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Institute of Research Based Learning & Competition

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INS VIKRANT



- It is India's first indigenously designed and manufactured aircraft carrier.
- The ship has been designed in-house by the Indian Navy's Warship Design Bureau and constructed by M/s Cochin Shipyard Limited.
- It was commissioned into the Indian Navy in 2022.
- It has an overall indigenous content of 76%.
- It strengthens the country's standing as a 'Blue Water Navy'—a maritime force with global reach and capability to operate over deep seas.
- With it, India also joined the elite group of nations—the US, Russia, France, the UK, and China—who are capable of designing and constructing aircraft carriers.
- **Features:**
 - With a length of 262 metres and a width of 62 metres, the massive aircraft carrier boasts 14 decks, making it as tall as a 14-storey building.
 - It can house over 1,500 personnel.
 - Its full-load displacement is 43,000 tonnes.
 - The ship is powered by four Gas Turbines totaling 88 MW of power and has a maximum speed of 28 knots.
 - **Endurance: 8,600 miles (13,890 kilometres)**
 - It is capable of functioning independently for up to 45 days at sea.
 - It is capable of operating an air wing consisting of 30 aircraft comprising MIG-29K fighter jets, Kamov-31, MH-60R multi-role helicopters, in addition to indigenously manufactured Advanced Light Helicopters (ALH) and Light Combat Aircraft (LCA) (Navy).
 - Using a novel aircraft-operation mode known as **STOBAR (Short Take-Off but Arrested Landing)**, INS Vikrant is equipped with a ski- jump for launching aircraft and a set of 'arrestor wires' for their recovery onboard.

WORKING OF AIR DEFENCE SYSTEMS

Air Defence System Operations

- The main goal of an air defence system is to eliminate aerial threats such as enemy fighter aircraft, drones, and missiles.
- **Components of an Air Defence System**
 - An effective system integrates radars, control centres, defensive fighter aircraft, ground-based missile and artillery units, and electronic warfare tools.
- **Key Operations of Air Defence**
 - **Detection**
 - Radars (and sometimes satellites) identify incoming threats by emitting electromagnetic waves, which bounce off objects like aircraft and return to receivers, helping determine their distance, speed, and type.
 - **Tracking**
 - After detection, threats are continuously tracked using radar and other sensors (infrared cameras, laser rangefinders). This process helps manage multiple threats in real-time and avoids friendly fire.
 - **Interception**
 - Based on the threat's nature (type, range, speed), air defence systems launch appropriate countermeasures to neutralise it.
- **Role of C3 (Command, Control, Communication)**
 - For all three operations to function seamlessly, a strong C3 system is essential.
 - It ensures quick and accurate decision-making, coordination, and execution during engagements.

Methods of Interception in Air Defence Systems

- **Fighter Aircraft (Interceptors)**
 - **Purpose:** Engage and neutralise enemy aircraft, especially bombers, before they can strike.

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- **Features:** Equipped with cannons, rockets, visual- and beyond-visual-range missiles, and electronic warfare (EW) systems.
- **Capabilities:** Fast scramble, rapid climb, agile combat.
- **Indian Examples:** MiG-21 Bison, MiG-29, Su-30MKI, HAL Tejas, Rafale.
- **Surface-to-Air Missiles (SAMs)**
 - **Role:** Primary weapon in most modern air defence systems, safer and more versatile than aircraft.
 - **Types (Unofficial Classification):**
 - **Heavy Long-Range SAMs:** Fixed/semi-mobile; e.g., S-400 (targets hundreds of km away).
 - **Medium-Range SAMs:** Mobile, quick-launch; e.g., Akash, Barak.
 - **Short-Range (MANPADS):** Man-portable; effective against drones, helicopters, low-flying jets.
 - **Guidance Systems:** Radar, infrared, or laser-guided.
 - **Deployment:** Land-based or ship-launched.
- **Anti-Aircraft Artillery (AAA)**
 - **Role:** Once dominant, now a secondary but still valuable defence against low-altitude threats.
 - **Capabilities:** Fires over 1,000 rounds per minute; shells explode at preset altitudes, creating shrapnel fields.
 - **Use Cases:** Last-ditch defence, anti-drone roles, and in environments where SAMs are less practical.
- **Electronic Warfare (EW)**
 - **Purpose:** Neutralise threats without physical destruction by manipulating the electromagnetic spectrum.
 - **Methods:**
 - Jamming enemy radars and targeting systems.
 - Disrupting guidance of missiles and drones.

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ARNALA



- ‘Arnala’ is the first of eight indigenously built Anti-Submarine Warfare Shallow Water Crafts (ASW SWCs) delivered to the Indian Navy

- It was designed and built by Garden Reach Shipbuilders and Engineers (GRSE), Kolkata, and constructed at M/s L&T Shipyard, Kattupalli, under a Public-Private Partnership (PPP).
- The warship was built according to the Indian Register of Shipping (IRS) classification rules, showcasing adherence to domestic naval architecture standards.
- The project reflects the successful collaboration between the public and private sectors in India’s defence manufacturing ecosystem, supporting strategic self-reliance.
- ‘Arnala’ is named after the historic Arnala Fort located off Vasai, Maharashtra, symbolising India’s rich maritime legacy and heritage.
- The vessel is 77 metres long and holds the distinction of being the largest Indian Naval warship powered by a Diesel Engine-Waterjet propulsion system.

Primary roles of the ship include:

- Underwater surveillance in coastal zones
- Search and Rescue (SAR) operations
- Low Intensity Maritime Operations (LIMO)
- Coastal Anti-Submarine Warfare (ASW) operations
- Advanced mine-laying capabilities.
- The induction of ASW SWCs like Arnala significantly enhances India’s shallow water anti-submarine warfare capacity, vital for maritime security in littoral zones.
- Over 80% of the ship’s components are sourced indigenously, marking a major step in the realization of ‘Aatmanirbhar Bharat’ in defence manufacturing.

UNITED NATIONS FORUM ON FORESTS (UNFF20)



- The United Nations Forum on Forests (UNFF) was established in 2000 by the UN Economic and Social Council (ECOSOC) to promote sustainable forest management and conservation

- The forum holds annual sessions at the UN Headquarters, alternating between technical discussions (odd years) and policy-level dialogues (even years).
- UNFF has universal membership, including all UN Member States and specialised forest-related agencies.
- India is a founding member of the UNFF, and continues to play a proactive role in shaping forest-related global policy.
- The 19th UNFF Session Declaration aimed to secure high-level political commitment to forest protection, with actionable steps to achieve the goals of the UN Strategic Plan for Forests (UNSPF).

India at United Nations Forum on Forests (UNFF20)

- The Indian delegation highlighted the country's achievements in forest conservation and sustainable forest management, reaffirming its commitment to the Voluntary National Contributions (VNCs) under the United Nations Strategic Plan for Forests (UNSPF) 2017–2030.
- India reported a steady increase in forest and tree cover, which now stands at 17% of its geographical area, as per the latest India State of Forest Report.
- Among the key national initiatives mentioned were:
 - Aravalli Green Wall project for land restoration,
 - A 86% increase in mangrove cover over the past decade,
 - Afforestation of over 1.55 lakh hectares under the Green India Mission, and

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- Planting of **4 billion seedlings** under the **Ek Ped Maa Ke Naam (Plant4Mother)** campaign.
- A major highlight was **India's invitation** to all **UN Member States** to join the **International Big Cat Alliance (IBCA)**, a global platform initiated by India to protect the **seven big cat species** through **collaborative research, knowledge exchange, and capacity-building**.
- These studies focused on **quantifying ecosystem services** like **carbon sequestration, water provisioning, and biodiversity conservation**, using tools such as the **System of Environmental-Economic Accounting (SEEA)** and the **Millennium Ecosystem Assessment (MEA)**.

COMPETITION COMMISSION OF INDIA (DETERMINATION OF COST OF PRODUCTION) REGULATIONS, 2025

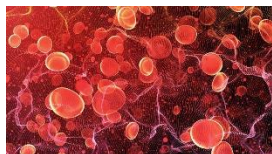


The Competition Commission of India recently notified the Competition Commission of India (Determination of Cost of Production) Regulations, 2025, aimed at effectively assessing alleged predatory pricing and deep discounting practices in the quick commerce and e-commerce sectors.

- It was **notified by the Competition Commission of India (CCI)**.
- It is **aimed at effectively assessing alleged predatory pricing and deep discounting practices** in the **quick commerce and e-commerce sectors**.
 - **Predatory pricing** refers to a strategy where a **dominant company deliberately lowers its prices** below the cost of production to **drive competitors out** of the market.
 - Once rival firms are weakened or eliminated, the company typically raises prices to recoup its losses and consolidate market control.

- This practice is specifically **prohibited** under **Section 4(2)(a)(ii)** of the **Competition Act, 2002**, when used to unfairly gain or maintain dominance.
- To strengthen oversight of such behavior, **CCI (Determination of Cost of Production) Regulations, 2025**, implements updated cost assessment standards.
- These revised benchmarks are designed to reflect modern economic thinking, judicial rulings, and international best practices in competition law.
- According to the latest regulations, the “**cost of a good or service would be assumed to be its average variable cost**”, which is the **total variable cost divided by total output** during a particular period.
 - Here, the **total variable cost refers to the total cost** (including everything that goes into the production of that good or service) **minus the fixed cost and fixed overheads** attributable to the product.
- One of the key changes in the new regulations is the **shift from sector-specific benchmarks to a case-by-case assessment** model that is flexible and adaptable to various industries, including the digital economy.
- Therefore, rather than prescribing sector-specific metrics, the framework allows for case-by-case assessment, enabling the Commission to **consider the unique features and evolving dynamics of digital markets when evaluating alleged predatory conduct**.
- These new regulations **repeal the 2009 Cost Regulations** and reflect evolving global practices in competition law.

WHAT IS THALASSAEMIA?



- Thalassemia (thal-uh-SEE-me-uh) is an **inherited blood disorder**.
- Thalassemia **causes** the body to have **less of the protein hemoglobin than usual**.
- **Hemoglobin** is present in red blood cells and **allows the red blood cells to carry oxygen**.

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- **Not having enough hemoglobin** or red blood cells can lead to a condition called **anemia**. That can make you **feel tired and weak**.
- Thalassaemia is **caused by inheriting a gene mutation** (change in the normal DNA) from one or both parents.
- There are **different types of thalassaemia**. The type someone has **depends on which gene mutation** they inherit.
- **Symptoms:** Thalassemia can cause **mild or severe anemia** and other complications over time (such as iron overload). **Symptoms of anemia include:**
 - Trouble breathing.
 - Feeling cold.
 - Pale skin
 - dizziness
 - fatigue
- **Treatments:**
 - **Blood transfusions** – regular blood transfusions treat and prevent anaemia; in severe cases these are needed around once a month.
 - **Chelation therapy** – treatment with medicine to remove the excess iron from the body that builds up as a result of having regular blood transfusions
 - The **only possible cure** for thalassaemia is a **stem cell or bone marrow transplant**, but this is not done very often because of the risks involved.

WHAT IS THE INDO-PACIFIC LOGISTICS NETWORK (IPLN)?



Quad partners recently convened at the Asia-Pacific Center for Security Studies in Honolulu, Hawaii, for a Tabletop Exercise, a simulation to launch the Quad Indo-Pacific Logistics Network IPLN.

- The Quad Indo-Pacific Logistics Network pilot project was launched during the fourth Quad Leaders' Summit in September 2024.

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- IPLN is an initiative that **enables Quad partners to leverage shared logistics capabilities** in the Indo-Pacific to **support civilian response to natural disasters** more rapidly and efficiently across the region.
- This effort will complement existing efforts with Indo-Pacific partners.
- **Together with the Indo-Pacific Partnership for Maritime Domain Awareness**, the IPLN reflects the Quad's commitment to ensuring a free and open Indo-Pacific and highlights the value of strengthening practical cooperation to address regional challenges.

What is Quad?

- The Quad, officially the **Quadrilateral Security Dialogue**, is a group of **four countries: the United States, Australia, India, and Japan.**
- **Genesis:**
 - Quad **came together during the 2004 tsunami** in the Indian Ocean region to coordinate response and assistance to countries in the region.
 - The **first meeting** of Quad officials took place on the **sidelines of the ASEAN Regional Forum summit** in the Philippines **in May 2007.**
 - After a gap of 10 years, Quad officials met in Manila in November 2017 on the margins of the East Asia Summit for consultations on connectivity issues; maritime security and counter-terrorism; shared principles for a Free and Open Indo-Pacific; and proliferation threats in Asia.
- **Since 2021, the leaders of the four nations have met annually** to drive the Quad's positive contributions across South Asia, Southeast Asia, and the Pacific.
- The core objective of the Quad is to secure a rules-based global order, freedom of navigation, and a liberal trading system.
- The coalition also aims to **offer alternative debt financing for nations in the Indo-Pacific region.**
- It is basically seen as a strategic grouping to **reduce Chinese domination.**