

NDA Monthly Compendium

August 2026

Compiled from in-window PIB press releases · 62 items



THE CAVALIER

Defence Coaching Since 2001

How to use this digest

- Each entry is a **ready-to-revise note**: the **headline fact** an examiner would pin, with the static context (full form, year, ministry/body, related facts) built around it.
- Bold** marks the load-bearing detail to memorise.
- Tap any **PIB** link at the foot of an entry to open the original press release and verify or go deeper.
- Entries are grouped by theme; every figure is drawn from in-window PIB press releases.

Schemes (1)

• Vibrant Villages Programme I and II

Detail: VVP-I — approved 15 Feb 2023, a **Centrally Sponsored Scheme**, **Rs 4,800 crore**, for villages in **46 blocks** on the **northern border** (Arunachal Pradesh, Himachal Pradesh, Ladakh, Sikkim, Uttarakhand)

Detail: VVP-II — approved 2 April 2025, a **Central Sector Scheme**, **Rs 6,839 crore** till FY 2028-29, for **1,954 villages** in **334 blocks** on the **other international land borders**, across **17 States/UTs**

Detail: **2,906 projects** sanctioned and **Rs 959.66 crore** released under VVP-I; a **High-Powered Committee** under the **Cabinet Secretary** may **relax other ministries' scheme guidelines** for border villages

Exam hook: Land border **~15,106.7 km** — Bangladesh **4,096.7**, China **3,488**, Pakistan **3,323**, Nepal **1,751**, Myanmar **1,643**, Bhutan **699**, Afghanistan **106**; coastline **~7,516.6 km**. Guarding — **BSF** (Pakistan, Bangladesh), **ITBP** (China), **SSB** (Nepal, Bhutan), **Assam Rifles** (Myanmar); **BRO** raised 1960

Polity/Bodies (1)

• Lucknow Cantonment projects and how cantonment boards work

Body: **Raksha Mantri Rajnath Singh** and UP CM **Yogi Adityanath**; **Bhoomi Pujan** for **14 projects worth over Rs 100 crore**, two with the state government

Detail: Projects include an **AI-based solid waste plant**, a **1,500 KL underground reservoir**, **eight tubewells with SCADA**, a special school for differently abled children, **multi-level robotic car parking** and **legacy waste bio-mining** — all recognisably **municipal functions**

Detail: A **cantonment** is a notified **civil-military** area with a substantial **civilian population**; a **military station** is purely military. That is why a municipal-style body is needed inside a defence estate

Lineage: Governed by the **Cantonments Act, 2006** (replacing 1924) under the **Ministry of Defence** through the **Directorate General Defence Estates**. The **Station Commander** is **ex-officio President**; the **CEO** comes from the **Indian Defence Estates Service**; composition is **partly elected**, partly nominated

Exam hook: **Cantonment boards fall outside the 74th Amendment** — they are **statutory**, not constitutional bodies under Part IXA, and their functions are not in the **Twelfth Schedule**. The live debate is **excising civilian areas** into adjoining municipalities

Economy (1)

• India's coal — output growth and commercial mining

Body: Ministry of Coal

Detail: July 2026 production rose 7.51% year-on-year to 69.75 MT with dispatch up 17.34% to 86.33 MT; India holds the world's fifth-largest coal resource and is the second-largest producer and consumer, coal meeting close to 55% of primary energy and over 70% of electricity; after the Supreme Court cancelled 204 of 218 blocks in 2014, the Coal Mines (Special Provisions) Act, 2015 restored auctions and commercial mining was launched on 18 June 2020

Exam hook: Coal ranks rise peat, lignite, bituminous, anthracite; about 98% of reserves are Gondwana coal of the Damodar, Son, Mahanadi and Godavari valleys — Jharia the largest coking field, Raniganj where mining began in 1774; lignite at Neyveli

IR/Diplomacy (1)

• Inaugural India-Kuwait Joint Defence Committee

Body: Co-chaired by **Joint Secretary Amitabh Prasad** and **Brigadier General Raed Alsakran**, New Delhi; Indian side included the three Services, **DDP**, **DRDO**, **Armed Forces Medical Services** and **MEA**
Detail: Agreed areas — **training, military exercises, military medicine, staff talks, defence industry and R&D**. Wreath at the **National War Memorial**; industry talks at **DPSU Bhawan**

Detail: A **JDC** is the **institutional mechanism** that operationalises an MoU. The progression runs **diplomatic relations** → **MoU (intent)** → **joint committee (process)** → **activities** → **deeper agreements**. Without a mechanism an MoU has no owner

Lineage: Relations established 1962; upgraded to a **Strategic Partnership** during the PM's visit in **December 2024**, when the defence MoU was signed. The **Gulf rupee**, issued by the **RBI from 1959**, was legal tender in Kuwait

Exam hook: The **1990 Iraqi invasion** prompted the **largest civilian airlift in history**, evacuating over a lakh Indians. Gulf exercises: **UAE Desert Cyclone/Desert Eagle** · **Saudi Al-Mohed Al-Hindi** · **Oman Al Najah**, **Naseem Al Bahr**, **Duqm access** · **Qatar Za'ir-Al-Bahr**

Defence (29)

• The President's Bodyguard and the PBG Soldierathon

Body: President's Secretariat

Detail: The President flagged off the **PBG Soldierathon** at Rashtrapati Bhavan, raced at the **Cariappa Parade Ground** in 3, 5 and 10 km categories, with proceeds supporting the **Paraplegic Rehabilitation Centre** and wards of battle casualties; the President's Bodyguard is the **Indian Army's** senior-most regiment, raised in September 1773 as the **Governor-General's Bodyguard** by **Warren Hastings** from 50 troopers of the **Moghul Horse**, and marked 250 years in 2023

Exam hook: Its troopers are horsemen, tank crew and paratroopers; the President is **Supreme Commander** under Article 53(2); **Cariappa** was the first Indian C-in-C (1949) and **Manekshaw** the first **Field Marshal** (1973)

• Agni-4 test-fired: ballistic missiles & the nuclear triad

Detail: **Agni-4** — **MRBM**, **~4,000 km**, **two-stage solid-fuelled**, road-mobile, **~1,000 kg** payload; test-fired **6 Aug 2026** from **ITR Chandipur, Odisha**, under the **Strategic Forces Command**

Detail: Agni ranges — **1 (~700 km)**, **2 (~2,000)**, **3 (~3,000)**, **4 (~4,000)**, **5 (5,000+)**, plus **Agni-P**

Detail: **Ballistic** = rocket-powered, unpowered arc, exits the atmosphere; **cruise** = jet-powered, low-flying, manoeuvrable (**BrahMos**, **Nirbhay**)

Exam hook: The **triad** — **Agni** (land), **Su-30MKI/Rafale/Mirage-2000** (air), **Arihant-class SSBN** with **K-15/K-4** (sea, **most survivable**). **NCA (2003)** — Political Council chaired by the **PM** authorises use, Executive Council by the **NSA**. **IGMDP (1983)** under **A.P.J. Abdul Kalam**

• The Andaman & Nicobar Command

Detail: Created **2001**, HQ **Port Blair** — **India's first and only tri-service theatre command**, led by **CINCAN** (three-star, customarily Navy)

Detail: Tasks — island defence, **EEZ patrol**, anti-piracy and anti-smuggling, **HADR**, **CORPAT** with **Indonesia and Thailand**, exercises with **Singapore**

Detail: **Indira Point** on Great Nicobar is **India's southernmost point**; the **Ten Degree Channel** separates Andaman from Nicobar; the **Six Degree Channel** separates Great Nicobar from **Sumatra**; **Barren Island** is **India's only active volcano**

Exam hook: The islands command the **western approaches to the Malacca Strait**. Renamings — **Ross** = **Netaji Subhas Chandra Bose Dweep**, **Neil** = **Shaheed Dweep**, **Havelock** = **Swaraj Dweep**. **Cellular Jail** at Port Blair

• Operation Sindoor & the logic of deterrence

Detail: **Deterrence** = persuading an adversary **not to act** — by **punishment** (threatened retaliatory cost) or by **denial** (making success impossible); it requires **capability** + **credibility** + **communication**
Detail: **Compellence** forces an adversary to **undo** an action, and is **harder than deterrence** — the distinction most worth carrying into an interview
Detail: The escalation ladder runs **sub-conventional** → **conventional** → **nuclear**, and **escalation control** is the central skill; **grey-zone** operations use cyber, information, economic and drone means **below the war threshold**

Exam hook: **CCS chaired by the PM** is the apex security body, supported by the NSC and NSA; the **CDS since 2020** heads the **Department of Military Affairs**. Intelligence — **IB** internal, **R&AW** external, **DIA** military, **NTRO** technical, **NIA** investigation

• CNS visits Mauritius: SAGAR to MAHASAGAR

Detail: Admiral Krishna Swaminathan, 27th Chief of the Naval Staff (charge **31 May 2026**), visited Mauritius **10-13 August 2026**

Detail: Cooperation with the **Mauritius National Coast Guard** — training, **joint EEZ surveillance**, port visits, hydrographic surveys. Mauritius takes part in **IONS (2008)**, **MILAN (from 1995)**, the International Fleet Review, the **Goa Maritime Conclave**, **IOS SAGAR** and **Exercise AIKEYME** (inaugural **April 2025**, off **Dar es Salaam**, with Tanzania)

Detail: Both doctrines were announced from Mauritius — **SAGAR** (Security and Growth for All in the Region) on **12 March 2015**, and **MAHASAGAR** (Mutual and Holistic Advancement for Security and Growth Across Regions) in **March 2025**

Exam hook: Mauritius — capital **Port Louis**, **EEZ ~2.3 million sq km**, **~70% of Indian origin**; **CECPA** (22 Feb 2021, effective 1 Apr 2021) is **India's first trade agreement with an African country**. Chokepoints — **Hormuz**, **Bab-el-Mandeb**, **Malacca**, **Mozambique Channel**; **IFC-IOR** at **Gurugram**

• NGOPV 'Shruti' launched at GRSE

Detail: **Yard 3037**, named **Shruti**, a **Next Generation Offshore Patrol Vessel**, launched at **GRSE Kolkata** on **11 August 2026** by Mrs Manika Sadhu, in the presence of **Vice Admiral Sanjay Sadhu**, Controller of Warship Production & Acquisition

Detail: **11 NGOPVs** contracted **March 2023** — **seven at Goa Shipyard (lead yard)** and **four at GRSE (follow yard)**; indigenously designed; roles — maritime surveillance, SAR, protection of offshore assets, **HADR**, anti-piracy

Detail: **Shruti** refers to the **four Vedas** (as distinct from **Smriti**); the crest carries **Ursa Major** and a lighthouse

Exam hook: The build sequence — **steel cutting** → **keel laying** → **launch (the ship is NAMED here; until then it is a yard number)** → **fitting out** → **sea trials** → **commissioning (only then does it carry INS)**. Yards — **MDL Mumbai**, **GRSE Kolkata**, **GSL Goa**, **HSL Visakhapatnam**, **CSL Kochi** (built **INS Vikrant**). **UNCLOS** — 12/24/200 nm, via the **Maritime Zones Act 1976**

• GARUD binoculars and the optics of the OFB reorganisation

Detail: **India Optel Limited**, a **Mini Ratna Category-I DPSU**, launched the indigenous **GARUD** binoculars for the civil market on **13 Aug 2026**; made at **Ordnance Factory Dehradun**, whose optical legacy dates to **1943**. Specs — **8x magnification**, field of view **7.6°**, diopter **±5**, **~610 g**

Detail: The **Ordnance Factory Board** was dissolved on **1 October 2021** and its **41 factories** reorganised into **seven DPSUs** — **Munitions India**, **Armoured Vehicles Nigam**, **Advanced Weapons and Equipment India**, **Troop Comforts**, **Yantra India**, **India Optel**, **Gliders India**

Detail: In **8×42**, the **first figure is magnification and the second the objective diameter in mm**. **Magnification = objective focal length ÷ eyepiece focal length**; **exit pupil = objective diameter ÷ magnification**
Exam hook: **Dioptre = reciprocal of focal length in metres** — **positive** (converging) corrects **hypermetropia**, **negative** (diverging) corrects **myopia**. Prisms **erect the image and fold the path by total internal reflection** — the same principle as **optical fibre** and **mirages**. **PSU tiers** — **Maharatna**, **Navratna**, **Miniratna I and II**

• Gallantry awards on the eve of the 80th Independence Day

Detail: President **Droupadi Murmu** approved **78 gallantry awards** including **13 posthumous**, plus **89 Mention-in-Despatches** — **9 Kirti Chakra** (7 posthumous), **1 Bar to Shaurya Chakra**, **19 Shaurya Chakra**, **5 Bars to Sena Medal**, **36 Sena Medal** (**Gallantry**), **3 Nao Sena Medal**, **5 Vayu Sena Medal**; **1,057** police, fire, home guard, civil defence and correctional personnel also decorated

Detail: **Wartime series** (in the presence of the enemy) — **Param Vir Chakra**, **Maha Vir Chakra**, **Vir Chakra**. **Peacetime series** — **Ashoka Chakra**, **Kirti Chakra**, **Shaurya Chakra**. All six instituted **26 January 1950**, effective **15 August 1947**; the peacetime three renamed from **Ashoka Chakra Class I/II/III** in **1967**

Detail: **Combined order of precedence:** **PVC** → **Ashoka Chakra** → **MVC** → **Kirti Chakra** → **VrC** → **Shaurya Chakra** — they interleave
Exam hook: The **PVC** was designed by **Savitri Khanolkar** and first awarded **posthumously to Major Somnath Sharma**, **4 Kumaon**, for **Badgam (1947)**. A **Bar** = a second award of the same decoration. The President is **Supreme Commander under Article 53(2)**; **Article 18** exempts **military and academic distinctions** from the abolition of titles

• Loiter Munition Systems contracted for the Artillery

Detail: MoD signed with **TATA Advanced Systems** and **NIBE Pvt Ltd** on **14 Aug 2026** for **Loiter Munition Systems**, **~Rs 1,577 crore**, for the **Indian Army**, under **Buy (Indian)** through the **Fast Track Procedure**

Detail: A **loitering munition** is launched **before the target is confirmed**, **loiters** over the area, then **dives onto the target and detonates its own warhead** — fusing the persistence of a **UAV** with the strike role of a **missile**; it **collapses the sensor-to-shooter chain**, allows **man-in-the-loop abort**, and offers a favourable **cost exchange**

Detail: **DAP 2020** categories in descending order of indigenous preference — **Buy (Indian-IDDM)** → **Buy (Indian)** → **Buy and Make (Indian)** → **Buy (Global – Manufacture in India)** → **Buy (Global)**. **IDDM** requires **Indian *design***, not merely **Indian manufacture**

Exam hook: The **Regiment of Artillery** is the Army's second-largest arm, motto **Sarvatra Izzat-o-Iqbal** — fields **Dhanush**, **ATAGS**, **K9 Vajra-T**, **M777**, **Pinaka**, **BrahMos**. Indian loitering munitions in service — **Nagastra-1** and **SkyStriker**

• Raksha Shakti: the defence agenda of the 80th Independence Day address

Detail: **Defence power** is the fifth of the seven **Sapt Dhara** streams. Stated priorities — **next-generation defence technologies**, becoming a **global defence supplier**, **drones** and **counter-drone systems**, **hypersonics**, and **cybersecurity**

Detail: **Defence exports up nearly 50-fold**, reaching about **100 countries**; **production up nearly 4-fold in 12 years**; **Mission Sudarshan Chakra** progressing rapidly

Detail: **Naxalism** held areas for **four decades** at a cost of **more than 3,500** police and security personnel; **armed Naxalism is described as defeated**, though the **mindset persists**; a **vibrant civil defence network** is to be built

Exam hook: **Hypersonic = Mach 5 and above**, via **rocket-boosted glide vehicles** or **scramjet-powered cruise missiles**; hard to intercept because they fly **lower**, manoeuvre, and compress decision time. **Counter-UAS** spans **detection** (radar, RF), **soft kill** (RF jamming, **GNSS spoofing**) and **hard kill** (interceptors, **directed-energy weapons**)

• COAS visits Nepal and the honorary General tradition

Detail: General **Dhiraj Seth**, **COAS**, visited **Nepal 17-19 August 2026** — wreath at the **Army Pavilion, Tundikhel**; briefing by the **DGMO, Nepali Army**; **Investiture Ceremony** at **Rashtrapati Bhawan**, where President **Ram Chandra Paudel** conferred the **Honorary Rank of General of the Nepali Army**; address at the **Army Command and Staff Course**, **Shivapuri**; **Ex-Servicemen Rally** at **Pokhara**

Detail: The reciprocal honorary rank dates from **1950**, when **General K.M. Cariappa** was the first recipient; **India first reciprocated in 1969**. It attaches to the **office**, and has run unbroken for **76 years**

Detail: **Foundations** — **Sugauli Treaty 1816**; **Tripartite Agreement 1947** (**India-Nepal-Britain**, on **Gorkha** service); **Treaty of Peace and Friendship 1950** (open border). Border **~1,751 km**, **open**, guarded by the **SSB**; **Nepal is landlocked**

Exam hook: **Exercise Surya Kiran** is the **India-Nepal joint exercise**, held alternately, begun **2011** at **Vairengte**; **18th edition** at **Saljhandi**, **January 2025**. **Gorkha recruitment has been on hold since 2022** over **Agnipath**, which **Nepal** views as inconsistent with the **1947** framework. The relationship is called '**Roti Beti Ka Rishta**'

• Exercise MAITREE-XV with Thailand

Body: Indian contingent departed 17 August 2026; exercise 18–31 August at Vibhavadi Rangsit Camp, Surat Thani, Thailand. The 15th edition; instituted 2006; previous edition at Umroi, Meghalaya, September 2025
Detail: 85 personnel each side — India represented primarily by 9 Gorkha Rifles, Thailand by the 3rd Battalion, 25th Infantry Brigade, 5th Division. Company-level training

Detail: Focus is counter-insurgency and counter-terrorist operations in jungle and semi-urban terrain under Chapter VII of the UN Charter. Jungle compresses engagement ranges and degrades radio under canopy; semi-urban adds vertical space and makes discrimination the hardest skill.

India's centre of excellence is CIJWS, Vairengte, Mizoram
Lineage: Thailand is a founding ASEAN member (HQ Jakarta), in BIMSTEC (Secretariat Dhaka) and Mekong-Ganga Cooperation; it shares a maritime boundary with India in the Andaman Sea, astride the approaches to Malacca. Naval engagement via Indo-Thai CORPAT and MILAN

Exam hook: Chapter VI is pacific settlement, not enforceable; Chapter VII allows sanctions (Art 41) and force (Art 42) and is binding. Classical peacekeeping is consent-based — 'Chapter VI and a half'

• India leases two MQ-9B Sea Guardian HALE drones

Body: MoD signed with General Atomics Aeronautical Systems (GA-ASI) for the Indian Navy — two MQ-9B Sea Guardian RPAS on a 30-month lease at about Rs 1,943 crore

Detail: Purpose is Maritime Domain Awareness — persistent ISR over the Indian Ocean Region

Detail: The vocabulary — HALE = High-Altitude Long-Endurance (above ~40,000 ft, 30–40+ hours) · MALE = Medium-Altitude · RPAS includes the ground control station, datalinks and payloads, not just the airframe

Lineage: Altitude widens the sensor footprint because the horizon recedes; endurance buys persistence — a pattern rather than a snapshot. A ship's radar horizon is limited by the Earth's curvature; a HALE platform is not

Exam hook: The scale of the task — coastline about 7,516.6 km, EEZ roughly 2.37 million sq km, about 95% of India's trade by volume moving by sea, with chokepoints at Hormuz, Bab-el-Mandeb, Malacca and the Mozambique Channel. The rest of the architecture: IFC-IOR at Gurugram, the coastal radar chain, and P-8I Poseidon

• Sixth Positive Indigenisation List: 405 items

Body: Department of Defence Production; 405 items, business potential about Rs 3,070 crore — 389 DPSU items and 16 Indian Coast Guard items, covering LRUs, sub-systems, sub-assemblies, spares, components and raw materials

Detail: The point most often missed — a 'Positive' Indigenisation List is in substance a negative import list. After an indicative timeline the item may not be imported and must come from Indian industry. The timeline breaks a chicken-and-egg problem by giving industry advance notice and the Services certainty

Detail: The first five lists covered 5,012 items; the sixth takes the total past 5,400. Contents include ALH, LUH, Su-30MKI, LCA, the AL-31FP engine, T-72, T-90, BMP-II, warships, Konkurs-M, Invar, MRSAM, radars, sonars and HEAT ammunition

Lineage: Import dependence bites at the level of the LRU and the spare, not the platform — a fleet assembled in India can still be strategically dependent if the spares pipeline runs abroad. The AL-31FP entry is the textbook case

Exam hook: The SRIJAN portal (DDP, August 2020) has offered over 33,000 items, with over 15,700 indigenised and import substitution of about Rs 9,000 crore over five years

• Japan's Defence Minister at Western Naval Command

Body: Japanese Defence Minister Shinjiro Koizumi, on his maiden India visit, at Western Naval Command, Mumbai; met CNS Admiral Krishna Swaminathan and FOC-in-C Vice Admiral Sanjay Vatsayan; visited INS Chennai. Talks with Raksha Mantri Rajnath Singh followed on 20 August

Detail: The substantive hook — Japan's revision of its Three Principles on Transfer of Defence Equipment and Technology. 1967: Three Principles on Arms Exports, a near-total ban rooted in Article 9. 1 April 2014: replaced by the Transfer principles with case-by-case screening.

April 2026: comprehensive revision abolishing the five non-lethal categories restriction

Detail: The ceiling on India-Japan defence trade was Japanese domestic law, not intent — the long-discussed US-2 amphibious aircraft is the standing example

Lineage: INS Chennai is a Kolkata-class destroyer, Project 15A, built at Mazagon Dock, commissioned 2016, carrying BrahMos and Barak-8

Exam hook: Naval commands — Western Mumbai · Eastern Visakhapatnam · Southern Kochi (training), plus tri-service Andaman and Nicobar, Port Blair. India-Japan exercises: JIMEX (navy), Dharma Guardian (army), Veer Guardian (air), plus Malabar

• 25th India-UK Defence Consultative Group

Body: New Delhi; co-chaired by Defence Secretary Rajesh Kumar Singh and UK Permanent Under Secretary Jeremy Pocklington, his first India visit in that role

Detail: The DCG was constituted in 1995, meets at Defence Secretary / PUS level, alternates between New Delhi and London, and has sub-groups on military-to-military contacts, defence equipment and science and technology. India has no 2+2 ministerial with the UK — the DCG carries the relationship

Detail: Two frameworks, both signed 24 July 2025 in London — India-UK Vision 2035 and a Ten Year Defence Industrial Roadmap covering jet engines, maritime security, underwater systems and directed energy weapons

Lineage: CETA signed 24 July 2025, in force 15 July 2026, making 99% of Indian tariff lines duty-free in the UK. Exercises: Ajeya Warrior (8th edition, November 2025) and Indradhanush (since 2006). IPOI launched 4 November 2019 at the East Asia Summit, with the UK co-leading the maritime security pillar

Exam hook: The trap — Rolls-Royce has offered an AMCA engine with full IP transfer but has not won the contract; Safran, GE and IHI remain in contention. The honest line: architecture is dense, but the UK supplies only about 3% of India's defence imports against Russia's 36%

• Terrier Cyber Quest 3.0 and the Territorial Army

Body: Territorial Army with CyberPeace; registration closed 31 August, Grand Finale New Delhi, 6–8 October, awards 9 October 2026 — Territorial Army Day

Detail: Three tracks — Bug Hunting (CTF qualifier into a live sandbox on simulated critical infrastructure) · AI Kavach (predictive threat intelligence and anomaly detection) · Creators Challenge (deepfakes, phishing, misinformation), which is new. TCQ 2025 had two tracks and about 10,000 participants

Detail: What the Territorial Army is not — not a career, not an occupation, and not the Army's reserve of ex-regulars. It is a part-time citizens' force and India's second line of defence; gainful civil employment is a prerequisite, age 18–42, graduate, with about two months training a year

Lineage: Territorial Army Act, 1948; first camp inaugurated 9 October 1949 by C. Rajagopalachari; motto Savdhani Va Shoorta — Vigilance and Valour. Structure: ~65 departmental units, ~32 Infantry Battalions, Ecological Task Force battalions and Engineer Regiments

Exam hook: The cyber architecture — Defence Cyber Agency (approved 2018, activated 2019, reports to the CDS via HQ IDS) · CERT-In under Section 70B, IT Act 2000 (MeitY) · NCIIPC under Section 70A, a unit of NTRO

- Mangrol delivered: India's shallow-water submarine hunters**
Body: Mangrol, the third ASW-SWC built by Cochin Shipyard Limited, delivered to the Navy on **21 August 2026**
Detail: The programme covers **16 ASW-SWC** under two contracts of about **Rs 6,311 crore** each, signed **April 2019** — **GRSE Kolkata builds the *Arnala* class (8) and CSL Kochi the *Mahe* class (8)**, replacing four Soviet-origin **Abhay-class** corvettes
Detail: Specifications — **78 m**, beam **11.36 m**, about **900 tonnes**, **25 knots**, endurance **1,800 nautical miles**, crew **57**, over **80% indigenous content**, **waterjet** propulsion
Lineage: Roles are underwater surveillance, **coastal ASW**, **Low Intensity Maritime Operations (LIMO)** and **mine warfare**. **INS Arnala** was commissioned **18 June 2025**, **INS Mahe** (first CSL hull) **24 November 2025**, **INS Malvan** **July 2026**
Exam hook: The name revives an earlier **INS Mangrol** minesweeper; *Mangrol* is a coastal town in **Junagadh district, Gujarat**. Keep the two classes and their yards straight — **Arnala/GRSE** against **Mahe/CSL**
- Siliguri Corridor security review at Sukna**
Body: Union Home Minister reviewed **Siliguri Corridor** security at **Sukna**, with **MHA, MoRTH, Army, BSF, SSB, RPF** and the West Bengal Chief Secretary, DGP and Chief Minister; presentation by the **MAC's Standing Focus Group on Siliguri Corridor**
Detail: The corridor is **20–22 km wide**, about **200 km long**, roughly **12,200 km²**, and is the sole land link to **eight** north-eastern states. **NH-27** running through it is **3,507 km**, India's second longest after **NH-44**
Detail: The doctrine articulated was a **quadrangular approach** — border guarding forces, State police, civil administration and the local community as **equal stakeholders**
Lineage: Borders in the neighbourhood — **Bangladesh 4,096.7 km** (2,217 km in West Bengal) · **Bhutan 699 km** · **Nepal 1,751 km**. **SSB raised 1963; Sikkim became the 22nd State** by the **36th Amendment, 1975 (Article 371F)**; **MAC created December 2001**; **Doklam** ran **73 days, 16 June–28 August 2017**
Exam hook: The standard distractor — **SSB guards Nepal and Bhutan; BSF guards Bangladesh**. Second trap: the corridor lies in **West Bengal**, not **Assam** or **Sikkim**
- 9th National Security Strategies Conference**
Body: Intelligence Bureau; inaugurated by Union Home Minister **Amit Shah**, New Delhi, **24–25 August 2026**, hybrid, **850+ participants**
Detail: Day 1 — counter-terrorism, intelligence fusion via **MAC**, a **narcotics vision document**, illegal-migrant detection, cyber-crime and proxy warfare. Day 2 — **sub-aerial systems**, blue economy, **information warfare**, bio-security
Detail: Directions included **PRAHAAR** training, bringing fugitives back with **trial in absentia**, integrated **UAPA** investigation and **AI analysis of MAC data**
Lineage: **IB 1887** (renamed 1920; **R&AW** split off 1968) · **Assam Rifles 1835**, the oldest · **CRPF 1939**, **CRPF Act 1949** · **NSG raised 1984**, **NSG Act 1986** · **MAC December 2001** · **NIA Act 2008**
Exam hook: **Public order = State List Entry 1; police = Entry 2**, subject to **Union List Entry 2A**, inserted by the **42nd Amendment (not the 44th)**. **Article 355** = Union's duty to protect States. **BNSS Section 356** allows in-absentia trial of a proclaimed offender **90 days after charge**
- Operation Black Hawk: 18.64 kg heroin seized**
Body: **Central Bureau of Narcotics**, MP and UP Units, Ministry of Finance
Detail: **18.64 kg** crude heroin on the **Sultanpur–Lucknow highway**, night of **20–21 August 2026** — **~16.5 kg** in a fabricated **fuel-tank cavity** of an Assam-registered car, **2.16 kg** in a truck body frame near **Barabanki**. **3 arrests**; the tell was **four refuellings in 500 km**
Detail: **NDPS Act, 1985**, in force **14 November 1985**; heroin **small = 5 g**, **commercial = 250 g**; commercial attracts **10–20 years**; **Section 37** twin bail bar; **Hira Singh (2020)** — the **whole mixture** counts
Lineage: **CBN HQ Gwalior**, licenses **licit opium** in **MP, Rajasthan** and **UP** under the **Single Convention, 1961**. **NCB is under Home Affairs**, created **March 1986** under **Section 4(3)**
Exam hook: The classic trap is putting the **CBN under Home** — it is **Finance**. **Golden Crescent** = **Afghanistan, Iran, Pakistan**; **Golden Triangle** = **Myanmar, Laos, Thailand**

- Nipun, second Nistar-class Diving Support Vessel**
Body: Indian Navy; built by **Hindustan Shipyard Limited, Visakhapatnam**
Detail: **Delivered 30 July 2026**, commissioning **31 August 2026** at **Naval Dockyard, Mumbai**. **INS Nistar**, the first of class, was commissioned **July 2025** — about **118 m**, **~10,000 tonnes**, saturation diving to about **300 m**, **80%+ indigenous content**, **~120 MSMEs**
Detail: **Saturation diving** works because once tissues are saturated at a pressure, extra time adds **no decompression penalty** — divers live in a pressurised chamber and decompress **once**, turning minutes of work into weeks
Lineage: Its strategic role is as **mothership for a Deep Submergence Rescue Vehicle (DSRV)**; the binding constraint in a submarine emergency is **how fast the DSRV reaches the site**
Exam hook: Shipyards — **MDL Mumbai** (destroyers, Scorpene) · **GRSE Kolkata** · **GSL Goa** · **CSL Kochi** (INS Vikrant) · **HSL Visakhapatnam**. India aims to be a **preferred submarine rescue partner in the IOR**
- INS Sudarshini at Lisbon on Lokayan 26**
Body: Indian Navy sail training ship; three-day port call at **Lisbon** concluded **25 August 2026**, after **Ponta Delgada** in the Azores
Detail: **Commissioned 27 January 2012**, built by **Goa Shipyard Limited**, based at **Kochi** under **Southern Naval Command** — about **54 m**, **20 sails**, **~1,035 sq m** of sail area. Sister ship **INS Tarangini (1997)**; both in the **First Training Squadron**
Detail: **Lokayan 26** began **20 January 2026** — about **ten months**, **~22,000 nautical miles**, **13 countries**, **18 ports**, over **200** Navy and Coast Guard trainees
Lineage: Sail training survives because it removes the machine between sailor and sea — teaching **seamanship, teamwork under physical risk** working aloft at night, and **endurance**. Major navies all keep tall ships (US *Eagle*, Russia *Kruzenshtern*, Portugal *Sagres*)
Exam hook: A tall ship is **naval diplomacy without threat** — unarmed and open to visitors. Commands: **Western Mumbai** · **Eastern Visakhapatnam** · **Southern Kochi (training)**; tri-service **Andaman and Nicobar, Port Blair**
- Hutatma Smruti Smarak at Patradevi and Goa's liberation**
Body: **Raksha Mantri Rajnath Singh** inaugurated the redeveloped memorial at **Patradevi**, with Goa CM **Dr Pramod Sawant**
Detail: **Satyagrahis** honoured by name — **Karnail Singh (Punjab)**, **Sahodra Devi (Madhya Pradesh)**, **Madhukar Damodar Chaudhary (Maharashtra)** — evidence the movement was **national, not regional**
Detail: Portuguese rule began **1510** with **Afonso de Albuquerque** and lasted **451 years**. Independence in 1947 did not touch Goa because Portugal claimed it as an **overseas province**, not a colony; **Dadra and Nagar Haveli** were liberated **1954**; **satyagrahis** were **fired upon at Patradevi on 15 August 1955**
Lineage: **Operation Vijay** launched **17 December 1961**, surrender **19 December** — a **tri-service** operation of about **36 hours**; the **IAF struck Dabolim**. **Goa Liberation Day = 19 December**
Exam hook: **12th Amendment, 1962** incorporated Goa, Daman and Diu as a UT; **statehood 30 May 1987** (25th state); **Konkani** added to the Eighth Schedule by the **71st Amendment, 1992**. Do not confuse **Operation Vijay 1961** with **Operation Vijay 1999 (Kargil)**
- T-series tank overhaul project at Jabalpur**
Body: **Raksha Mantri Rajnath Singh** and MP CM **Dr Mohan Yadav** performed the **Bhoomi Pujan** at **Vehicle Factory, Jabalpur**, a unit of **AVNL (Mini Ratna)**
Detail: **Rs 472 crore** project to overhaul **80 tanks a year**. The Army needs **230** overhauled annually; **Heavy Vehicles Factory, Avadi** does **150** — so **150 + 80 = 230**, sized exactly to the deficit
Detail: An **overhaul** is a complete strip-down and rebuild, not a repair, and usually includes upgrades. Overhaul capacity sets **serviceability** — the share of a fleet fit to fight today
Lineage: The **Ordnance Factory Board** was dissolved in **2021**, its **41 factories** reorganised into **seven DPSUs** — **Munitions India, AVNL**, **Advanced Weapons and Equipment India, Troop Comforts, Yantra India, India Optel, Gliders India**
Exam hook: **T-72 = Ajeya** · **T-90 = Bhishma** · **Arjun** = indigenous (DRDO's CVRDE). The Raksha Mantri's argument: armour is vulnerable **when used alone**, hence the **Integrated Battle Group** concept

- **First Mahila Commando Conversion Course at NSG Manesar**
Body: Marked by WCD Minister Smt Annpurna Devi; NSG Training Academy, Manesar
Detail: Women from State Police Forces and CAPFs train in weapons, tactical intervention, hostage rescue and counter-terrorism
Detail: A conversion course takes already-trained soldiers or police and makes them commandos — close-quarter battle, room intervention, method of entry. It is **not basic training**
Lineage: NSG raised 1984, NSG Act 1986, modelled on GSG 9 and the SAS; personnel are the **Black Cats**. **Special Action Group** comes from the Army; **Special Ranger Groups** from CAPFs and state police — nobody is recruited directly, all serve on **deputation**
Exam hook: The NSG is under the Ministry of Home Affairs, not Defence — the commonest error in the topic. The NSG and SPG are not CAPFs. Assam Rifles alone is MHA-administered but Army-operational. NDA opened to women from 2021; first women cadets 2022
- **Defence export SOP and OGEL framework simplified**
Body: Department of Defence Production, Ministry of Defence
Detail: An OGEL is a standing one-time authorisation letting an exporter self-generate authorisations for multiple consignments — no separate licence per shipment. Three OGEL SOPs consolidated into one; validity two → three years; coverage 41 countries → all countries except negative/sensitive nations and those under UNSC sanctions or arms embargoes; item range expanded; a new provision for long-term Foreign OEM contracts
Detail: Stakeholder consultation dispensed with for non-lethal items to most destinations and for all items for international tenders and exhibitions — a deadline-driven change, since a product not shown is a product not sold
Lineage: This is a switch from a positive list (permit what is enumerated) to a negative list (forbid what is enumerated), reversing the default.
End-use and end-user controls are retained — liberalising procedure is not removing scrutiny
Exam hook: Exports cut unit cost for India's own forces by spreading fixed development costs over longer runs, and smooth the lumpy procurement cycle. Positive indigenisation lists restrict imports — the mirror image. Compare Japan's April 2026 revision of its Three Principles
- **Operation Vajra 2.0: 66.80 lakh psychotropic tablets**
Body: Central Bureau of Narcotics, MP Unit, on intelligence from Neemuch; Ministry of Finance
Detail: 66,79,980 tablets — Alprazolam, Tramadol, Nitrazepam, Clonazepam — seized on the Chandigarh–Baddi route, 27–28 August 2026; 120 master cartons, one arrest, a truck seized; inventory took over 14 hours
Detail: This is pharmaceutical diversion, not smuggling — legally manufactured licensed medicine leaving the regulated chain.
Enforcement polices a paper trail, not a frontier
Lineage: The evidence was documentary — batch numbers and expiry dates erased, destroying traceability to the manufacturing lot; stock marked 'Not to be sold in Punjab Haryana State' moving into that region; no invoices, bilty or E-way bills
Exam hook: NDPS Act, 1985 grades punishment by small / intermediate / commercial quantity. CBN and DRI are under Finance; the NCB is under Home Affairs. India may cultivate licit opium under the Single Convention, 1961 in MP, Rajasthan and UP

- **4th Tri-Services Future Warfare Course concludes**
Body: HQ Integrated Defence Staff, coordinated by CENJOWS; four weeks at the Manekshaw Centre, New Delhi. CDS General NS Raja Subramani interacted with participants; certificates from CISC Air Marshal Tejinder Singh
Detail: Curriculum — AI, quantum technologies, cyber and cognitive warfare, information warfare, autonomous systems, operations across land, maritime, air and space, grey-zone and multi-domain operations. Methods included scenario-building and cognitive warfare simulations. 5th edition: 16 Nov–11 Dec 2026
Detail: Grey-zone operations are coercion kept below the threshold of armed conflict, defined by ambiguity. Cognitive warfare targets how the recipient thinks, distinct from information warfare's concern with content and flow
Lineage: HQ IDS created 2001 after the Kargil Review Committee; the CDS post and the Department of Military Affairs came in 2019 — India built the joint staff first and the joint commander later
Exam hook: The CDS is permanent Chairman of the Chiefs of Staff Committee. Tri-service bodies: Andaman and Nicobar Command, Strategic Forces Command, Defence Cyber Agency, Defence Space Agency, AFSOD. India has had two Field Marshals — Cariappa and Manekshaw

Environment (5)

- **Legacy waste, biomining and dumpsite remediation**
Body: Ministry of Housing & Urban Affairs
Detail: Legacy waste is old, mixed, unsegregated municipal waste piled at open dumpsites; it pollutes through leachate seeping into groundwater and methane (about 25 times more potent than CO₂) generated by anaerobic decomposition, which also causes dumpsite fires; biomining stabilises the heap with microbial bio-cultures, then excavates and screens it through trommels into bio-earth, recyclables, refuse-derived fuel and inerts
Exam hook: Solid Waste Management Rules, 2016 under the Environment (Protection) Act, 1986; segregation into wet, dry and domestic hazardous; SBM-Urban 2.0 (2021) targets garbage-free, dumpsite-free cities; hierarchy Reduce-Reuse-Recycle-Recover-Dispose
- **The Green Credit Programme & Mission LiFE**
Law: Green Credit Rules notified 12 Oct 2023 under the Environment (Protection) Act, 1986; tree-plantation/eco-restoration modality 22 Feb 2024, revised 29 Aug 2025
Body: Administrator is ICFRE, Dehradun
Detail: Green credit rewards environment-positive ACTIONS; a carbon credit = 1 tonne of CO₂-equivalent under the Carbon Credit Trading Scheme (BEE, successor to PAT) — the distinction that gets tested
Exam hook: Mission LiFE announced at COP26 Glasgow (2021), launched 2022 at Kevadia. Panchamrit — 500 GW non-fossil, 50% renewables, net-zero 2070
- **The Clouded Leopard Conservation Action Plan**
Detail: *Neofelis nebulosa*; IUCN Vulnerable; WPA 1972 Schedule I; CITES Appendix I; State Animal of Meghalaya; Clouded Leopard National Park in Sepahijala WLS, Tripura
Detail: Arboreal and nocturnal; longest canines relative to skull size; rotating ankles allow head-first descent; cannot roar — it is not a *Panthera*
Detail: Action Plan released on International Clouded Leopard Day (4 Aug 2026) under GoI-GEF-UNDP, at the 91st SCNBWL meeting at Coimbatore, with 14 priority landscapes in the North-East
Exam hook: NBWL is chaired by the PM, its Standing Committee by the Environment Minister. Protected areas — National Park, Sanctuary, Conservation Reserve and Community Reserve (the last two from the 2002 amendment)

- **An unusually thick ozone layer over the Bay of Bengal**

Detail: Indian scientists observed an ozone-rich layer at **21-23 km** over the **North Bay of Bengal** — several km **below** the usual **25-30 km** peak, within the **15-35 km** ozone layer

Detail: It lasted **more than a day** and appeared **at night as well as by day**, ruling out **photochemistry**. The cause is **horizontal transport of ozone-rich air** plus **downward motion and adiabatic compression**, consistent with the **Brewer-Dobson circulation**

Detail: Observed with the indigenous **206.5 MHz ARIES ST Radar** at **Nainital**, radars at **Haringhata, Gadanki and Kochi, ozonesondes, Aura MLS and INSAT-3DR**, under **Phase-I of NetRAD-ASMA**; published in *Earth and Space Science* (AGU)

Exam hook: **1 Dobson Unit = a layer 0.01 mm thick at STP**; global average **~300 DU**; an **ozone hole** is below **220 DU**. **Vienna Convention 1985 → Montreal Protocol 1987 → Kigali Amendment 2016 (HFCs); World Ozone Day 16 September**

- **Multi-Sectoral Central Team on Himalayan cloudbursts**

Detail: Constituted for **Himachal Pradesh** — **NDMA, CBRI Roorkee, IITM Pune, IIT Indore**, with inputs from **IMD, CWC and GSI**; assesses causes, ground conditions and long-term measures

Detail: **IMD defines a cloudburst as 100 mm or more of rain in one hour over about 20-30 sq km**

Detail: Mechanism — **orographic lifting → adiabatic cooling → latent heat release → deep cumulonimbus convection → updrafts suspend the column → collapse**. Cascade — **flash flood → debris flow → landslide → river blockage**

Exam hook: **GLOFs** arise from **moraine-dammed glacial lakes** — **South Lhonak, Sikkim (Oct 2023) and Chamoli (Feb 2021). DM Act 2005** — **NDMA under the PM, SDMA under the CM, DDMA under the Collector; Sendai Framework 2015-2030; CDRI headquartered in New Delhi**

Sci/Tech (18)

- **Magnetorheological fluids & the hybrid rheometer**

Detail: **MR fluid** = micron-sized **carbonyl-iron** particles in carrier oil; a magnetic field aligns them into chains, so apparent **viscosity rises within milliseconds** into a viscoelastic solid — **reversible and electrically controllable**

Detail: **Non-Newtonian**, behaving as a **Bingham plastic** (has a **yield stress**). **ER fluid** responds to an **electric field**; a **ferrofluid** uses nanoparticles and stays liquid

Detail: **Shear-thinning** = ketchup, blood; **shear-thickening** = cornflour suspension (**liquid armour**)

Exam hook: **Heating lowers liquid viscosity but raises gas viscosity**. Uses — dampers, brakes, clutches, prosthetics, seismic dampers, recoil control

- **India's indigenous African Swine Fever vaccine**

Detail: **ASF virus** is a large **DNA virus** affecting **domestic and wild pigs only** — **NOT zoonotic**; high fever, haemorrhages, mortality up to **~100%**; first detected in India in **2020**, worst in the North-East

Detail: Spreads by contact, contaminated pork/swill, **fomites** and **soft ticks**; survives in frozen and processed pork. Distinct from **Classical Swine Fever** (an RNA virus, for which a vaccine exists)

Body: Developed by **ICAR**, dedicated on **ICAR Foundation Day, 4 Aug 2026**; **ICAR established 16 July 1929; IVRI Izatnagar, NIHSAD Bhopal; WOAHS sets standards**

Exam hook: Vaccine types — live-attenuated, inactivated, subunit/toxoid, vector, mRNA. **DIVA** distinguishes infected from vaccinated animals

- **The Deep Ocean Mission & Matsya-6000**

Body: Deep Ocean Mission launched **2021**, **Ministry of Earth Sciences**, six verticals

Detail: **Matsya-6000** is a human submersible for **3 crew to 6,000 m** under the **Samudrayaan** mission, built by **NIOT Chennai**, with a **titanium spherical** crew module; wet harbour trials at **8 m** at **Kattupalli** in early **2025**

Detail: Pressure rises **~1 atmosphere per 10 m**, so **~600 atm** at **6,000 m**. Ocean zones — epipelagic, mesopelagic, bathypelagic, abyssopelagic, **hadalpelagic**; **chemosynthesis** at hydrothermal vents

Exam hook: Resources — **polymetallic nodules** (manganese, nickel, copper, cobalt) in the **Central Indian Ocean Basin**, polymetallic sulphides, gas hydrates, **OTEC**. India was the **first Pioneer Investor (1987)** under the **International Seabed Authority (Kingston)**

- **Space debris & ISRO's collision avoidance manoeuvres**

Detail: **LEO** is below **~2,000 km** — densest and riskiest; **20 of India's 22 active LEO satellites** are at higher risk. **ISRO performed 20 CAMs in 2025 and 9 in 2026**

Detail: Orbital speed **~7-8 km/s**, so even a **1 cm** fragment is destructive; **Kessler syndrome** = a collision cascade

Detail: **MEO** for navigation; **GEO** at **35,786 km** for communication; polar/sun-synchronous **~600-800 km** for imaging. **Graveyard orbit** for **GEO**, **deorbit** for **LEO**; debris-free missions targeted for **2030**

Exam hook: **Outer Space Treaty 1967** (no appropriation, no WMD), **Liability Convention 1972** (absolute on Earth, **fault-based** in space), **Registration Convention 1975**. **Project NETRA** and **IS40M** (Bengaluru) track objects

- **Non-animal methods — organ-on-chip & the 3Rs**

Detail: **in-vivo** = in a living organism; **in-vitro** = cells outside the body; **in-silico** = computer simulation; **ex-vivo** = tissue studied briefly outside

Detail: **New Approach Methodologies (NAMs)** — **organ-on-chip** (a microfluidic device lined with human cells), **organoids** (3D mini-organs from stem cells), 3D tissue models, in-silico toxicology. **ICMR supported 109 projects across 71 institutes**; 8 CSIR labs have capability

Detail: **NAMs complement rather than fully replace animal models** — the honest qualifier

Exam hook: **3Rs = Replacement, Reduction, Refinement** (Russell and Burch, 1959). **CPCSEA** regulates under the **Prevention of Cruelty to Animals Act, 1960**. **ICMR 1911, CSIR 1942, DBT 1986**

- **India's beam catcher for FAIR**

Detail: **FAIR** = Facility for Antiproton and Ion Research, **Darmstadt, Germany**, beside **GSI**; India is a **founding member and major shareholder**, coordinated by **Bose Institute, Kolkata**

Detail: India delivered the **first of three beam catchers**, designed by **CSIR-CMERI Durgapur**, for the **super-FRS** that produces radioactive beams; absorbs heavy-ion beams of **0.4-1.5 GeV/nucleon**, **~29 kJ** deposited in **50-100 ns**, causing **thermal shock** in graphite

Detail: An **antiproton** is the proton's antiparticle — same mass, negative charge, **annihilates** with matter ($E=mc^2$); antimatter was predicted by **Dirac**, and the **positron** was found first

Exam hook: Accelerators use **electric fields to accelerate** and **magnetic fields to steer and focus** — **dipole bends, quadrupole focuses**. Types: **linac, cyclotron, synchrotron**

- **The 'Boss Scam' & India's cyber-crime machinery**

Detail: Malware disguised as Statement of Account / MCA / RBI files on WhatsApp, SMS and email; hijacks a senior executive's WhatsApp, then instructs staff to pay **mule accounts**

Detail: **58,000+ alerted in 30 days** via SMS header **I4CMHA-G**; **10,000+ protected by geo-blocking C2 servers** through the **Sahyog Portal** **Body:** **I4C (MHA)** handles **crime** — runs **NCRP** and helpline **1930**;

CERT-In (MeitY) is the **incident-response** agency under the **IT Act 2000**; **NCHIPC** (under **NTRO**) protects **critical information infrastructure**; **Defence Cyber Agency** is tri-service

Exam hook: **Trojan** = disguised malware; **worm** = self-propagating; **ransomware** = encrypts for payment; **C2** = command-and-control. Social engineering exploits **authority, trust and urgency**

- **AI in MedTech & India's medical device sector**

Detail: "AI in MedTech" knowledge paper released **8 Aug 2026** at **India Medical Device 2026** (9th edition) by the **Department of Pharmaceuticals** with **FICCI**, setting out **five priorities** for responsible AI adoption

Law: Medical devices are regulated as "**drugs**" under the **Drugs and Cosmetics Act, 1940**, via the **Medical Devices Rules, 2017**; regulator **CDSO** under **MoHFW**, headed by the **DCGI**

Detail: Risk classes **A (low)**, **B, C, D (high — pacemakers, stents, heart valves)**; **NPPA** caps prices of **stents and knee implants**

Exam hook: Risks — data bias, **black-box opacity**, liability, privacy under the **DPDP Act 2023**, and validation of **software as a medical device**. India leads in pharma but is **import-dependent in high-end devices** — hence the **PLI** for medical devices

• **MSS+ road technology: the science of pavements**

Detail: MSS+ = Modified Mix Seal Surfacing Plus, an indigenous low-emission surfacing and maintenance technology from CSIR-CRRI New Delhi, demonstrated at Jaipur for Rajasthan
Detail: Flexible pavement = bituminous, spreads load layer by layer, depends on the subgrade, cheaper but needs frequent maintenance. Rigid pavement = cement concrete slab, carries load by beam action, costlier but longer-lived
Detail: Layers — subgrade, sub-base, base, binder, wearing course. Bitumen is the heaviest residue of fractional distillation of crude and is thermoplastic — it is NOT tar, which is coal-derived
Exam hook: Hot mix needs ~150-160°C; cold mix/emulsion works at ambient temperature — the low-emission route. PMB and CRMB (crumb rubber from waste tyres) extend life

• **National Quantum Mission: progress and targets**

Detail: Approved April 2023, outlay Rs 6,003.65 crore for eight years (2023-24 to 2030-31), under DST; Annual Quantum Conclave 10-11 April 2026
Detail: Four Thematic Hubs — Quantum Computing at IISc Bengaluru (with C-DAC), Quantum Communication at IIT Madras (with C-DOT), Quantum Sensing & Metrology at IIT Bombay, Quantum Materials & Devices at IIT Delhi; 14 Technical Groups, 17 Project Teams, 23 Quantum Teaching Laboratories, 17 startups
Detail: Targets — 50-1,000 physical qubits in eight years; satellite-based QKD over 2,000 km; inter-city fibre QKD over 2,000 km
Exam hook: Superposition means n qubits represent 2ⁿ states; entanglement correlates them; measurement collapses the state; decoherence is the main obstacle. QKD security rests on the no-cloning theorem and on eavesdropping disturbing the states; post-quantum cryptography resists Shor's and Grover's algorithms

• **A 3D model for forecasting Coronal Mass Ejections**

Detail: DST announced a three-dimensional magnetohydrodynamic simulation by the Indian Institute of Astrophysics, published in the *Astrophysical Journal*, computed on the NOVA HPC facility
Detail: The trigger of a CME is a magnetic flux rope — a twisted bundle of field lines in plasma. As it rises it stretches the overlying field; reconnection begins gradually with a thin current sheet before impulsive expulsion. Key finding: the rate of magnetic reconnection correlates monotonically with CME acceleration
Detail: Validated with NASA's HMI and AIA aboard the Solar Dynamics Observatory, using the area swept by flare ribbons as the measure of reconnected flux
Exam hook: A solar flare is electromagnetic radiation, arriving in ~8 minutes 20 seconds; a CME is matter, arriving in 1-3 days. Core ~15 million K, photosphere ~5,500 °C, corona ~1 million K (the coronal heating problem); solar cycle ~11 years, full magnetic cycle ~22. Aditya-L1 launched 2 Sept 2023 by PSLV-XL, reached halo orbit at L1 (1.5 million km) on 6 Jan 2024, seven payloads incl. VELC

• **VIHAAN on the VEGA processor: India's chip design**

Detail: MeitY announced that Aheesa Digital Innovations, a Chennai fabless startup under the Design Linked Incentive scheme, achieved first-pass silicon success with VIHAAN, a networking System-on-Chip for fibre broadband built on the indigenous VEGA processor — taped out on Republic Day, production tape-out targeted 2027; ~Rs 40 crore raised from TNIFMC
Detail: Chip design contributes up to 50% of value addition in the semiconductor chain and 15-35% of the bill of materials of electronic products
Detail: Tools provided to 455 organisations (350 academic, 105 startups); DLI firms have 35 tape-outs and raised over US\$100 million; Chips to Startup has produced 245 tape-outs from 71 institutions. Semicon 2.0 approved July 2026, outlay Rs 1,27,500 crore
Exam hook: VEGA is from C-DAC under the Digital India RISC-V programme; SHAKTI from IIT Madras — both on the open-source, royalty-free RISC-V ISA. Tape-out = despatch of a design to the foundry; first-pass silicon success = it works without a redesign. Models — fabless, foundry, IDM

• **CYBER KUSHTI 2026: a hackathon that scores judgment**

Detail: Launched by NIELIT (under MeitY) on 15 Aug 2026 as the technical track of NCCDFI 2026, with the ISAC Foundation and CERT-In as Knowledge Partner; registration to 10 September, free, teams of three
Detail: Every team gets an identical, deliberately imperfect Security Assessment Package containing false and duplicated findings, with some real vulnerabilities deliberately omitted. Teams must submit a corrected, prioritised assessment and defend it — and are rewarded for correctly rejecting false findings, not only for finding real ones
Detail: Rounds — The Akhada (online, 15 Sept, 50 teams) → The Dangal (online, 24 Sept, 10 finalists) → The Kesari (in person, 9 Oct, Dr. Ambedkar International Centre)
Exam hook: A false positive is a false alarm, a false negative a miss — both cannot be minimised at once, producing alert fatigue. CERT-In — Section 70B, IT Act 2000, under MeitY, 6-hour incident reporting; NCIIPC — Section 70A, under NTRO, for critical information infrastructure; I4C under MHA runs NCRP and helpline 1930

• **IndiaAI Mission workshop on the AIKosh datasets platform**

Body: IndiaAI Mission (MeitY) workshop at the India Habitat Centre; inaugurated by Dr Saurabh Garg, Secretary MoSPI; framing address on 'Data as National Wealth: India's Imperative for Sovereign AI' by CEO Saurabh Vijay
Detail: The four properties data must have — discoverable, understandable, interoperable and securely accessible across ministries. Interoperability is the hardest, which is why harmonisation was on the agenda
Detail: Why data rather than compute — a model is a compressed representation of its training data, so training on largely Western English text leaves gaps in Indian languages, law, crops and disease profiles that no amount of computing power fixes. That is the defensible meaning of sovereign AI
Lineage: AIKosh is the IndiaAI Datasets Platform pillar. The Mission, approved 2024, has pillars for Compute Capacity, Innovation Centre, Datasets, Application Development, FutureSkills, Startup Financing and Safe and Trusted AI. Companion mission: BHASHINI
Exam hook: It applies the DPI template — Aadhaar for identity, UPI for payments, DigiLocker for documents — to data. The limit: health records, security data and personal information stay governed by the Digital Personal Data Protection Act, 2023

• **National Space Day: Shiv Shakti Point, three years on**

Body: 23 August — National Space Day, declared 26 August 2023 and first observed 2024, so 2026 is the third edition. Theme: *Towards Viksit Bharat*; national event at Ahmedabad, presided over by ISRO Chairman Dr V. Narayanan
Detail: Chandrayaan-3 launched 14 July 2023 on LVM3-M4 from Sriharikota and soft-landed 23 August 2023 at a cost of about Rs 615 crore, making India the 4th country to soft-land and the 1st in the south polar region. Vikram lander and Pragyan rover (26 kg), designed for one lunar day ≈ 14 Earth days
Detail: Payloads — lander: ChaSTE (soil thermal profile), ILSA (seismic), RAMBHA-LP (plasma), LRA (NASA retroreflector); rover: LIBS and APXS, which made the first in-situ elemental measurements near the south pole and confirmed sulphur
Lineage: Shiv Shakti Point was announced 26 August 2023 and approved by the IAU as Statio Shiv Shakti on 19 March 2024; Chandrayaan-2's impact site is Tiranga Point
Exam hook: Why the south pole — an axial tilt of about 1.5° creates permanently shadowed regions near -175°C holding water ice, usable for drinking water, oxygen and hydrogen-oxygen propellant made on site (ISRU). Roadmap: Gaganyaan Rs 20,193 crore, crewed flight targeted 2027 · Chandrayaan-4 sample return · LUPEX with JAXA · BAS first module 2028

• CSIR-NAL unveils indigenous micro gas turbine engines

Body: CSIR-National Aerospace Laboratories, Bengaluru; chief guest **Air Marshal Tejinder Singh (CISC)**; DG CSIR **Dr N. Kalaiselvi**;

Director **Dr Abhay A. Pashilkar**

Detail: Three engines — **NJ-05 (5 kg thrust)** · **NJ-50 (50 kg)** · **NJ-100 (100 kg)** — for tactical UAVs, drone interceptors and compact missiles. Advances claimed in **high-RPM turbomachinery** and **high-temperature combustion**

Detail: A gas turbine runs the **Brayton cycle** — intake, compression, combustion at roughly constant pressure, expansion and exhaust. Thrust follows **Newton's third law**: a lot of air slowly (**turbofan**) or a little very fast (**turbojet**)

Lineage: Shrinking a gas turbine is **harder**, not easier — RPM must rise, **tip clearances grow proportionally**, and a higher surface-to-volume ratio makes stable combustion difficult. Small turbines are **not scaled-down large ones**

Exam hook: GTRE is DRDO; CSIR-NAL is CSIR — different bodies. The **Kaveri** engine missed thrust and weight targets, so **Tejas flies on an imported engine**: India now has small-engine capability while the **large-engine gap remains open**

• C-DOT unveils 14 indigenous quantum products

Body: C-DOT, the R&D centre of the **Department of Telecommunications**, released **14 indigenous quantum products** at its **43rd Foundation Day**, across **QKD** and **PQC**

Detail: The threat — **RSA** and **elliptic-curve** encryption rest on **factoring** and **discrete logarithms** being hard classically; **Shor's algorithm** on a large enough quantum computer breaks both

Detail: "**Harvest now, decrypt later**" — an adversary can **store** encrypted traffic today and decrypt it years later, so long-secrecy data is **already at risk**

Detail: **QKD** draws security from **physics** — measurement disturbs a quantum state and the **no-cloning theorem** forbids copying, so eavesdropping is **detectable**; needs **special hardware and fibre**, limited range, secures **key exchange only**

Detail: **PQC** is **classical software** cryptography (lattice-based, hash-based) believed hard even for quantum computers; runs on **ordinary computers** and covers encryption, signatures and key exchange. **PQC needs no quantum hardware** — the commonest misconception

Detail: Products include **Q-AKSHAY CD (COW and DPS protocols)** and **Q-AKSHAY MD (Measurement Device Independent protocol)**

• Cyber-Physical Systems and the NM-ICPS mission

Body: PIB backgrounder, *Cyber-Physical Systems: Foundation for a Technology-Driven Future*

Detail: A CPS links **computing with physical systems** through **sensors, software and communication networks**, uniting **computation, communication and physical processes** in a closed loop — **sense** → **compute** → **act** → **sense again**

Detail: The distinguishing test — a **computer** computes but does not act physically; a **machine** acts but does not sense and decide; an **IoT device** senses and reports; a **CPS closes the loop**

Detail: Overnight analysis is **analytics**; a decision bounded in **milliseconds** is a CPS. The engineering difficulty is guaranteeing a correct decision **within a bounded time, every time**

Detail: NM-ICPS — National Mission on Interdisciplinary Cyber-Physical Systems, implemented by the **Department of Science and Technology**, approved **2018**, outlay **Rs 3,660 crore** over **nine years**, delivered through **Technology Innovation Hubs** and **Translation Research Parks**

Infra (1)

• India's first Multi-Lane Free Flow tolling on NH-48

Body: NHAI / Ministry of Road Transport & Highways

Detail: Barrier-free tolling launched at the Chorayasi plaza on the Surat-Bharuch section of NH-48, Gujarat, with about 41,500 vehicles crossing on day one and a rollout planned at roughly 25 fee plazas; it combines ANPR cameras front and rear with high-performance RFID readers authenticating the passive, battery-free FASTag, so vehicles pay without stopping

Exam hook: Tolling ladder runs cash to FASTag ETC (mandatory 2021) to MLFF to GNSS satellite tolling by distance; NHAI Act 1988 (operational 1995); NH-44 longest; odd-numbered highways run north-south, even east-west

Culture/Sport (5)

• National Sports Awards 2025 announced

Body: Ministry of Youth Affairs and Sports, on the recommendation of a Selection Committee chaired by **Justice (Retd.) Arun Kumar Mishra**

Detail: **17 Arjuna Awards** · **1 Arjuna (Lifetime)** — **I Arumainayagam**, football · **3 Dronacharya (Regular)** and **2 Dronacharya (Lifetime)** · **Rashtriya Khel Protsahan Puraskar** to the **Army Paralympic Node, Pune**

Detail: Names most likely to be asked — **Tejaswin Shankar** (athletics), **Treesa Jolly** and **Pullela Gayatri Gopichand** (badminton), **Vidit Santosh Gujarathi** and **Divya Jitendra Deshmukh** (chess), **Lalremsiami** and **Rajkumar Pal** (hockey), **Akhil Sheoran** (shooting)

Lineage: The categories — **Major Dhyan Chand Khel Ratna** (highest, **renamed 2021**) · **Arjuna** (performance over the previous four years, with a Lifetime variant) · **Dronacharya** (coaches) · **Dhyan Chand Award** (lifetime achievement) · **Rashtriya Khel Protsahan Puraskar** (institutions) · **MAKA Trophy** (best university)

Exam hook: Para-sport and deaf sport sit inside the main list, not in a parallel honour, and the institutional award went to an **armed forces** unit. Stated honestly: the release **does not name a Khel Ratna awardee** — answer what was announced

• 65th Subroto Cup opens at Ambedkar Stadium

Body: Ministry of Defence; opened **18 August 2026** at **Dr B.R. Ambedkar Stadium**, New Delhi. Chief guest **Air Marshal S Sivakumar**, Vice Chairman of the Subroto Mukerjee Sports Education Society

Detail: **108 teams** in three categories — **Junior Girls U-17**, **Junior Boys U-17**, **Sub-Junior Boys U-15** — in **eight groups per category**. Opening match: **Meghalaya 2–0 Chandigarh** in the Junior Girls category

Detail: **Air Marshal Subroto Mukerjee** was the **first Indian Chief of the Air Staff**, from **1 April 1954**; among the first Indian cadets at **RAF Cranwell** in **1932**, the year the **IAF was raised on 8 October 1932**

Lineage: He conceived the tournament in **1958**; the Society was formed and the first tournament played in **1960**. He **died in Tokyo in 1960** before it was held, and **Jawaharlal Nehru** suggested it carry his name

Exam hook: This explains why the **IAF runs India's most important school football tournament** — it was designed as a **grassroots** tournament, not a service competition. Companion fact: the **Durand Cup (1888)** is **Asia's oldest** football tournament, also run under armed-forces aegis

• SAI Governing Body sets a talent roadmap for 2036

Body: 63rd Governing Body Meeting of the Sports Authority of India, chaired by **Dr Mansukh Mandaviya**, taking forward the PM's **Red Fort** announcement of a nationwide talent hunt

Detail: A **two-stage** model — **identify** athletes performing well at **state and district** level, then **map and assess potential**. Stage one is a **performance** filter and easy; stage two is a **potential** filter and hard, because junior results poorly predict senior results

Detail: Approved the **National Coach Accreditation Board (NCAB)** under the revamped **Khelo India** scheme, plus a **public-private partnership** model with **CSR** participation to expand academy capacity

Lineage: **SAI established 1984** to use **1982 Asian Games** infrastructure. **Khelo India** is grassroots and school sport; **TOPS** funds identified **elite medal prospects** — broad-and-shallow against narrow-and-deep

Exam hook: The arithmetic behind the policy — a **2036 medal** depends on a **twelve-year-old identified in 2026**. India has proposed **Ahmedabad** as host city. Swapping **Khelo India** and **TOPS** is the standard error

• BRICS Sports Ministers adopt a joint declaration at Visakhapatnam

Body: BRICS Sports Ministers' Meeting, **Visakhapatnam**, under India's **2026 Chairship**; a combined **Youth and Sports** ministerial chaired by **Dr Mansukh Mandaviya** with MoS **Raksha Khadse**; declaration adopted by **consensus**

Detail: Three deliverables — a Working Group on **Sports Technology** · a **Sports Manufacturing Conclave** at **Udaipur, November 2026** · **Traditional and Indigenous Sports Demonstration Games** at **Ahmedabad, 12–13 October 2026**, deliberately **non-competitive** with no medal table

Detail: India's **fourth** BRICS chairship after **2012, 2016 and 2021**; the **18th Summit** is in **New Delhi, 12–13 September 2026**

Lineage: The domestic architecture — **SAI 1984** · **TOPS September 2014**, revamped 2018 · **Mission Olympic Cell 2016** · **Khelo India** from Budget 2017-18 · **Fit India 29 August 2019**

Exam hook: The **National Sports Governance Act, 2025** (assent **18 August 2025**) creates a **National Sports Board** and a **National Sports Tribunal** with appeals to the **Supreme Court**, requires **at least 4 women** and **2 athlete representatives** on executive committees, and applies the **RTI Act** to statutory functions. **Sport is Entry 33 of the State List** — the Centre acts through funding and recognition, not a Union entry

• National Sports Day and Major Dhyan Chand's 121st

Body: Ministry of Youth Affairs and Sports; main event at the **Major Dhyan Chand National Stadium**, New Delhi, with **Dr Mansukh Mandaviya**. Theme '**Ek Ghanta Khel Ke Maidan Mein**'

Detail: Born **29 August 1905**; served in the **Indian Army (Punjab Regiment)**, rising from sepoy to **Major**. **Three Olympic golds** — **Amsterdam 1928, Los Angeles 1932, Berlin 1936** (captain in 1936); the **1932 final was 24–1** against the United States. **Padma Bhushan 1956**

Detail: The **Rajiv Gandhi Khel Ratna** was **renamed the Major Dhyan Chand Khel Ratna Award in 2021** — a **separate, older Dhyan Chand Award** exists for **lifetime achievement**

Lineage: **Fit India Movement** launched **29 August 2019**; **Khelo India** is grassroots; **TOPS** supports elite medal prospects; **SAI** established **1984** after the **1982 Asian Games**

Exam hook: **MAKA Trophy goes to a university**, not an individual. India won **eight Olympic hockey golds**, last at **Moscow 1980**; decline is associated with the shift from **grass to artificial turf**; bronze at **Tokyo 2020** and **Paris 2024** ended a **41-year drought**

THE CAVALIER
Defence Coaching Since 2001