | Symptoms  | Causing Organism                             | Mode of Infection             | Areas Spread                       | Genetic Material | Treatment                                | Vaccin                      |
|---------------------------------|---|--|-------------------------------|------------------------------------|------------------|--|-----------------------------|
| <b>Melanoma (Skin Cancer)</b>   | Skin lesions, tumour growth, metastasis                     | Abnormal cell growth (melanocytes)           | Non-infectious                | Global                             | Not applicable   | Surgery, immunotherapy, targeted therapy | No                          |
| <b>Herpes (Prison Outbreak)</b> | Skin lesions, sores, fever (severe cases fatal)             | Herpes Simplex Virus (HSV)                   | Direct contact, bodily fluids | Local outbreak (Jalpaiguri prison) | DNA virus        | Antivirals (acyclovir)                   | No (limited vaccines)       |
| <b>Tuberculosis (TB)</b>        | Cough, fever, weight loss, fatigue; extrapulmonary symptoms | <i>Mycobacterium tuberculosis</i> (bacteria) | Airborne (droplets)           | High burden in India               | DNA bacteria     | Antibiotics (long-term regimen)          | Yes (BCG, limited efficacy) |





|   |   |                                    |                          |                                       |              |                                      |               |
|---|---|------------------------------------|--------------------------|---------------------------------------|--------------|--------------------------------------|---------------|
| <b>Extrapulmonary TB (EPTB)</b>               | Organ-specific symptoms (non-lung), infertility (in some cases) | Same as TB                         | Same as TB               | India (notably among women)           | DNA bacteria | Antibiotics                          | BCG (limited) |
| <b>HIV/AIDS (mentioned in prison context)</b> | Immune suppression, infections                                  | Human Immunodeficiency Virus       | Blood, sexual contact    | Global; vulnerable prison populations | RNA virus    | Antiretroviral therapy               | No            |
| <b>COVID-19 (reference)</b>                   | Fever, cough, respiratory illness                               | SARS-CoV-2                         | Airborne                 | Global                                | RNA virus    | Supportive + antivirals              | Yes           |
| <b>Skin Diseases (general prison context)</b> | Rashes, itching, infections                                     | Various (fungal, bacterial, viral) | Contact, hygiene-related | High in overcrowded settings          | Varies       | Medication (antifungal, antibiotics) | No            |
| <b>Nicotine Addiction (Health Concern)</b>    | Dependence, cardiovascular & lung issues                        | Chemical (nicotine, not organism)  | Consumption (or          |                                       |              |                                      |               |

### Vaccines in news

| Name  | Type of Vaccine                 | Used in India?                  | Effective Till   |
|---|---------------------------------|---------------------------------|--|
| <b>Covishield (Oxford–AstraZeneca COVID-19 Vaccine)</b> | Viral Vector (Adenovirus-based) | Yes (widely used in India)      | Short-term + booster-based immunity (varies with variants) |
| <b>Covaxin (India COVID-19 Vaccine)</b>                 | Inactivated Virus Vaccine       | Yes (developed & used in India) | Similar booster-based protection (variant dependent)       |
| <b>Johnson &amp; Johnson COVID-19 Vaccine</b>           | Viral Vector (Adenovirus-based) | Limited use in India            | Short-term + booster-based immunity                        |



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|   |              |  |  |
|---|--------------|--|--|
| <b>Pfizer–BioNTech COVID-19 Vaccine</b> | mRNA Vaccine | Not widely used in India                 | Strong but waning immunity over time → boosters needed |
| <b>Moderna COVID-19 Vaccine</b>         | mRNA Vaccine | Not used in India (commercially limited) | Similar to Pfizer; booster-dependent protection        |

## Discoveries and Inventions

| Name  | What It Does   | Sector                          | Applications  | Shortcomings  |
|---|--|---------------------------------|---|---|
| <b>Discovery of “Toponium” (New Particle at CERN)</b>       | First-ever observation of a short-lived particle made of top quark + anti-top quark. | Particle Physics                | Helps understand <b>fundamental forces &amp; early universe conditions.</b> | Extremely unstable; only detectable in high-energy experiments. |
| <b>RNA-Based Origin of Life Study</b>                       | Supports theory that life began from <b>self-replicating RNA molecules.</b>          | Molecular Biology / Evolution   | Helps explain <b>origin of life on Earth.</b>                               | Still theoretical; lacks full experimental proof.               |
| <b>QR Code-based Data Storage in Synthetic Polymers</b>     | Stores digital data in physical polymer materials (QR-like encoding).                | Material Science / Data Storage | Long-term data storage beyond traditional digital media.                    | Scaling and retrieval complexity.                               |
| <b>AI Model Predicting Protein Interactions</b>             | Uses AI to predict how proteins interact in the body.                                | AI + Biotechnology              | Drug discovery, disease understanding.                                      | Requires high-quality datasets; validation needed.              |
| <b>Lipid (Cholesterol) Role in Cancer Spread (Melanoma)</b> | Discovery that cholesterol helps cancer cells spread.                                | Cancer Biology                  | New <b>target for anti-cancer drugs.</b>                                    | Early-stage research.   |





|  |  |                               |  |                                      |
|--|--|-------------------------------|--|--------------------------------------|
| <b>AI-based TB Detection (Chest X-ray)</b> | Uses AI to detect tuberculosis early.            | AI / Healthcare               | Faster diagnosis, especially in rural areas. | False positives/negatives possible.  |
| <b>Nicotine Pouch Delivery Technology</b>  | Tobacco-free nicotine delivery via oral pouches. | Public Health / Consumer Tech | Alternative to smoking.                      | Addiction risk; regulatory concerns. |

## Defence Tech

| Topic  | Easy Explanation   | Key Takeaway / Relevance   |
|--|--|--|
| <b>Rafale Fighter Jet Deal (India–France)</b>  | India approved purchase of <b>114 Rafale jets</b> — 18 imported, 96 to be manufactured in India under Make in India. | Big defence deal (~₹3.25 lakh crore). Strengthens air power but raises concerns about <b>technology dependency</b> . |
| <b>Limited Technology Transfer Issue</b>       | France is not sharing <b>critical source codes</b> (radar, EW systems, mission software).                            | Without source code → India <b>cannot modify or upgrade independently</b> → limits strategic autonomy.               |
| <b>Software-Defined Warfare</b>                | Modern fighter jets rely heavily on software for sensors, radar, and combat systems.                                 | Control over <b>software = control over capability</b> → new dimension of warfare.                                   |
| <b>Diversification of Defence Partners</b>     | India exploring options like <b>Russia's Su-57</b> , while maintaining ties with US, France, Israel.                 | Reduces dependency on one country → improves bargaining power.   |
| <b>Indigenous Defence Development</b>          | India developing <b>HAL Tejas, Tejas Mk2, AMCA</b> .   | Long-term goal → <b>self-reliance (Atmanirbhar Bharat in defence)</b> .  |
| <b>IAF Squadron Gap</b>                        | Current strength: <b>29 squadrons vs required 42</b> .   | Urgency behind new procurement → defence preparedness issue.   |
| <b>Cloud Infrastructure as Strategic Asset</b> | Data centres and cloud systems are now critical infrastructure.  | Warfare targets shifting from <b>oil &amp; power</b> → <b>digital systems</b> .                                      |



|                                     |  |  |
|-------------------------------------|--|--|
| <b>Cyber / Digital Warfare Risk</b> | Attacks on cloud systems can disrupt military ops, payments, logistics.                          | Creates <b>economic + national security risks simultaneously</b> . |
| <b>Shift in Warfare Targets</b>     | Earlier: physical assets (ports, pipelines). Now: <b>data, networks, communication systems</b> . | Reflects evolution toward <b>hybrid warfare</b> .                  |

## MAPS

### West Asia



## Persian Gulf and Strait of Hormuz

