Prelims Exam Topics

SKYCAST SYSTEM

Context

India inaugurated its first SkyCast System at Indira Gandhi International Airport (IGI), New Delhi, under Mission Mausam to improve aviation weather forecasting

About SkyCast

- **What is it?** An integrated aviation weather monitoring and forecasting system that provides real-time atmospheric intelligence to pilots, airlines and air traffic management agencies.
- **Purpose:** Improves safety of take-offs and landings by providing advance warnings on fog, turbulence and visibility
- **Key Technologies:** Integrates Radar Wind Profiler, SODAR, Microwave Radiometer, Ground-based Fog Aerosol Spectrometer (GFAS) and Lidar-based Ceilometer.
    - **Radar Wind Profiler:** Measures wind speed, wind direction, turbulence and vertical air movement up to about 3 km altitude.
    - **SODAR (Sonic Detection and Ranging):** Uses sound waves to monitor lower-atmosphere wind patterns and turbulence.
    - **Microwave Radiometer:** Measures atmospheric temperature, humidity and water vapour profiles.
    - **Ground-based Fog Aerosol Spectrometer (GFAS):** Analyses fog droplets and aerosols to improve fog forecasting and visibility assessment.
    - **Lidar-based Ceilometer:** Uses laser pulses to monitor cloud base height, fog layers and vertical atmospheric structure.
- **Additional Uses:** Supports weather forecasting, pollution monitoring, disaster preparedness, urban weather services and AI-based decision support systems.
- **Global Status:** India became the 19th country to deploy such an advanced integrated aviation weather monitoring system.
- **Scientific Basis:** Developed using findings from the Winter Fog Experiment (WiFEX) launched jointly by IITM and IMD in 2015.

About Mission Mausam

- **Launch:** Approved by the Union Cabinet in September 2024 with an outlay of ₹2,000 crore for two years.

- **Nodal Ministry:** Implemented by the Ministry of Earth Sciences (MoES) through IMD, NCMRWF and IITM.
- **Objective:** To make India *"Weather Ready"* and *"Climate Smart"* through improved weather forecasting and climate services.
- **Key Focus Areas:** Enhancing weather forecasting, monsoon prediction, disaster warnings and climate services using advanced observation systems and high-resolution models.
- **Major Components:** Expansion of Doppler Weather Radars (DWRs), Automatic Weather Stations (AWS), rain gauges, satellites and supercomputing infrastructure.
- **Applications:** Supports agriculture, disaster management, water resources, energy, health and aviation sectors.

INDIA'S MARITIME DIGITAL REFORMS

Context

The Union Minister launched the **Logistics Port Performance Index (LPPI) for FY 2024-25** alongside four major digital governance platforms during the 37th Foundation Day of the **Jawaharlal Nehru Port Authority (JNPA).**

Core Initiatives Launched

Logistics Port Performance Index (LPPI)

- **Framework:** Developed under the national Sagar Aankalan framework and aligned with the PM Gati Shakti Master Plan.
- **Function:** Benchmarks ports across three cargo verticals: Dry Bulk, Liquid Bulk, and Container Cargo.
- **Metrics:** Evaluates real-time performance using operational indicators like vessel turnaround time, berth idle time, pre-berthing waiting time, and ship berth day output. It balances absolute performance with year-on-year improvement metrics.

24×7 e-Navik Grievance Redressal Module

- **Function:** A dedicated global welfare interface for Indian seafarers operating under high-stress conditions far from home.
- **Features:** Allows seafarers to log grievances from anywhere in the world across multi-channel streams, including the e-Navik portal, WhatsApp, dedicated emails, and international toll-free helplines.

e-Samudra Ship Registration Module

- **Function:** A major flagging reform that fully digitizes and streamlines the complex paperwork required to register commercial vessels under the Indian flag.
- **Features:** Eliminates administrative delays, matching the ease-of-business standards maintained by top global open-registry maritime nations.

Medical Practitioner Module

- **Function:** A regulatory digital portal to securely manage, register, and verify medical professionals authorized to issue fitness certificates to maritime crews.
- **Features:** Acts as a centralized database that mitigates the risk of fraudulent health certifications, ensuring only medically fit personnel board vessels.

UnifiedShip Recycling Portal (Credit Note Module)

- **Function:** Operationalizes the government's ₹70,000-crore maritime development package to boost indigenous shipbuilding.
- **Features:** Shipowners who recycle their aging vessels at Hong Kong Convention-compliant Indian yards automatically receive a digital credit note worth 40% of the ship's scrap value, which can be directly redeemed against new shipbuilding projects within India.

BABESIA INFECTION

Context

Two Asiatic lion cubs have died in **Gujarat's Gir National Park** due to a suspected **Babesia infection**, while three other lion fatalities were linked to natural causes and territorial infighting.

Definition

- Babesia infection (or Babesiosis) is a tick-borne clinical disease caused by intraerythrocytic protozoan parasites belonging to the genus Babesia (from the phylum Apicomplexa, order Piroplasmida).
- **Mechanism:** The parasites invade and multiply inside the red blood cells (erythrocytes) of the host.
- **Pathology:** Depending on the virulence of the species, the disease can cause severe direct destruction of red blood cells. Highly virulent strains can trigger hypotensive shock syndrome, generalized nonspecific inflammation, blood coagulation disturbances, and a dangerous clogging of capillaries (erythrocytic stasis).

- **Origin:** Historically identified in the 19th century—where it caused massive cattle epizootics in the US, Australia, and South Africa—the parasite's lifecycle relies on the biological intersection between blood-sucking tick vectors and susceptible vertebrate hosts.
- **Regions Found In:** The disease is distributed globally, but it is highly prevalent in tropical, subtropical, and temperate geographic zones where its specific tick vectors thrive. For instance: Cattle species (bovis, B. bigemina) are widespread in tropical/subtropical climates, while B. divergens are found in temperate zones like Europe.
- Wildlife strains actively persist in biodiversity-dense sanctuaries, such as the Gir landscape in Gujarat, India.

Symptoms of the Infection

- In both wild animals (like the Gir lion cubs) and domestic mammals, the clinical signs range from mild transient illness to rapidly fatal conditions characterized by:
    - High fever and profound physical weakness.
    - Severe respiratory distress.
    - Intravascular hemolysis (the rupture of red blood cells within the circulatory system).
    - Progressive anemia and jaundice (yellowing of tissues due to liver stress).
    - Hemoglobinuria (the excretion of hemoglobin in urine, turning it dark).

Transmission Framework

- **PrimaryTick Transmission:** Spread mainly through bites of infected hard-bodied ticks such as Rhipicephalus, Ixodes, Dermacentor, and Haemaphysalis species.
- **Transovarial Spread:** Infected female ticks can pass the parasite to their eggs, causing larvae to hatch already infected.
- **Blood-Based Transmission:** Infection may spread through contaminated blood transfusions or improperly sterilized medical equipment.
- **Vertical Transmission:** Rarely, infected mothers can transmit the parasite to offspring during pregnancy, especially in horses.
- **Zoonotic Risk to Humans:** Humans may contract the disease through infected tick bites or contaminated blood, particularly immunocompromised individuals.

Treatments and Control Measures

- **Drug Treatment:** Common anti-protozoal medicines include imidocarb dipropionate and diminazene aceturate to clear bloodstream infections.

- **Tick Vector Control:** Use of acaricides and environmental management helps reduce tick populations and animal infestations.
- **Herd Immunity Strategy:** Controlled exposure of young calves during maternal immunity stages helps develop long-term natural resistance.

SUPREME COURT SETS THREE-MONTH DEADLINE FOR RESERVED JUDGMENTS

Context

The Supreme Court of India has directed all High Courts to pronounce reserved judgments within three months. The ruling emerged from concerns over prolonged delays in delivering judgments.

What is a Reserved Judgment?

- A judgment is considered "reserved" when a court completes hearing arguments but postpones the final decision to a later date.
- Traditionally, no statutory deadline existed for pronouncing such judgments.
- Judicial practice generally expected judgments to be delivered within two to six months.

Key Directions by the Supreme Court

- **Three-Month Time Limit:** High Courts should ordinarily pronounce reserved judgments within three months. Delays beyond this period will trigger administrative review and monitoring.
- **Fast-Track Disposal of Bail Matters**: Bail applications should preferably be decided and uploaded on the same day, if reserved, the order should be pronounced by the next day.
    - Bail and sentence-suspension orders must be communicated immediately to prison authorities.
- **Timely Release of Prisoners**:Eligible undertrials and convicts should be released on the same day or by the next day after fulfilling bail conditions. This aims to prevent unnecessary detention due to procedural delays.
- **Pronouncement of Operative Orders**: In urgent matters, courts may first announce the operative portion of the judgment.
    - Detailed reasons should ordinarily be uploaded within seven days and in exceptional circumstances, the deadline may extend to fifteen days.
- **Uploading Judgments Online:** Reasoned judgments pronounced in open court should be uploaded on the High Court website within twenty-four hours. This enhances transparency and public access.

Monitoring and Accountability Mechanisms

- **Digital Tracking of Reserved Cases:** High Court websites must display the date on which judgments are reserved. Automated monthly reports must identify pending reserved matters.
- **Role of the Chief Justice:** If a judgment remains pending beyond three months, the Registrar General must inform the Chief Justice.
- **Reallocation of Cases:** Persistent non-compliance may lead to reassignment of the matter to another Bench after notifying the parties.
- **Remedies Available to Litigants:** Parties may file an application seeking pronouncement of a judgment if it remains pending beyond three months.
    - If no judgment is delivered within four months, litigants may request transfer of the case to another Bench for a fresh hearing.

NFHS-6: INDIA'S PROGRESS IN MATERNAL AND CHILD HEALTH

Context

The Ministry of Health and Family Welfare released the findings of the National Family Health Survey-6 (NFHS-6), conducted during 2023-24.

Key Highlights of NFHS-5 Vs. NHFS-6

Indicator	NFHS-5 (2019-21)	NFHS-6 (2023-24)
Improvements in Child Health and Nutrition		
Stunting (Under-5 children)	35.5%	29.3%
Severe Wasting	7.7%	5.2%
Underweight Children	32.1%	31.8%
Acute Respiratory Infection Symptoms	2.8%	1.9%
Severe Diarrhoea	Higher	0.5%
Progress Towards Universal Immunisation		
Fully Vaccinated Children (12-23 months)	83.8%	87.1%
Rotavirus Vaccine Coverage	36.4%	85.4%
Second Dose of Measles Vaccine	58.6%	71.8%
Vaccinations through Public Facilities	-	95.6%

Rise in Institutional Deliveries		
Institutional Deliveries	88.6%	90.6%
Maternal Health Indicators: Positive Trends		
Pregnant Women Receiving ANC	-	95.9%
First Trimester ANC Registration	70%	76.2%
Four or More ANC Visits	58.5%	65.2%
Fertility and Family Planning Trends		
Total Fertility Rate (TFR)	2.0	2.0
Contraceptive Prevalence Rate	66.7%	69.1%
Women's Empowerment and Social Indicators		
Women Using Internet	33.3%	64.3%
Women Owning and Using Bank Accounts	78.6%	89%
Women Using Mobile Phones	53.9%	63.6%
Hygienic Menstrual Protection Use (15-24 years)	77.6%	79.2%
Households Covered by Health Insurance	41%	60.2%

Mains Exam Topics

EROSION OF INTERNATIONAL NORMS AND THE RULES-BASED ORDER

Context

The post-World War II rules-based international order, built on institutions such as the UN, international treaties and multilateral norms, is facing increasing erosion.

Erosion of International Norms

- **Violation of Sovereignty & Territorial Integrity**: The UN Charter prohibits the use of force against sovereign states, yet major powers increasingly disregard this principle.
    - **E.g.** Russia's invasion of Ukraine (2022); U.S.–Israeli strikes on Iran (2026)
- **Weakening of Maritime Norms:** UNCLOS-based maritime rules are increasingly challenged by unilateral actions.
    - **E.g**. China's Nine-Dash Line claim rejected by PCA (2016) but continues to be enforced through artificial islands and coast guard coercion in the South China Sea
- **Erosion of Humanitarian Law:** Civilian protection norms under the Geneva Conventions are increasingly violated during conflicts.
    - **E.g**. Civilian casualties in Gaza; chemical weapon use in Syria; attacks on hospitals in Yemen; starvation tactics in Tigray
- **Declining Respect for Human Rights:** International human-rights obligations are frequently ignored by both democratic and authoritarian states.
    - **E.g.** Uyghur detentions in Xinjiang; Rohingya crisis in Myanmar; torture during the Global War on Terror; suppression of Mahsa Amini protests in Iran
- **Collapse of Arms-Control Architecture:** Long-standing strategic stability mechanisms are weakening.
    - **E.g.** INF Treaty collapse; erosion of Open Skies Treaty; uncertainty surrounding New START;
- **Weakening Climate & Environmental Commitments:** Environmental obligations increasingly take a back seat to economic and geopolitical interests.
    - **E.g.** Paris Agreement targets off-track; illegal Amazon deforestation; unregulated deep-sea mining.

- **Rise of Selective Multilateralism:** States increasingly support international law only when it aligns with their interests. (**E.g.** Differing responses to Ukraine, Gaza and South China Sea disputes)
- **Normalisation of Coercive State Behaviour:** Economic sanctions, blockades and unilateral actions are increasingly used as instruments of foreign policy.
    - E.g. Strait of Hormuz disruptions; trade restrictions and secondary sanctions)

Reasons for the Erosion

- **Return of Great-Power Rivalry:** Intensifying U.S.–China competition and renewed geopolitical contestation have weakened consensus on global rules.
- **Declining Deterrence of International Institutions:** International institutions often lack effective enforcement powers. (UNSC paralysis due to veto politics)
- **Selective Compliance by Major Powers:** Powerful states often violate norms without facing significant consequences, encouraging imitation by others. (Iraq, Ukraine and South China Sea precedents)
- **Weak Accountability Mechanisms: I**nternational judicial bodies have limited jurisdiction and enforcement capabilities. (ICC jurisdiction constraints and allegations of selective justice)
- **Rise of Nationalism and Strategic Realism:** National security and geopolitical interests increasingly outweigh international obligations.
- **Technological & Hybrid Warfare Challenge**s: Existing international norms struggle to regulate cyber warfare, AI-driven disinformation, autonomous weapons and space-based assets.
- **Fragmentation of Global Governance:** Emergence of competing geopolitical blocs has reduced support for universal multilateral frameworks.

Implications of the Erosion

- **Increased Risk of Conflict:** Weak norms reduce restraints on military aggression and coercive behaviour.
- **Threat to Smaller States**: Smaller and developing countries become more vulnerable when international law loses credibility.
- **Declining Global Trust**: Reduced confidence in international institutions undermines diplomatic conflict resolution.
- **Humanitarian Crises:** Greater civilian suffering due to weakening compliance with humanitarian norms.

- **Economic & Trade Disruptions:** Maritime disputes and sanctions threaten global supply chains and energy security. (South China Sea and Hormuz chokepoints)
- **Arms Race & Strategic Instability:** Weakening arms-control regimes increase risks of nuclear and conventional arms competition.
- **Challenges to Global Commons**: Oceans, climate systems, cyberspace and outer space become increasingly difficult to govern collectively.

Way Forward

- **Reform Global Governance Institutions:** Strengthen legitimacy and representativeness of multilateral institutions. (UNSC reform to reflect contemporary geopolitical realities)
- **Strengthen Accountability Mechanisms:** Enhance enforcement powers of international legal and monitoring institutions. (Greater support for ICC, ICJ and treaty-monitoring bodies)
- **Revitalise Multilateralism**: Promote issue-based coalitions and broader international cooperation on shared challenges.
- **Strengthen Maritime Governance:** Ensure compliance with UNCLOS and peaceful resolution of maritime disputes through international adjudication.
- **Revive Arms-Control Frameworks**: Renew global efforts on nuclear, missile and emerging technology governance.
- **Promote Middle-Power Coalitions:** Countries such as India, Japan, Australia, France and ASEAN members can act as stabilising forces in defence of a rules-based order.
- **Build a Culture of Norm Compliance:** States need to view international law not as a constraint, but as a shared framework for predictable global order. (As Thucydides warned, a system governed solely by power ultimately harms both the weak and the strong)