

Steady in turbulence: On India's Australia, New Zealand ties

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 2
Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

1. What is the issue?

- Prime Minister Narendra Modi visited **Australia** and **New Zealand** to strengthen India's strategic partnerships in the **Indo-Pacific**.
- The visits highlighted India's focus on **security, defence cooperation, trade, and supply-chain resilience**.
- They are part of India's **Act East Policy, MAHASAGAR** vision, and commitment to a **free, open, and inclusive Indo-Pacific**.

MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions) is India's **global maritime strategy**, launched as an expanded version of the **SAGAR** doctrine to promote **maritime security, economic cooperation, and sustainable development** across all ocean regions.

It seeks to strengthen **global maritime partnerships, collective security, and inclusive growth**, while positioning **India** as a key maritime partner and **first responder** in the **Global South**.

2. What were the key outcomes of the India-Australia visit?

- India and Australia adopted a new **Joint Declaration on Defence and Security Cooperation**.
- Both countries agreed to strengthen cooperation in **maritime security, cybersecurity, critical minerals, and emerging technologies**.
- They also unveiled an **India-Australia Maritime**

Security Collaboration Roadmap to enhance cooperation in the **Indo-Pacific**.

- Australia agreed to **export uranium** for India's **civilian nuclear programme**.

3. What were the key outcomes of the India-New Zealand visit?

- India and New Zealand elevated their ties to a **Strategic Partnership** with a **four-year cooperation roadmap**.
- They agreed to enhance **maritime cooperation** and **mutual logistics support** between their navies.
- Both countries aim to expand **bilateral trade** and strengthen cooperation in **agriculture** following the **India-New Zealand Free Trade Agreement**.

4. Why are these visits significant for India?

- They strengthen India's partnerships in the **Indo-Pacific** amid growing **geopolitical competition**.
- They support India's efforts to diversify **supply chains**, improve **energy security**, and secure access to **critical minerals**.
- They reinforce India's objective of maintaining **strategic autonomy** through a **network of international partnerships**.

India-U.S. defence tech ties — big ambitions, little delivery

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1. How has India-U.S. defence cooperation evolved?

- India **has acquired over \$22 billion worth of U.S. defence equipment** since 2002.

- Major acquisitions include Apache and Chinook helicopters, C-17 and C-130J aircraft and P-8I aircraft
- The **U.S. has emerged as a major defence supplier to India.**
- India–U.S. defence ties **have expanded through military exercises, logistics agreements and enhanced interoperability.**
- However, meaningful co-production and technology transfer remain limited.

2. What is the significance of the GE F414 engine programme?

- The **F414 programme was unveiled during Prime Minister Narendra Modi's 2023 Washington visit.**
- It was **projected as a flagship achievement of the Initiative on Critical and Emerging Technologies (iCET).**
- The **F414 engine is linked to the Tejas Mk-II and the Navy's Twin-Engine Deck-Based Fighter programmes.**
- The estimated cost per engine has reportedly increased from ₹70–80 crore to over ₹200 crore.
- Negotiations remain complicated by disputes over technology transfer, intellectual property, export controls and production-line investment.**

3. What are the major India–U.S. defence-industrial initiatives and their outcomes?

- The **Defence Technology and Trade Initiative (DTTI), launched in 2012, aimed to promote co-development and co-production.**
- iCET, launched in 2022, covers AI, semiconductors, quantum technologies, space, biotechnology, drones and resilient supply chains.**
- INDUS-X, launched in 2023, seeks to connect defence start-ups, academia and industry.**
- Proposed collaborations involving the Javelin missile and Stryker infantry combat vehicle have remained unresolved.**
- India's 2024 acquisition of 31 MQ-9B drones for around \$3.5 billion has largely remained a procurement deal rather than full industrial collaboration.

4. Why does the technology transfer divide persist between India and the U.S.?

- India **seeks defence partnerships to acquire advanced technology and strengthen indigenous manufacturing.**
- India's objective is also **to reduce dependence on imported defence equipment** and promote Atmanirbharta.
- The U.S. treats **advanced defence technologies as strategic assets subject to stringent export controls.**
- The **International Traffic in Arms Regulations (ITAR) regulate the transfer of technical data and manufacturing know-how.**
- The **proposed Reciprocal Defence Procurement Agreement (RDPA) could expand market access** but may expose India's nascent defence industry to competition from technologically advanced U.S. defence firms.

What is meant by 'trial in absentia'?

Prelims: General Studies Paper - 1

Current events of national and international importance

Mains: General Studies - 2

Structure, organization and functioning of the Executive and the Judiciary—Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.

1. What is the case and charges against Hafiz Saeed?

- A **Special National Investigation Agency (NIA) Court** in Jammu has issued a **Non-Bailable Warrant (NBW)** against **Hafiz Saeed** (militant leader) in the **Pahalgam terror attack** case.
- The warrant was issued on **July 8** after a **supplementary chargesheet** was filed by the **NIA**.
- He is charged both individually and as chief of **Lashkar-e-Taiba (LeT)** and its proxy **The Resistance Front (TRF)-terrorist organisations**.
- Charges are under the **Bharatiya Nyaya Sanhita (BNS), 2023** and the **Unlawful Activities (Prevention) Act (UAPA), 1967**.

UAPA, 1967 India's primary anti-terror law that allows the government to declare organisations and individuals as terrorists and deal with unlawful and anti-national activities.

- The offences include **waging war against India** and **cross-border conspiracy**.

- As he is unlikely to appear, the **NIA** may seek **trial in absentia** under **Section 356 of the Bharatiya Nagarik Suraksha Sanhita (BNSS)**.

2. What is Trial in Absentia?

- Trial in absentia** means conducting a **criminal trial without the presence of the accused**.
- Under **Section 356 of the Bharatiya Nagarik Suraksha Sanhita (BNSS)**, the court can proceed if the accused is a **proclaimed offender** who has absconded.
- The absence is treated as a **waiver of the right to be present**.
- The court can conduct **inquiry, trial, and deliver judgment** as if the accused were present.
- This provision enables a **full-fledged trial** and prevents delays caused by absconding accused.

3. Whom does it apply to?

- It applies only to a **"Proclaimed Offender"** under **Section 84 of BNSS**.
- A person is declared so if they **fail to appear despite a court proclamation**.
- It is applicable only in **serious offences** punishable with:
 - ≥ 10 years imprisonment, life imprisonment, or death penalty.**
- The court declares the person a proclaimed offender after **necessary inquiry**.

4. What are the safeguards, differences from CrPC, and way forward?

- The court must issue **two arrest warrants** with at least a **30-day gap**, and publish a **public notice** giving the accused **30 days to appear**.
- The notice must be displayed at the **last known residence** and a **relative or friend must be informed**.
- The trial can begin only after **90 days from framing of charges**.
- If the accused has no lawyer, the court must provide a **defence counsel at State expense**.
- Witness statements recorded earlier** can be used, and **cross-examination may be allowed** if the accused later appears.
- Proceedings may be recorded through **audiovisual electronic means for transparency**.
- Under the **Code of Criminal Procedure (CrPC), 1973**, Sections **82, 299, and 317** allowed only **limited proceedings in absence**, not a full trial, leading to delays.
- The **Bharatiya Nagarik Suraksha Sanhita (BNSS)** introduces **complete trial in absentia (Section 356)**, ensuring **speedy justice with safeguards**.
- Effective use of this provision requires **strict adherence to safeguards, greater international cooperation for extradition, and judicial oversight** to balance **national security needs with fair trial rights**.

Old Law	New Law
IPC (Indian Penal Code, 1860) – Defined crimes and punishments	BNS (Bharatiya Nyaya Sanhita, 2023) – Replaces IPC with updated provisions
CrPC (Code of Criminal Procedure, 1973) - Procedure for investigation and trial	BNSS (Bharatiya Nagarik Suraksha Sanhita, 2023) – Replaces CrPC with new procedural framework

How the Gaganyaan crew module is built to survive

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 3
Achievements of Indians in science & technology;
indigenization of technology and developing new technology.

1. What are the key features of the Gaganyaan Orbital Module?

- Gaganyaan is **India's maiden crewed space mission, designed to carry Indian astronauts to space and return them safely to Earth.**
- The **Human-rated Launch Vehicle Mark-3 (HLVM3) will inject the Orbital Module** into the desired orbit.

The **Human-Rated Launch Vehicle Mark-3 (HLVM3)**, derived from LVM3 (GSLV Mk-III), is ISRO's heavy-lift rocket for the Gaganyaan crewed spaceflight programme and uses a three-stage configuration (solid, liquid and cryogenic stages).

- The **Orbital Module consists of a Crew Module and a Service Module connected by a joint.**
- The **Crew Module serves as the crew habitat, while the Service Module provides on-orbit support and propulsion.**
- During descent, the **Crew Module survives atmospheric re-entry and splashes down at sea, while the Service Module burns up.**

Atmospheric re-entry: The process by which a spacecraft returns from space and enters Earth's atmosphere.

2. Why does the Gaganyaan Crew Module use a sphere-cone configuration?

- A **sphere-cone configuration is a spacecraft shape combining a rounded base with a conical body.**
- A sphere **provides maximum internal volume with minimum surface area.**
- A **perfectly round (spherical) module does not create lift**, so it falls more directly and astronauts may experience strong g-forces.
- The **blunt bottom of a sphere-cone shape creates**

a shockwave that keeps much of the intense heat away from the spacecraft.

- Gaganyaan **uses a sphere-cone shape for better stability, some lift, and a safer, more controlled return to Earth.**

3. What are aerodynamic and hydrodynamic mono-stability in re-entry modules?

- Aerodynamic mono-stability** means a module maintains only one stable attitude while travelling through the atmosphere.
- Hydrodynamic mono-stability** means the module can turn itself upright and float in one stable position after landing in the sea.
- Mono-stability depends on the module's shape and centre of gravity.
- The arrangement of equipment inside the module affects its centre of gravity.
- The Gaganyaan crew module has **two distinct stable aerodynamic positions as well as two stable hydrodynamic positions.**
- Control thrusters correct its position in the air, while a gas-based up-righting system turns it upright in the sea.

4. What is dynamic instability during atmospheric re-entry?

- Dynamic instability** means the module starts shaking or swinging uncontrollably during re-entry.
- Severe **instability can make the Crew Module wobble, spin or tumble.**
- The module's stability depends on its shape, weight and the flow of air around it.
- Shaking is often strongest near the speed of sound because of shockwaves and disturbed airflow.
- Control thrusters or early parachute deployment** can help keep the module stable.

KEYWORDS

Double Contribution Convention (DCC)

- The Double Contribution Convention (DCC) is a **reciprocal social security agreement between India and the United Kingdom**.
- It was **signed on 24 July 2025, alongside the India–UK Comprehensive Economic and Trade Agreement (CETA)**.
- It **aims to prevent employees on temporary assignments from paying social security contributions in both countries**.
- **Eligible workers can remain covered under their home country's social security system** for up to five years.
- Under the DCC, **eligible Indian workers temporarily posted in the UK are exempt from the UK National Insurance system, reducing duplicate financial and administrative burdens**.

International Space Station (ISS)

- The **International Space Station (ISS)** is the **largest human-made object** to orbit the **Earth**.
- The ISS was **designed between 1984 and 1993**, with construction beginning in the **late 1980s**.
- It is a joint project of **five space agencies: NASA (USA), Roscosmos (Russia), European Space Agency (ESA), Japan Aerospace Exploration Agency (JAXA), and the Canadian Space Agency (CSA)**.
- **Russia joined the ISS programme in 1993**, making it a truly **international collaboration**.
- The ISS serves as a **microgravity laboratory**, where astronauts conduct **scientific research and technology experiments**.
- The station operates through **shared contributions**, with each partner agency responsible for managing and controlling the **hardware** it provides.

Aptamers

- **Aptamers** are in the news as researchers have combined them with **nanotechnology and machine learning** to develop **advanced protein biosensors** capable of **real-time detection of immune proteins linked to sepsis**.

- They are **short, synthetic single-stranded DNA or RNA molecules** engineered to bind **specific target proteins with high precision and selectivity**.
- Unlike **biological antibodies**, which require **animal or cell-based production systems**, aptamers are produced through **pure chemical synthesis in laboratories**.
- They are preferred in **clinical diagnostics** due to their **low production cost** and **high structural stability** (resistant to heat and mechanical stress) compared to antibodies.
- When integrated with **gene-editing tools like CRISPR**, aptamers enable **rapid detection of biomarkers** for diseases such as **malaria, SARS-CoV-2, and cancers**.

Ikkat handlooms

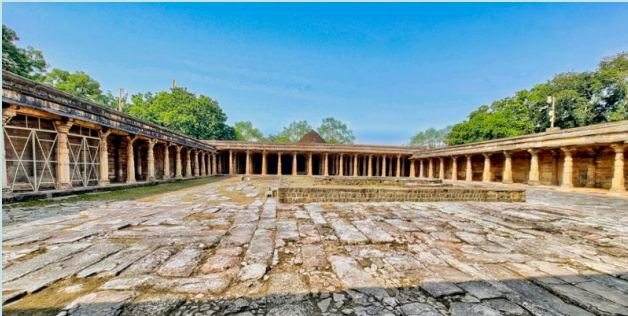
- It is a traditional **resist-dyeing technique** where yarn is tied and dyed **before weaving**, producing a distinctive **blurred geometric pattern**.
- The technique is classified into **Single Ikkat** (dyeing either **warp** [lengthwise] or **weft** [crosswise] yarns) and **Double Ikkat** (dyeing **both warp and weft** before weaving, highly complex).
- India has prominent **GI-tagged Ikkat clusters** such as **Pochampally (Telangana), Sambalpuri (Odisha), and Patan Patola (Gujarat)**.
- The craft has deep historical roots, with evidence of Ikkat-like patterns seen in the murals of the **Ajanta Caves**.



Places in News

Bhojshala–Kamal Maula Mosque complex

- The Bhojshala–Kamal Maula Mosque complex is an **ASI-protected 11th-century monument** located in Dhar, Madhya Pradesh.
- It is **historically associated with King Bhoja of the Paramara dynasty** and is believed to have been a centre of Sanskrit learning.
- The **complex contains Sanskrit and Prakrit inscriptions**, and Hindus associate the site with Goddess Vagdevi (Saraswati).
- The **site is disputed**, as Hindus claim it as the Bhojshala Temple, while Muslims identify it as the Kamal Maula Mosque.
- Recently, the **Supreme Court declined to restore Friday namaz inside the complex and directed the State to provide an open space adjacent to it for Muslims to offer Friday prayers between 1 PM and 3 PM**, as a temporary arrangement pending the final outcome of the petitions.



Personalities In News

Anil Menon

- **Anil Menon** is a **NASA astronaut** of **Kerala origin**, whose family roots trace to **Ottapalam, Palakkad district**.
- He travelled to the **International Space Station (ISS)** aboard the **Soyuz MS-29** spacecraft as part of **Expedition 74**.
 - ➔ This is **Anil Menon's first spaceflight** since being selected as a **NASA astronaut in 2021**.
- Before joining **NASA**, he served as **SpaceX's first flight surgeon**, supporting **commercial human spaceflight missions**.
- During his **eight-month mission**, he will conduct research on **semiconductor crystal production in microgravity** for applications in **high-performance computing, AI, and advanced medical devices**.
- He will also study the **effects of long-duration spaceflight** on the **human body**, including changes in **blood flow, veins, and blood composition**.
- He will conduct experiments using **ultrasound imaging, augmented reality (AR), and AI** to **reduce astronauts' dependence on medical support from Earth** during **future deep-space missions**.
- He will help test technologies to **produce intravenous (IV) fluids** using the **ISS's potable water system**, which could be vital for **future deep-space missions** where medical supplies are limited.

