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INDEX

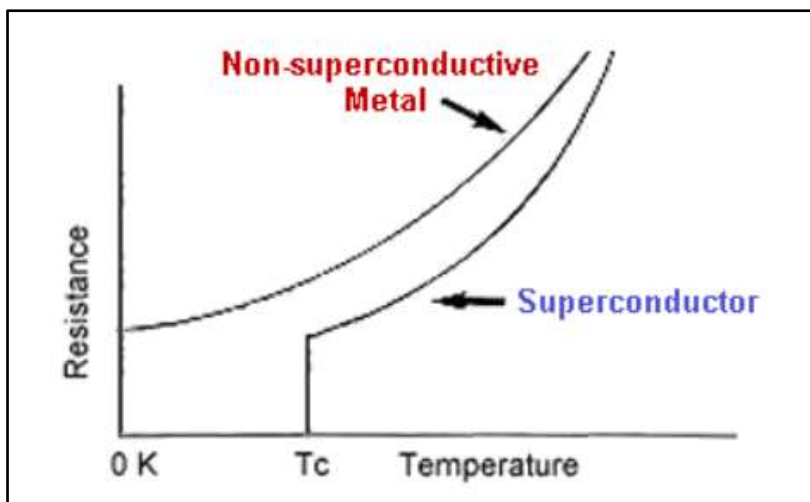
Topic no	Topic Covered	Page No
SCIENCE AND TECHNOLOGY		
1.	HOW TO CHECK IF A MATERIAL IS A SUPERCONDUCTOR	5-6
2.	INDIA DEFENCE MINISTRY TO REPLACE MICROSOFT OS WITH MAYA	7-8
3.	LEARNING FROM THE CHIPS ACT OF THE U.S.	8-10
4.	INDIA TAKES FIRST STEP TO REMOVE ANIMALS FROM DRUG TESTING	10-13
5.	DEVELOP INDIGENOUS WEB BROWSER, GRAB CASH PRIZES	13-15
6.	CAN SMRS HELP INDIA ACHIEVE NET ZERO?	15-17
7.	INDIA'S TB PROBLEM	18-19
8.	NO SAFE HARBOUR FOR GOOGLE ON MISUSE OF TRADEMARK: DELHI HC	20-21
9.	INDIA, TB AND ITS GOAL	22-26
10.	CENTRIFUGAL FORCE – MEET THE RESISTANCE	26
11.	WHY IS INDIA'S DEFENCE MINISTRY DITCHING MICROSOFT WINDOWS FOR UBUNTU-BASED MAYA OS?	26-28
12.	ISRO'S SPACE PROBE TO STUDY THE SUN: WHAT IS THE ADITYA-L1 MISSION, ITS SIGNIFICANCE	28-29
13.	EG.5.1 COVID VARIANT TAKES OFF, INDIA NOT AT RISK CURRENTLY	26-31
14.	DOCTORS CANNOT BE FORCED TO PRESCRIBE POOR QUALITY DRUGS	31-32
15.	IS AIR POLLUTION DRIVING ANTIBIOTIC RESISTANCE?	32-34
16.	AN IMMORTAL CELL LINE AND REPARATION, 70 YEARS LATER	35-36
ECONOMY		
17.	IND-AS ACCOUNTING FRAMEWORK PARTIAL ROLLOUT FROM APRIL 2024	36
18.	POVERTY ALLEVIATION: PUBLIC GOODS VS PRIVATE GOODS	36-38
19.	TRADE POLICY: PROTECTIONISM ON THE RISE	38-39
20.	SEBI ASKS FPIS TO TRADE 10% OF CORPORATE BONDS VIA RFQ	40

21.	CCD CAPITAL GAIN- INVESTORS FROM MAURITIUS, SINGAPORE, CYPRUS FACE TAX CLAIM	40-42
22.	FISCAL FIREPOWER NECESSARY TO HANDLE EXOGENOUS SHOCKS	42-46
23.	CORPORATION TAX RATE CUT RESULTS IN LOSS OF REVENUE FOR FY21	46-47
24.	FINCEN	47-48
25.	GST AS SHARE OF GDP ON A PAR WITH PERSONAL INCOME TAX	48-49
ENVIRONMENT		
26.	BELEM DECLARATION: AMAZON COUNTRIES FAIL TO AGREE ON PROTECTION GOALS	49-51
27.	ECOSYSTEM-BASED ADAPTATION TAKES NATURE-BASED, PEOPLE-CENTRIC APPROACH TO AGRICULTURE	51-52
28.	NUMBER OF ELEPHANTS IN KARNATAKA GOES UP BY 364 FROM LAST CENSUS, TOUCHING 6,395	53
29.	WILDFIRE DESTROYS HAWAIIAN TOWN, LEAVING AT LEAST 36 DEAD	54-55
30.	IN A WARMER, WETTER WORLD, PESTS ARE MULTIPLYING FASTER AND DAMAGING CROPS SEVERELY	55-57
31.	LESS THAN 1% MITIGATION & ADAPTATION FUNDING WENT TO WORLD'S INDIGENOUS GROUPS DESPITE MORE COMMITMENT: REPORT	57-58
32.	AMAZON RAINFOREST THE SCRAMBLE TO SAVE THE PLANET'S LUNGS	58-60
33.	FLYING FOX BATS FOR VIGILANCE WHILE DAY-ROOSTING, FINDS STUDY	60-61
34.	ON A BUMPY ROAD TO NET ZERO, TRUCKS SHIFT GEAR TO REDUCE EMISSIONS	61-62
GEOGRAPHY		
35.	THE PUSH TO BRING THE PRIVATE SECTOR INTO MINERAL EXPLORATION	63-66
36.	STRATEGIES FOR MITIGATING EXTREME FLOODING: CHINA AND SLOVENIA CASES	65-68
37.	GREEN MINERALS RACE: GHANA APPROVES POLICY TO REAP MAXIMUM BENEFITS FROM MINING PROJECTS	68-69
38.	RUZA, A TRADITIONAL WATER HARVESTING SYSTEM FOR THE WATER-SCARCE MOUNTAINS	69-70

39.	NGT ASKS ODISHA GOVERNMENT TO STOP 'ILLEGAL' CONSTRUCTION IN AND AROUND TAMPARA LAKE	70-71
40.	NORTH INDIA MORE AFFECTED BY EL NINO	71
41.	HOW TO MAKE UREA MORE EFFICIENT AS A FERTILIZER	72-73
POLITY		
42.	REFERENDUM NOT AN OPTION UNDER CONSTITUTION: SC	73
43.	CBI ACADEMY JOINING THE INTERPOL GLOBAL ACADEMY NETWORK	73-74
44.	ROW OVER SELECT COMMITTEE FOR DELHI SERVICES BILL	75-77
45.	WHY WAS J&K CONSTITUTION NEVER BROUGHT 'WITHIN THE FOLD' OF THE INDIAN CONSTITUTION, SC ASKS	77-78
46.	CHANGE STATE'S NAME TO KERALAM, ASSEMBLY RESOLUTION URGES CENTRE	78-80
47.	INDIAN POST OFFICE ACT 1898, TO BE REPEALED	80-81
HISTORY		
48.	PRESIDENT MURMU PAYS TRIBUTE TO MATANGINI HAZRA, KANAKLATA BARUA:	81-83
49.	'THERE IS NO LINK BETWEEN LORD MAYO'S ASSASSINATION AND THE CRIMINAL TRIBES ACT'	83-85
SCHEMES		
50.	INTERNATIONAL DAY OF THE WORLD'S INDIGENOUS PEOPLE	85
51.	14 STATES YET TO JOIN CENTRE'S FLAGSHIP EDUCATION SCHEME	86-89
INTERNATIONAL RELATIONS		
52.	US BOOSTS MILITARY PRESENCE IN RED SEA AMIDST IRAN TENSIONS	89-90

Topic 1. HOW TO CHECK IF A MATERIAL IS A SUPERCONDUCTOR

Important for the subject: Science and technology



Introduction

In recent news, South Korean researchers claim to have discovered **LK-99**, a potential **room-temperature superconductor**, which could revolutionize various industries.

However, independent verification is required before confirming its legitimacy.

Identifying a Room-Temperature Superconductor

- To establish LK-99 as a superconductor, researchers need to observe **four key effects** associated with the superconducting state:

Electronic Effect

- Zero Resistance:** A true superconductor exhibits zero electrical resistance. Testing this requires advanced equipment, especially for small sample sizes.

Magnetic Effect

Meissner Effect (Type I Superconductors):

- Below a critical magnetic field strength, type I superconductors expel magnetic fields from their bodies.
- This is observed as a magnet placed near the material is repelled.

Flux Pinning (Type II Superconductors):

- Type II superconductors allow magnetic fields to penetrate partially but prevent their movement within the material.
- Flux pinning enables the material to **return to its original position** when moved within a magnetic field.

Thermodynamic Effect

Change in Specific Heat:

- Superconductors undergo a drastic change in electronic-specific heat at their **transition temperature**.
- The electronic-specific heat decreases as the material enters the superconducting state and increases when warmed back to its nonsuperconducting state.
- The **specific heat** is the heat required to increase the temperature of the electrons in the material by 1 degree Celsius.

Spectroscopic Effect

Energy Level Gap:

- In a superconductor, certain energy levels become inaccessible for electrons.
- Scientists can map these forbidden energy levels as a distinctive ‘gap’ in the material’s energy spectrum.

Bardeen-Cooper-Schrieffer theory of superconductivity:

- **Discovery and Scientists:** In 1957, John Bardeen, Leon Cooper, and John Robert Schrieffer formulated the BCS theory, earning them the **1972 Nobel Prize in Physics**.
- **Explanation of Superconductivity:** The BCS theory explains how electrons in certain materials can overcome their natural repulsion by forming pairs (**Cooper pairs**) at low temperatures through lattice vibrations (**phonons**).
- **Cooper Pairs:** These pairs consist of electrons with opposite spins and zero net momentum, enabling them to move through the lattice without resistance.
- **Energy Gap:** Cooper pairs create an energy gap in the electronic energy spectrum, preventing individual electrons from occupying specific energy levels.
- **Zero Resistance:** Due to Cooper pairs moving unimpeded, superconductors exhibit zero electrical resistance, enabling efficient current flow.
- **Meissner Effect:** The BCS theory accounts for the Meissner effect, where superconductors expel magnetic fields from their interiors when cooled below a critical temperature, leading to **magnetic levitation**.
- **Significance:** The theory revolutionized the understanding of zero resistance and magnetic field expulsion in superconductors, with widespread implications for technology.

Limitations and Unconventional Superconductors:

- Although successful for conventional superconductors, the BCS theory **falls short in explaining unconventional superconductors**, spurring ongoing research in the field.

Topic 2. INDIA DEFENCE MINISTRY TO REPLACE MICROSOFT OS WITH MAYA

Important for the subject: Science and technology

Rising **cyber and malware attacks** on defense and critical infrastructure. The decision to replace **Microsoft OS** with indigenous “**Maya**” OS to counter threats.

Operating System:

- An operating system (OS) is software that manages computer hardware and provides a user interface for software interaction.
- **Examples:** Windows, macOS, Linux, Android, iOS.
- **Ubuntu** is a popular open-source operating system based on the **Linux** kernel. It’s known for its **user-friendly interface and community-driven** development.

Cyber Threats:

- **Malware:** Harmful software that damages computer systems, e.g., viruses and ransomware.
- **Phishing:** Deceptive messages aiming to extract sensitive info or trigger malicious links.
- **DoS (Denial of Service) Attacks:** Flooding systems to disrupt availability through overwhelming traffic.
- **Ransomware:** Encrypts data and demands payment for release.
- **Social Engineering:** Manipulating people to share sensitive details.
- **Hacking:** Unauthorized access for data theft, modification, or disruption.
- **Insider Threats:** Data breaches by individuals within an organization.
- **Malvertising:** Distributing malware through online ads.
- **Data Breaches:** Unauthorized access to private information.
- **IoT Vulnerabilities:** Exploiting weak points in Internet of Things devices.

Maya Operating System: Seamless Transition

- Built on open-source **Ubuntu**, resembling **Windows interface**. Users are assured of minimal disruption during migration.

Chakravyuh: End-Point Detection and Protection

- Chakravyuh deployed alongside Maya OS.
- Designed to **detect and prevent malware attacks**.
- **Evaluation and Adoption by Armed Forces Indian Navy** approves and adopts Maya OS.
- **Indian Army and Air Force evaluating** for future adoption.

Rapid Development of Maya OS

- Maya OS developed by government agencies in **six months**.

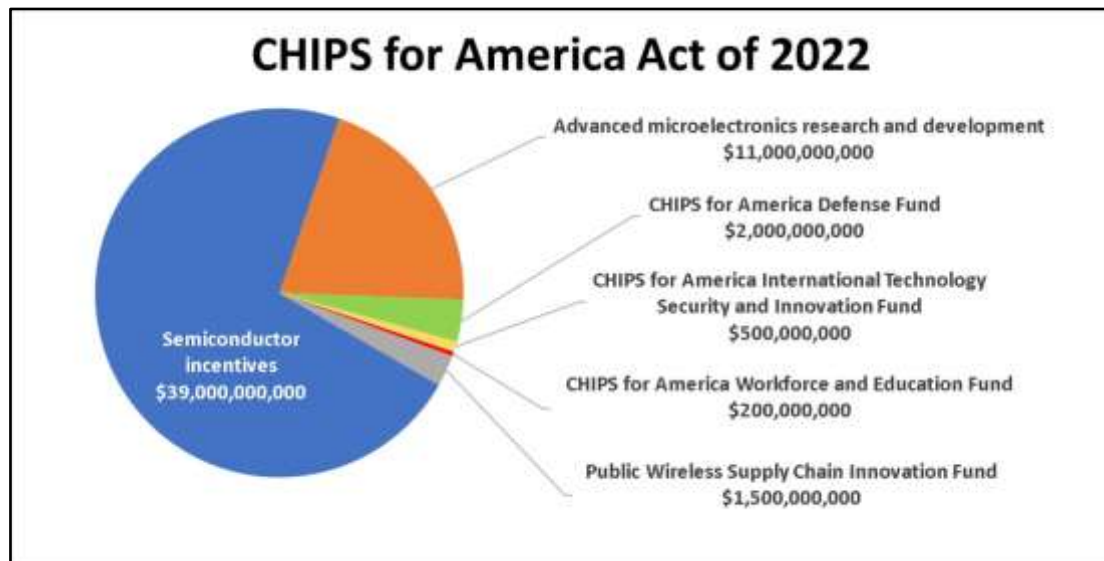
- Addresses escalating cyberattacks and malware incidents.

Implications and Future Outlook

- Maya OS adoption sets **cybersecurity** precedent.
- Encourages sectors to **prioritize local, secure technologies**.

Topic 3. LEARNING FROM THE CHIPS ACT OF THE U.S.

Important for the subject: Science and technology



What is the CHIPS Act and its significance?

The **CHIPS Act (Creating Helpful Incentives to Produce Semiconductors and Science Act)** was enacted in **2022** in the U.S., allocating **\$52.7 billion over five years** to boost American semiconductor competitiveness, innovation, and national security.

How does the CHIPS Act structure its implementation?

Funding Allocation: The Act splits funds into four areas:

- **CHIPS for America Fund (CFAF) (\$50B)** for manufacturing and research, **Department of Defense (DoD) (\$2B)** for unique defense technologies, **Department of State (\$0.5B)** for supply chain security, and **National Science Foundation (NSF) (\$0.2B)** for workforce growth.
- **Inter-Agency Collaboration:** The Act emphasizes inter-agency coordination, reflecting the priority given to the semiconductor sector.

How does India's semiconductor policy compare to the CHIPS Act?

- **Indian Approach:** India's policy is managed by the **Ministry of Electronics and Information Technology (MeitY)**, divided among the **India Semiconductor Mission (ISM)** and the **Center for Development of Advanced Computing (C-DAC)**, lacking the

holistic structure of the CHIPS Act.

- **Suggested Synergy:** India can enhance policy effectiveness by adopting the **multidepartmental approach of the CHIPS Act.**

How does the CHIPS Act emphasize workforce development?

- **Workforce Plans:** Companies seeking funding under the Act must submit workforce development plans, highlighting the importance of skilled personnel.
- **National Semiconductor Technology Center (NSTC):** The NSTC collaborates with **industry and academia** to build a skilled semiconductor engineering workforce.

What is India's approach to building a semiconductor workforce?

Chips2 Startup (C2S) Programme:

- **MeitY's Chips2 Startup (C2S)** program collaborates with universities and colleges.
- **Goal:** Establish India as a semiconductor hub.
- **Applicants:** Open to academia, R&D, startups, and MSMEs.
- **Focus:** Train 85,000 engineers in VLSI and Embedded System Design.
- **Development Targets:** Create 175 ASICs and 20 SoC prototypes in 5 years.
- **ESDM Growth:** Contribute to Electronics System Design & Manufacturing sector.
- **Collaboration:** Involves academia, R&D, industry, startups, and MSMEs.
- **Value Chain:** Covers research, hardware design, system development, and R&D.
- **Participants:** Includes IITs, NITs, IIITs, private colleges, and around 100 academic/R&D institutions.
- **Startup Involvement:** Through collaborative projects, challenges, and proposals.
- **Tracks:** Divided into Systems/SoCs/ASICs development, Application Oriented Working Prototypes, and **Proof of Concept Research.**
- **Nodal Agency:** C-DAC (Centre for Development of Advanced Computing).
- **C-DAC: Centre for Development of Advanced Computing,** an entity under MeitY
- **Established:** Founded in 1988.
- **Purpose:** Engaged in research, development, and innovation in **advanced computing and electronics.**
- **Notable Projects:** Developed India's first supercomputer **PARAM**, and contributed to language technologies.
- **Inclusivity:** To ensure an inclusive strategy, India should focus on **certifying** quality private training institutes alongside universities.

How is accountability structured in the CHIPS Act?

- **CHIPS Program Office (CPO):** The CPO guides project viability criteria, ensuring alignment with strategic goals.
- **Investment Principals and Financial Structuring Directors:** These roles catalyze private sector investment, diversifying funding sources.

- **Transparency and Reporting:** Regular monthly progress reports enhance transparency and accountability.

What areas of research does the CHIPS Act prioritize?

- **Future Research Focus:** The Act allocates **\$11B** to future research, particularly **advanced packaging** for a competitive edge.
- **Forward-Looking Approach:** The Act's focus on advanced packaging emphasizes the importance of **continuous technological innovation**.

How does India's semiconductor strategy compare in terms of research focus?

- **Advanced Manufacturing and Packaging:** India could **balance** core manufacturing with investment in research on advanced techniques, aligning with the CHIPS Act's approach.
- **Strategic Balance:** India should prioritize **immediate manufacturing** capacity while investing in **research for long-term** technological leadership.

What are the lessons that India can learn from the CHIPS Act?

- **Comprehensive Approach:** India should adopt a holistic, multi-agency strategy akin to the CHIPS Act for consistent policy implementation.
- **Research Prioritization:** India should allocate resources for research in emerging semiconductor trends, as per the Act's emphasis.
- **Transparency and Management:** Regular reporting, transparency, and accountability are crucial for successful policy execution.

Topic 4. INDIA TAKES FIRST STEP TO REMOVE ANIMALS FROM DRUG TESTING

Important for the subject: Science and technology

Purpose of the New Drugs and Clinical Trial Rules (2023) Amendment:

The amendment, passed by the **Government of India**, aims to **eradicate animal usage in drug research, prioritizing non-animal and human-relevant approaches**.

Researchers are now empowered to employ technologies like **3D organoids, organs-on-chip, and advanced computational methods** for drug safety and efficacy evaluation.

Traditional Drug Testing and Limitations:

- Conventional drug testing involves assessing candidate molecules in **at least two animal species, including rodents and non-rodents**.
- These methods **often fail to capture human-specific responses** due to **intricate variations** in genetics, age, sex, and pre-existing conditions.
- The drug development process exhibits **high failure rates during human clinical trials**,

underscoring the discrepancy between animal testing and human outcomes.

Exploration of Alternative Testing Methods:

- Researchers are increasingly shifting focus towards **technologies that more accurately emulate human biology** and predict human responses.
- These advancements encompass **organoids (miniaturized human organs), organs-on-chip (microfluidic devices mimicking human physiological conditions), and 3D bioprinting** of human tissues.
- **Personalization of drug testing** using patient-specific cells is a promising facet of these methods.

Global Regulatory Evolution Towards Non-Animal Testing:

- The **European Union** introduced **an action plan** to transition away from animalbased methods in research, regulatory testing, and education.
- The **U.S. FDA Modernization Act 2.0** facilitates the use of non-animal systems for testing new drug safety and effectiveness.
- **South Korea's 'Vitalization of Development, Dissemination, and Use of Alternatives to Animal Testing Methods' bill.**
- **Canada's** amendment to the **Environmental Protection Act** underscores global momentum.

India's Embrace of Non-Animal Testing Methods:

- India amended the **New Drugs and Clinical Trials Rules 2019** in March 2023 to incorporate non-animal methods.
- Public comments and consultation with the **Drug Technical Advisory Board** informed this decision.

Challenges Faced by India in Implementing Advanced Testing Methods:

- The development of organ-on-a-chip systems necessitates **diverse expertise** across fields like cell biology, materials science, fluid dynamics, electronics, engineering, pharmacology, and toxicology.
- Indian academia and industry **require specialized training and human resources** to bridge these interdisciplinary gaps.
- Proposals to establish **institutes akin to the Wyss Institute in Boston** could bolster India's capability in emulating human biology.

Indigenous Resource Limitations Impacting Adoption:

- **Import reliance** for essential reagents, cell-culture materials, and instruments from the U.S., Europe, and Japan presents challenges.
- India has an **opportunity to develop a self-sustaining ecosystem** in areas related to cell

culture, material science, and electronics.

Addressing Variability and Standards in Advanced Testing Methods:

- Variability in data outcomes stems from **discrepancies in lab protocols and expertise**.
- Guideline development for **minimal quality criteria and standards** is crucial to ensure consistency.
- Reevaluation of existing animal testing requirements is imperative in light of **evolving cell-based and gene-editing therapeutics**.

Explaining Key Concepts: Organoids, Organs-on-Chip, and 3D Bioprinting: Organoids:

- Miniature 3D structures replicating specific organs from human cells. Brain organoids for studying neural development and disorders like autism.

Organs-on-Chip:

- Microfluidic devices with human cells mimicking organ functions. Lung-on-chip for studying lung diseases and toxin effects.

3D Bioprinting:

- 3D printing using bio-inks of cells and fluids. Printing functional liver tissue for drug testing and regenerative medicine.

Advantages:

- Better drug testing accuracy compared to animal models. Personalized medicine potential based on individual characteristics.

Challenges:

- Refinement for accurate organ replication. Standardization and validation for reliable results.

Examples:

- **Heart-on-Chip:** Simulates heart tissue behavior for disease and drug studies.
- **Kidney Organoids:** Model kidney development, diseases, and drug toxicity.
- **Skin Bioprinting:** Constructs for cosmetic testing and potential grafts.

Drugs Technical Advisory Board (DTAB):

- DTAB serves as the supreme **statutory decision-making authority** concerning technical aspects of drugs within the nation.
- It is established in accordance with the **Drugs and Cosmetics Act of 1940**. DTAB operates under the umbrella of the **Central Drugs Standard Control**
- **Organization (CDSCO)**, which operates within the **Ministry of Health and Family**

Welfare.

Central Drugs Standard Control Organization (CDSCO):

- CDSCO is India's **top regulatory authority for pharmaceuticals and medical devices**. Established under the **Drugs and Cosmetics Act, 1940**.
- Operates under the **Directorate General of Health Services (DGHS)** in the
- Ministry of Health and Family Welfare.

Mandate and Functions:

- Ensures safety, efficacy, and quality of drugs, cosmetics, and medical devices.
- Reviews new drug approvals, clinical trials, and import/export licenses.
- Regulates manufacturing, sale, distribution, labeling, and packaging.
- Monitors adverse reactions, conducts post-market surveillance.
- Collaborates with state authorities, industry, global regulators.

Topic 5. DEVELOP INDIGENOUS WEB BROWSER, GRAB CASH PRIZES

Important for the subject: Science and technology

The Ministry of Electronics and Information Technology is providing cash incentives totaling ₹3.4 crore for developers who create an **indigenous Indian web browser** that holds global potential.

Challenges in Web Browsing Landscape:

- India's **lack of a trusted root certifying authority** poses challenges for web browsers.
- The Indian government and private websites **need to acquire SSL certificates from foreign certifying authorities** due to this trust gap.

Trust Requirement in the Controller of Certifying Authorities (CCA): Browser ideas participating in the competition must establish trust in the

- **Controller of Certifying Authorities (CCA)**, which is the Indian government's entity responsible for overseeing **digital signatures, including SSL (Security Sockets Layer) certificates**.
- The **IT Act (Section 17)** provides for the **Controller of Certifying Authorities (CCA)** to license and regulate the working of Certifying Authorities.

Understanding Root Certifying Authority:

- An entity entrusted with the **highest level of authority to issue digital certificates**, which are used to authenticate the identities of entities, such as websites, and encrypt communication.
- Root CAs are **implicitly trusted by web browsers and operating systems**. Example: **"DigiCert"** is a well-known Root CA that issues certificates to intermediate CAs,

allowing them to issue SSL certificates for various websites.

Understanding SSL Certificates and Website Security:

- **SSL Certificates:** SSL (Secure Sockets Layer) certificates are digital documents that provide security for online communications. They serve two primary purposes:
- **Encryption:** SSL certificates encrypt data exchanged between a user's browser and a web server, ensuring that sensitive information remains confidential.
- **Authentication:** SSL certificates verify the identity of websites, assuring users that they are interacting with legitimate and trusted sites.
- **Example:** When a user visits a **banking** website, an SSL certificate ensures that the communication between the user's browser and the bank's server is encrypted, protecting account information.

India's Lack of Trusted Root Certifying Authority:

- India **currently lacks a root certifying authority that enjoys trust from major web browsers.**
- Consequently, Indian government and private websites are compelled to procure SSL certificates from foreign certifying authorities.

Role and Status of Root Certifying Authority of India (RCAI):

- The CCA has established the **RCAI** under **section 18(b) of the IT Act** to digitally sign the public keys of CAs in the country.

The requirements fulfilled by the RCAI include the following:

- **The license** issued to the CA is **digitally signed by the CCA.**
- **All public keys** corresponding to the signing private keys of a CA are digitally signed by the CCA.
- However, **SSL certificates issued by RCAI lack recognition from most web browsers**, necessitating reliance on foreign authorities.

Security Incident involving an Indian Certifying Authority:

- The **National Informatics Centre (NIC)**, an organization authorized by the CCA, encountered a security breach in 2014 when **fraudulent certificates** were issued.
- As a result, major operating systems and browsers lost trust in India's CCA, affecting website security.

Reducing Foreign Dependency and Forex Outflow:

- The effort seeks to **diminish the significant foreign exchange outflow** spent on purchasing SSL certificates from foreign sources.
- **Creating a browser that trusts Indian certifying authorities** can help reduce the

financial burden on the nation.

Collaboration and Support:

- The competition is organized and financially supported through a collaboration between the **IT Ministry's Research and Development division** and the **National Internet Exchange of India**.

Topic 6. CAN SMRS HELP INDIA ACHIEVE NET ZERO?

Important for the subject: Science and technology

What are the challenges of decarbonization in the power sector?

Transitioning from fossil fuels to clean energy faces challenges **due to existing infrastructures and energy demands**.

While solar and wind are essential, their **intermittency and energy storage challenges** need to be addressed.

- Ensuring **grid stability, especially during peak demand**, requires the integration of **reliable** power sources.
- According to the **International Energy Agency (IEA)**, the demand for critical minerals like lithium, nickel, cobalt, and rare earth elements needed for cleanenergy technologies will increase by up to 3.5x by 2030, posing supply chain challenges.

What is the role of nuclear power in decarbonization?

- Nuclear power plants (NPPs) **generate 10% of the world's electricity**.
- Nuclear power **significantly reduces CO₂ emissions and provides a continuous electricity supply**.
- The **24×7 generation capability of nuclear power plants** makes them complementary to intermittent renewables.
- **High-skill job creation and technological advancements** are additional benefits of nuclear power.
- According to the **World Nuclear Association**, nuclear power prevented the release of about 1.5 billion tonnes of CO₂ emissions in 2020.

What are Small Modular Reactors (SMRs) and how do they differ from conventional Nuclear Power Plants (NPPs)?

- SMRs are nuclear reactors with a **maximum capacity of 300 MW**, designed for **modularity and flexibility**.
- Unlike conventional NPPs, which have larger capacities, SMRs offer **enhanced safety, scalability, and ease of deployment**.
- SMRs often have **passive safety features**, simplified designs, and **reduced potential for radioactive material release**.

- Their smaller size allows for **modular construction and potentially shorter construction timelines**. SMRs can be installed at brownfield sites and repurpose existing infrastructure, reducing land acquisition challenges associated with larger NPPs.
- These differences make SMRs particularly suited for supporting grid stability, complementing intermittent renewables, and enhancing energy security.

What are the advantages of SMRs compared to conventional NPPs?

- SMRs boast improved safety through **innovative design features**, leading to a lower likelihood of core damage and contamination.
- The **reduced amount of spent nuclear fuel generated by SMRs** simplifies waste management and reduces long-term storage requirements.
- Higher capacity factors and **extended operational lifespans** enhance their economic viability.
- According to the **U.S. Nuclear Regulatory Commission**, SMRs can potentially operate for up to 60 years, maintaining high capacity factors.

How can India benefit from deploying SMRs?

- SMRs can supplement **India's growing energy demand** while reducing carbon emissions.
- **Repurposing existing thermal power plant sites** for SMRs minimizes land usage and accelerates deployment.
- **Local manufacturing of SMRs** can contribute to job creation, technology transfer, and economic growth.
- SMRs can contribute to India's **energy mix diversification** and help achieve its Intended Nationally Determined Contributions (INDCs) under the Paris Agreement.

What is the importance of efficient regulation for SMRs?

- Robust regulations ensure safety, security, and environmental protection. **Collaboration** among countries' regulators and the **International Atomic Energy Agency (IAEA)** ensures global **safety standards** for SMRs.
- Streamline approval timelines and **reduce uncertainty for investors**. Create a conducive environment for **private sector investment and technology adoption**.
- An efficient regulatory regime **balances safety concerns with encouraging technological innovation and investment**.

How can SMRs contribute to India's energy sector transformation?

- SMRs can **augment India's energy mix**, helping meet coal-based power generation targets and boosting renewable capacity.
- **Private sector investments** in SMRs can catalyze innovation and attract financing for nuclear expansion.
- Collaborative efforts between the public and private sectors can accelerate the transition

to cleaner energy sources.

- India's large population and **growing energy needs** make the development of diverse and reliable energy sources, including SMRs, imperative.

What legal and regulatory changes are required for SMRs in India?

- Amending the **Atomic Energy Act** to accommodate private sector involvement while maintaining governmental control over key aspects is crucial.
- Establishing an **empowered regulatory board** ensures oversight, safety, and adherence to international standards.

Balancing private operations with government supervision safeguards security while promoting growth.

- Proper legal frameworks attract private sector investment and foster technology adoption.

How does the India-US '123 agreement' support SMR development?

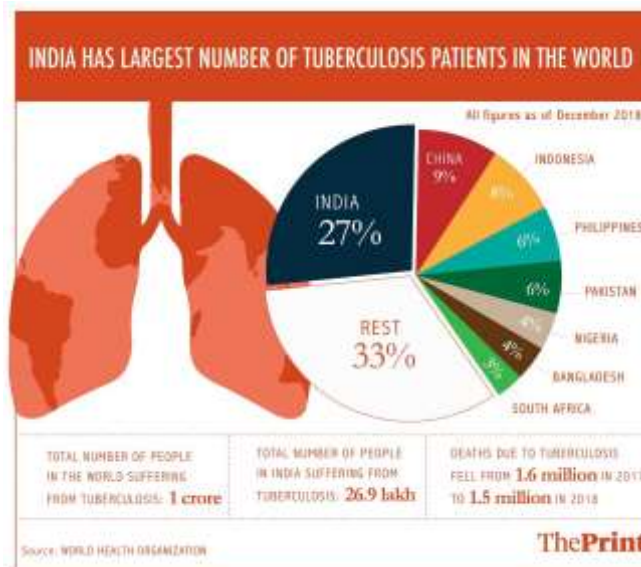
- The agreement's provisions **allow India to strategically manage nuclear fuel and develop reprocessing capabilities under IAEA safeguards.**
- **Collaborative ventures with foreign suppliers** can enhance India's nuclear capabilities and waste management strategies.
- International agreements provide avenues for knowledge sharing, technology transfer, and collaborative research.

How can the public perception of nuclear power in India be improved?

- The **Department of Atomic Energy** should engage in **proactive public outreach**, providing comprehensive information on safety, benefits, and safeguards.
- **Transparency** in communication can dispel misconceptions and build trust in nuclear power.
- **Public awareness campaigns** can educate citizens about the technological advancements and safety measures in modern nuclear power.

Topic 7. INDIA'S TB PROBLEM

Important for the subject : Science and technology



What is Tuberculosis:

Tuberculosis (TB) is an infectious airborne bacterial disease caused by **Mycobacterium tuberculosis**.

TB commonly affects the **lungs (pulmonary TB)** but can also affect **other parts (extrapulmonary TB)**

Tuberculosis **spreads** from person to person **through the air**, when people who are infected with TB infection cough, sneeze or otherwise transmit respiratory fluids through the air.

What is Multidrug-Resistant TB (MDR-TB):

- In MDR-TB, the bacteria that cause TB develop **resistance to antimicrobial drugs** used to cure the disease.
- MDR-TB **does not respond** to at least **isoniazid and rifampicin**, the 2 most powerful anti-TB drugs.
- Treatment options for MDR-TB are **limited and expensive**. **CBNAAT (Cartridges Based Nucleic Acid Amplification Test)** is used for early diagnosis of MDR-TB.

What is Extensively Drug-Resistant TB (XDR-TB):

- XDR-TB is a form of multidrug-resistant TB with **additional resistance to more anti-TB drugs**.
- People who are **resistant to isoniazid and rifampicin**, plus any **fluoroquinolone** and at least one of three **injectable second-line drugs (amikacin, kanamycin, capreomycin)** are said to have XDR-TB

Status of TB :

Recent Step By WHO On TB front:

- The WHO had released a **Standard on Universal Access to Rapid TB Diagnostics**, recommending the **use of molecular diagnostics** as the **initial test** as these are highly accurate, detect resistance to drugs, are cost-effective, and reduce treatment-related delay.
- In December 2022, WHO recommended the **use of the BPaLM/BPaL regimen** for **DR-TB patients**, which offers a much **higher success rate of 89 percent** and **reduces the pill burden to only three to four pills** a day and shortens the treatment duration.

What are measures taken by India to eradicate TB

- **The National Tuberculosis Elimination Programme (NTEP)** – Aims to strategically **reduce TB burden** in India by It was previously known as **Revised National Tuberculosis Control Programme (RNTCP)**.
- **The National Strategic Plan for TB Elimination** – It was launched to achieve the target of **ending TB by 2025 in a mission mode**. It is a multi-pronged approach which aims to **detect all TB patients** with an emphasis on reaching TB patients seeking care from private providers and undiagnosed TB in high-risk populations
- **Ni-kshay Poshan Yojana (Nutritional Support to TB)** – It helps to **meet the nutritional requirements of TB patients**, especially the underserved **Patient Provider Support Agencies (PPSA)** – To engage the private sector,
- Patient Provider Support Agencies (PPSA) have been rolled out across 250 districts through the domestic setup and **JEET initiative**
- **Universal Drug Susceptibility Testing (UDST)** – To ensure every diagnosed TB patient is tested to **rule out drug resistance** before or at the time of treatment initiation itself.
- **Pradhan Mantri TB Mukh Bharat Abhiyaan** – To bring together all community stakeholders to support those on TB treatment and accelerate the country's progress towards TB elimination.
- **Ayushman Bharat – Health and Wellness Centres** – To decentralize comprehensive primary healthcare including TB care services at the grassroots level.
- **Bedaquiline and Delamanid** -Newer drugs like Bedaquiline and Delamanid have also been made **available for management of DR-TB**.

What are the global measures to eradicate TB:

- The WHO (World Health Organisation) has launched a joint initiative “ **Treat. All. EndTB**” with the **Global Fund and Stop TB Partnership**.
- **End TB Strategy by World Health Organization (WHO)**: It serves as a blueprint for countries to **reduce TB incidence by 80%, TB deaths by 90%, and to eliminate catastrophic costs for TB-affected households by 2030**.
- **Sustainable Development Goal 3** – To end the TB epidemic by 2030. **Moscow Declaration, 2017 to End TB**.

Topic 8. NO SAFE HARBOUR FOR GOOGLE ON MISUSE OF TRADEMARK: DELHI HC

Important for the subject : Science and technology

The Delhi High Court Thursday ruled that **Google's use of trademarks as keywords** under its **Ads Programme** may lead to infringement, making it ineligible for safe harbour status.

- This means Google will be **legally bound** if advertisers use another company's trademark to improve their search ranking and that affects the trademark owner or confuses consumers. Besides, the ruling could affect Google's advertising revenue.
- Being an intermediary, the tech giant enjoys **legal immunity** under **Section 79** of the **IT Act** from actions of third-party companies on its platforms.
- However, the court said Google is the provider of the keywords and an active participant in the use of trademarks. It also selects the recipients of the information that were infringing links, and hence the safe harbor status will not be applicable.
- Case: **Google LLC vs DRS Logistics case**.

What is the Google Ads programme?

- Google runs an **advertisement service (Ads Programme)**, under which sponsored links of advertisers are displayed along with the results of search queries. Under this, Google suggests keywords to its advertisers which can help them be featured higher on the search results page.
- **Google** lets its advertisers **pay a higher amount** and **display their advertisements by using the logistics company trademark in the keywords**.
- Such activities of Google constitute infringement of its registered trademarks.

Trademark:

- A trademark is a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises.
- Trademarks are protected by **Intellectual Property Rights (IPR)**. In India, trademarks are governed by the **Trade Marks Act 1999**, which was amended in **2010**.
- It **legally** differentiates a product or service from all others of its kind and recognizes the source company's ownership of the brand.
- The Act guarantees protection for a trademark that is registered with the **Controller General of Patents, Designs, and Trademarks**, also known as the **trademark registry**.
- A trademark is **valid for 10 years**, and can be renewed by the owner indefinitely every 10 years. It serves as a badge of origin exclusively identifying a particular business as a source of goods or services.

What Constitutes a Trademark Violation?

- **Using a registered trademark without authorisation of the entity** that owns the trademark is a violation or infringement of the trademark.

- Trademark infringement in India is defined under **Section 29** of the **Trademarks Act, 1999**.
- There are several ways in which a trademark can be infringed such as Deceptive similarity, passing off (Say, a brand logo is misspelt in a way that's not easy for the consumer to discern).
- In such cases, courts have to determine whether this can cause confusion for consumers between the two.
- In such cases, the infringing products need not be identical, but similarity in the nature, character and performance of the goods of the rival traders has to be established.

For example, Cadila Healthcare Limited vs Cadila Pharmaceuticals Limited.

- There are two types of infringement – **direct** and **indirect infringement**.

Direct Infringement

- **Unauthorized person** – this means a person who is not the owner or the licensee of the registered trademark.
- **'Identical' or 'Deceptively similar'** – the test for determining whether marks are identical or not is by determining whether there is a chance for a likelihood of confusion among the public. If the consumers are likely to get confused between the two marks, then there is an infringement.
- **Registered Trademark** – You can only infringe a registered trademark. For an unregistered Trademark, the common law concept of passing off will apply.
- **Goods/ Services** – In order to establish infringement even the goods/ services of the infringer must be identical with or similar to the goods that the registered Trademark represents.

Indirect infringement

- **Indirect infringement** is a common law principle that holds accountable not only the direct infringers but also the people who induce the direct infringers to commit the infringement. Indirect infringement is also known as **secondary liability** has **two categories: contributory infringement** and **vicarious liability**.

A person will be liable for contributory infringement in two circumstances:

- When a person knows of the infringement. When a person materially contributes or induces the direct infringer to commit the infringement.

A person will be vicariously liable under the following circumstances:

- When the person has the ability to control the actions of the direct infringer. When a person derives a financial benefit from the infringement.
- When a person has knowledge of the infringement and contributes to it.

Topic 9. INDIA, TB AND ITS GOAL

Important for the subject: Science and technology

What is Tuberculosis:

Tuberculosis (TB) is an infectious airborne bacterial disease caused by **Mycobacterium tuberculosis**.

TB commonly affects the **lungs (pulmonary TB)** but can also affect **other parts (extrapulmonary TB)**

Tuberculosis **spreads** from person to person **through the air**, when people who are infected with TB infection cough, sneeze or otherwise transmit respiratory fluids through the air.

What is Multidrug-Resistant TB (MDR-TB):

- In MDR-TB, the bacteria that cause TB develop **resistance to antimicrobial drugs** used to cure the disease.
- MDR-TB **does not respond** to at least **isoniazid and rifampicin**, the 2 most powerful anti-TB drugs.
- Treatment options for MDR-TB are **limited and expensive**. **CBNAAT (Cartridges Based Nucleic Acid Amplification Test)** is used for early diagnosis of MDR-TB.

What is Extensively Drug-Resistant TB (XDR-TB):

- XDR-TB is a form of multidrug-resistant TB with **additional resistance to more anti-TB drugs**.
- People who are **resistant to isoniazid and rifampicin, plus any fluoroquinolone and at least one of three injectable second-line drugs (amikacin, kanamycin, capreomycin)** are said to have XDR-TB

Status of TB Cases in India:

- **India** continues to have the **largest share of the global TB burden**.
- The **total number of incident TB patients** (new and relapse) notified during **2021** in India were **33 lakh** as **opposed to that of 16.28 lakh in 2020**. In **2022**, **22 lakh cases of TB were registered** in the country.
- According to the **National TB prevalence survey** in India **2019-2021** report, nearly **64% did not get tested for TB**. It varied from **46% in the case of Kerala to 88% in Haryana**.
- **50% of all people** with bacteriologically confirmed tuberculosis have **no symptoms** and by the time symptoms develop, **transmission has probably already occurred**.
- There is **emerging evidence that TB may not fall under a binary of latent infection (asymptomatic and non-infectious) and active disease (symptomatic and infectious)**.
- Instead, **TB may be a spectrum of disease**, including incipient and subclinical stages.

- In 2020, the RNTCP was renamed as the National TB Elimination Program (NTEP) to underscore India's goal to eliminate TB in the country by 2025, five years ahead of the Sustainable Development Goals.
- The National Strategic Plan for Tuberculosis Elimination (2017-2025) was developed to achieve the goal.
- Though the National Strategic Plan for Tuberculosis Elimination (2017-2025) outlined a paradigm shift in approach and strategy to achieve the ambitious goal, by 2020, it became clear that the NSP will not be able to meet these objectives.
- A new National Strategic Plan for Tuberculosis Elimination (2020-2025) to end TB was launched.

What is National Strategic Plan for TB Elimination:

- It is a framework to guide the activities of all stakeholders whose work is relevant to TB elimination in India.
 - It provides goals and strategies for the country's response to the disease during the period 2017 to 2025.
 - It aims to direct the attention of all stakeholders on the most important interventions or activities that the RNTCP believes will bring about significant changes in the incidence, prevalence and mortality of TB.
 - It will guide the development of the national project implementation plan (PIP) and state PIPs, as well as district health action plans (DHAP) under the national health mission (NHM).
- What is Sputum smear microscopy:**
- Sputum smear is a rapid test to detect the presence of acid-fast bacilli (AFB) but a single sputum test lacks sensitivity.
 - Even when people finally get tested for TB, sputum smear microscopy with about 50% sensitivity has been used for diagnosis in a majority of the cases in India, thus leading to a huge number of missed TB cases.

Drawbacks:

- Besides lower sensitivity, smear microscopy is ill-equipped to diagnose rifampicin resistance.
- Way back in 2014, the WHO guidelines clearly stated that GeneXpert may be used rather than conventional microscopy and culture as the initial diagnostic test in all adults suspected of having TB.

What is Molecular tests for TB:

- Molecular tests are not only more sensitive than smear microscopy, they also help identify rifampicin resistance at the outset.
- The rapid molecular diagnostic machines have been scaled up from 40 in 2014 to 5,090 in 2022.

Can improved nutrition help prevent TB:

- According to recent reports in Lancet and The Lancet Global Health nutritional support has helped prevent both tuberculosis (TB) among household contacts and mortality among TB patients in a trial in Jharkhand.
- In 2017, the World Health Organization had estimated that undernutrition is responsible for twice the number of TB cases than HIV globally

What was the outcome of the trial:

- The RATIONS (Reducing Activation of Tuberculosis by Improvement of Nutritional Status) trial enrolled 2,800 people with pulmonary TB disease and 10,345 household contacts of TB patients.
- While all the TB patients received nutritional support, household contacts were randomly assigned to receive either nutritional support or usual diet alone. There were **5,621 household contacts in the intervention arm and 4,724 contacts in the control group.**
- While there were **108 (4%) deaths among TB patients** across all body weights, **mortality among those under 35 kg body weight (severely underweight) was 7%**
- In comparison, in a study carried out by the Chennai Based NIRT in Tiruvallur district, Tamil Nadu, which did not provide any nutrition support to the TB patients, mortality was **14% in those weighing under 35 kg; mortality dropped to 4% among those weighing over 35 kg.**
- Incidence of TB deaths reduced by **12% with a oneunit increase in BMI and by 23% for a twounit increase in BMI.**
- **With nutritional support, at six months, the proportion of those with normal BMI increased from 16.5% to 43.5%.**
- In general, **extreme undernutrition — BMI less than 13 in men and BMI less than 11 in women — can often be fatal.**
- However, in the current trial, more than 85% of such TB patients survived with nutritional support. Over 80% of TB patients had a BMI less than 18.5 and nearly 49% had a BMI less than 16 (severely underweight).
- There was 5% weight gain in the first two months which was associated with 60% lower risk of TB mortality.
- As per a 2022 study undertaken in India, the **absence of weight gain during treatment in patients with severe undernutrition was associated with a five fold higher death rate.** Among the household contacts, **nutritional support led to a 39%-48% reduction in TB disease in the intervention group compared with the control arm.**
- In the study that lasted for six months, **122 people in the control group developed TB whereas the intervention arm had only 96 TB cases.** There was a **39% reduction in TB incidence — pulmonary and extrapulmonary — while there was 48% reduction in pulmonary TB.**
- The **39%-48% reduction in TB disease in the household contact intervention arm was after adjusting for confounding factors** such as TB preventive treatment to

children below five

What effect does undernutrition have:

- According to **WHO Global TB report 2022** many new cases of TB are attributable to **five risk factors** — **undernourishment, HIV infection, alcohol use disorders, smoking (especially among men) and diabetes.**
- In **TB endemic countries** such as India, **undernutrition is the most widely prevalent risk factor**, accounting for the “highest population attributable risk for TB in India”
- As per a **2016 paper** by **NIRT researchers**, undernutrition is an important risk factor for **progression of latent TB infection to TB disease. It increases the risk of drug toxicity, TB relapse and mortality. For each unit reduction in BMI, the risk of TB increases by about 14%.**
- Undernourished patients also **tend to have poor bioavailability of drugs such as rifampicin, leading to treatment failure** and development of multidrug resistance.

How do schemes like Nikshay Poshan Yojan and Nikshay Mitra help:

- **Nikshay Poshan Yojana is a direct benefit transfer (DBT) scheme for nutritional support to TB patients. It was launched in 2018.**
- All notified TB cases are provided with a financial **incentive of ₹500 per month.**
- According to the 2022 India TB report, seven million TB patients have benefited between 2018 and 2022, and **₹2,089 crore has been disbursed** during this period.
- Also, as of March 9, 2023, **55 lakh consented TB patients across India adopted by Nikshay Mitras will receive nutritional support**

What are some other government measures:

- **The National Tuberculosis Elimination Programme (NTEP)** – Aims to strategically **reduce TB burden** in India by It was previously known as **Revised National Tuberculosis Control Programme (RNTCP).**
- **The National Strategic Plan for TB Elimination** – It was launched to achieve the target of **ending TB by 2025 in a mission mode.**
- It is a multi-pronged approach which aims to **detect all TB patients** with an emphasis on reaching TB patients seeking care from private providers and undiagnosed TB in high-risk populations.
- **Ni-kshay Poshan Yojana (Nutritional Support to TB)** – It helps to **meet the nutritional requirements of TB patients**, especially the underserved **Patient Provider Support Agencies (PPSA)** – To engage the private sector, Patient Provider Support Agencies (PPSA) have been rolled out across 250 districts through the domestic setup and **JEET initiative**
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stakeholders to support those on TB treatment and accelerate the country's progress towards TB elimination.

- **Ayushman Bharat – Health and Wellness Centres** – To decentralize comprehensive primary healthcare including TB care services at the grassroots level.
- **Bedaquiline and Delamanid** -Newer drugs like Bedaquiline and Delamanid have also been made **available for management of DR-TB**.

Topic 10. CENTRIFUGAL FORCE – MEET THE RESISTANCE

Important for the subject : Science and technology

Centrifugal force:

Centrifugal force is a force that an object perceives when it is moving in a curved path – always in the direction away from the center of the path of rotation.

The **centrifugal force** is often called an **actual force** but it is really the **product of inertia** – the tendency for an object to maintain its state of motion.

Unlike actual forces, which arise from an interaction between forces like gravity or magnetism, the **centrifugal force arises when an object resists a change of direction**. And moving on a curved path is to constantly change direction.

Use of this force:

- The concept of **centrifugal force** can be applied in **rotating devices**, such as **centrifuges**, **centrifugal pumps**, **centrifugal governors**, and **centrifugal clutches**, and in **centrifugal railways**, **planetary orbits** and **banked curves**, when they are analyzed in a rotating coordinate system.
- Research laboratories, the pharmaceutical and dairy industries, and the nuclear energy sector around the world use this force in a machine called **centrifuge**. **Mixtures of substances** are placed in small containers that are **spun very fast**.

Topic 11. WHY IS INDIA'S DEFENCE MINISTRY DITCHING MICROSOFT WINDOWS FOR UBUNTU-BASED MAYA OS?

Important for the subject : Science and technology

India's Defence Ministry has decided to replace **Microsoft Operating System (OS)** in all its computers that can connect to the Internet with **Maya**, an **Ubuntubased OS built locally**.

The new OS is currently being rolled out only in the Defence Ministry computers, and not the three Services.

What is kernel architecture?

- Devices powered by **Microsoft's OS** run on the **Windows NT kernel**. A **kernel** is the core of an operating system. It runs on a computer's **Random Access Memory (RAM)** and gives the device instructions on how to perform specific tasks.

- Prior to building the **kernel architecture**, programmers used to run codes directly on the processor.
- In the **1970s**, **Danish computer scientist Per Brinch Hansen** pioneered the approach of splitting what needs to be done by a processor from how it executes that task, thus introducing the **kernel architecture** in the **RC 4000 multi programming system**.

It separated policy from mechanism in the OS design.

- This design was **monolithic**, meaning a single programme contained all necessary codes to perform kernel-related tasks.
- This architecture provided rich and powerful abstraction for the underlying hardware. But it was also large and difficult to maintain as the lines of codes ran in the millions.
- Limitations in the **traditional architecture** led to a **new kernel design** called the **microkernel**.
- This design broke down the **monolithic system** into **multiple small servers** that communicate through a **smaller kernel** while giving more space for user customisations.
- This change allowed developers to run patches easily without rebooting the entire kernel. It did have some **drawbacks** like larger running memory space and more software interactions that reduced the computer's performance.

About Maya OS:

- Developed by **Indian government agencies** within **six months**. **Agencies involved:** Defence Research and Development Organisation
- (DRDO), the Centre for Development of Advanced Computing (C-DAC), and the National Informatics Centre (NIC).
- **MayaOS** has been named after the **Sanskrit word Maya** which means **“illusion.”**
- It is **aimed at preventing malware attacks by cybercriminals** who are increasingly targeting critical infrastructure and government agencies.
- The **new OS** will be backed by a **protection system** called **Chakravyuh**. This end point system is also being deployed in the computers that have Maya installed.
- MayaOS has a similar interface and functionality as Windows, making it easy for users to adapt to it.

Difference between Windows OS and Maya OS:

- **Windows** runs on a **hybrid kernel architecture** which is a **microkernel design coupled with additional codes** that help enhance performance.

Apple's MacOS also uses a **hybrid kernel** called **XNU**.

- And **Ubuntu**, a **Linux OS** that was used to build **Maya**, runs on **monolithic architecture**. Linux versions are called **“distributions”** or **“distro”**, and they comprise free and open-source software.

- **Android** is also based on the **Linux kernel**.

Cyber threats and malware:

- The cybersecurity firm **FireEye**, now rebranded as **Trellix**, discovered a cyber spy campaign that compromised dozens of government agencies and private organisations in the U.S. IT software provider **SolarWinds'** network management software, **Orion** was hacked and replaced by malware.
- Apart from **cybersecurity**, the reason behind this move is to **assist IT modernisation efforts**.

Topic 12. ISRO'S SPACE PROBE TO STUDY THE SUN: WHAT IS THE ADITYA-L1 MISSION, ITS SIGNIFICANCE

Important for the subject :Science and technology

The **Indian Space Research Organisation (Isro)** on August 14 released images of the **Aditya-L1 mission** — the space agency's first attempt to study the Sun.

The satellite has reached the **Satish Dhawan Space Center (SDSC)** in **Sriharikota, Andhra Pradesh**, for its integration with the launch vehicle, PSLV.

What is the Aditya-L1 mission?

- The **Aditya-L1** will observe the **Sun** from a close distance, and try to obtain information about its atmosphere and magnetic field.
- It's equipped with **seven payloads (instruments)** on board to study the **Sun's corona**, **solar emissions**, **solar winds and flares**, and **Coronal Mass Ejections (CMEs)**, and will carry out **round-the-clock imaging of the Sun**.

Why is studying the Sun important?

- The **solar weather and environment** affect the weather of the entire system. Variations in this weather can change the orbits of satellites or shorten their lives, interfere with or damage onboard electronics, and cause power blackouts and other disturbances on Earth. Knowledge of solar events is key to understanding space weather.
- To learn about and track Earth-directed storms, and to predict their impact, continuous solar observations are needed.
- Every storm that emerges from the Sun and heads towards Earth passes through **L1**, and a satellite placed in the **halo orbit** around **L1** of the **Sun-Earth system** has the major advantage of continuously viewing the Sun without any occultation/eclipses.

What is Lagrange Point-1 (L1):

- **L1** refers to **Lagrangian/Lagrange Point 1**, one of five points in the orbital plane of the Earth-Sun system.
- Lagrange Points, **named after Italian-French mathematician Josephy-Louis Lagrange**,

are positions in space where the **gravitational forces of a two-body system** (like the Sun and the Earth) **produce enhanced regions of attraction and repulsion**.

- These can be used by spacecraft to **reduce fuel consumption** needed to remain in position.
- The **L1 point** is home to the **Solar and Heliospheric Observatory Satellite (SOHO)**, an international collaboration project of **NASA** and the **European Space Agency (ESA)**.
- The **L1 point** is about **1.5 million km from Earth**, or about one-hundredth of the way to the Sun.
- **Aditya L1** will perform continuous observations looking directly at the Sun. **NASA's Parker Solar Probe**, launched in **2018**, has already gone far closer — but it will be looking away from the Sun.
- The earlier **Helios 2 solar probe**, a joint venture between **NASA** and the space agency of erstwhile West Germany, went within **43 million km** of the Sun's surface in **1976**.

How much heat will the Aditya-L1 face?

- The **Parker Solar Probe** during its flyby of the Sun has faced blisteringly hot temperatures of **more than one thousand degree Celsius** and remained fully operational.
- The **Aditya-L1**, however, will not face such heat as it is slated to stay much further away from the Sun in comparison with NASA's mission.

But there are other challenges.

- Many of the instruments and their components for this mission are being manufactured for the first time in India, presenting as much of a challenge as an opportunity for the country's scientific, engineering, and space communities.

Topic 13. EG.5.1 COVID VARIANT TAKES OFF, INDIA NOT AT RISK CURRENTLY

Important for the subject :Science and technology

EG.5, a descendent of the **Omicron lineage of XBB.1.9.2**, was designated a **variant of interest (VOI)** after risk evaluation by the **World Health Organization** on August 10, 2023. It was previously designated a **variant under monitoring**.

EG.5 may spread globally and contribute to a surge in case incidence. **EG.5** was **first reported** on February 17 of this year. As of August 9, **EG.5** has been reported from a total of **48 countries**.

- In **India**, one **EG.5.1** was detected in Maharashtra. The **global genome sequencing databases** indicate the remarkable rise of the new sublineage. **EG.5.1** is taking off everywhere. It is definitely out-competing its predecessors in the **XBB lineage** that were dominating most of 2023.
- The recent **VOI classification of EG.5** suggests that due to changes in the receptor binding domain of the spike protein, the variant escapes neutralization by antibodies

generated from previous infections or vaccinations.

- **EG.5** carries an **additional F456L amino acid mutation** in the **spike protein** compared to the parent **XBB.1.9.2** subvariant and **XBB.1.5**.
- Within the **EG.5** lineage, the **subvariant EG.5.1** has an **additional spike mutation Q52H** and represents **88 per cent** of the available sequences for **EG.5** and its descendent lineages.

Virus variant:

- Variants of a virus have one or more mutations that differentiate it from the other variants that are in circulation. While most mutations are deleterious for the virus, some make it easier for the virus to survive.

Classification:

- The **US Centers for Disease Control and Prevention (CDC)** classifies variants into **four categories**:

Variant of Interest (VOI):

- A variant with specific genetic markers that have been associated with changes to receptor binding, reduced neutralization by antibodies generated against previous infection or vaccination, reduced efficacy of treatments, potential diagnostic impact, or predicted increase in transmissibility or disease severity.
- **An example of VOI** is the **1.617 variant** of the virus which has **two mutations**, referred to as **E484Q** and **L452R**.
- This variant is classified as a **VOI** by the **World Health Organization (WHO)** as well.
- Both are separately found in many other coronavirus variants, but they have been reported together for the first time in India.

Variant of Concern (VOC):

- A variant for which there is evidence of an increase in transmissibility, more severe disease (e.g., increased hospitalizations or deaths), significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures.
- The **1.1.7 (UK variant)**, **B.1.351 (South Africa Variant)**, **P.1 (Brazil Variant)**, **B.1.427**, and **B.1.429 variants** circulating in the **US** are classified as **VOCs**.

Variant of High Consequence:

- A **variant of high consequence** has clear evidence that prevention measures or medical countermeasures have significantly reduced effectiveness relative to previously circulating variants.
- So far, the **CDC** has not found variants of high consequence in circulation in the **US**.

Variants Under Investigation (VUI):

- **Public Health England (PHE)** says that if the variants of **SARS-CoV-2** are considered to have epidemiological, immunological or pathogenic properties, they are raised for formal investigation.
- At this point, the variants emerging from the **1.617 lineage** are designated as **VUI**.

Topic 14. DOCTORS CANNOT BE FORCED TO PRESCRIBE POOR QUALITY DRUGS

Important for the subject :Science and technology

Following the **National Medical Commission's (NMC)** latest regulation asking doctors to **prescribe generic drugs**, the **Indian Medical Association (IMA)** on

August 14 demanded urgent intervention from the government stating that **they should not be forced to do the work of chemists**, and prescribe **"poor quality drugs"** to patients.

- The biggest impediment to **generic drugs** is the **uncertainty about its quality**.
- The **quality control** in the nation being very weak, there's practically no guarantee of the quality of drugs, and prescribing drugs without assured quality would be detrimental to patient health.
- Less than **0.1%** of the drugs manufactured in India are tested for quality.

National Medical Commission (NMC):

- The **NMC** has been constituted by an **act of Parliament** known as **National Medical Commission Act, 2019** which came into force on **25.9.2020** by gazette notification dated 24.9.2020.
- The **Board of Governors** in supersession of **Medical Council of India** constituted under **section 3A** of the **Indian Medical Council Act, 1956** stands dissolved thereafter.

Mission and Vision:

The **Aim** of the **National Medical Commission** are to:

- improve access to quality and affordable medical education, (ensure availability of adequate and high quality medical professionals in all parts of the country;
- promote equitable and universal healthcare that encourages community health perspective and makes services of medical professionals accessible to all the citizens;
- encourages medical professionals to adopt latest medical research in their work and to contribute to research;
- objectively assess medical institutions periodically in a transparent manner; (vi) maintain a medical register for India;
- enforce high ethical standards in all aspects of medical services; have an effective grievance redressal mechanism.

Indian Medical Association (IMA):

- **IMA** is the **largest represented organization of doctors** of the modern system of medicine in India which looks after the interests of doctors as well as the wellbeing of the community at large.
- It has a membership of **3.5 lakh doctors** spread over in **28 State Branches, 5 Union territorial Branches** and **1702 local branches** in almost all the districts of India.
- In the **pre-independence era** there were **Associations of doctors** at few places in India. But in one of the doctors' conferences, it was discussed that all these Associations of all these doctors should continue functioning under one Association.
- In **1928**, the name **Indian Medical Association** was coined.
- **Indian Medical Association**, in the year **1946** helped in organization of the **World body of medical Associations across the globe**, namely, **World Medical Association (WMA)** and thus became its **Founder member**.
- As a Member organization of **WMA**, it has been and continues to play an important role in its deliberations.
- **IMA** hosted the **III World Conference on Medical Education** under the joint auspices of **WMA** and **IMA** in **New Delhi** in **1966** and in **2009** hosted **WMA General Assembly** and **Dr. Ketan Desai** was installed as **WMA President** in **2015**.
- **IMA** has got the opportunity to lead **CMMAO** on three occasions. **IMA** will lead **CMMAO** as its **President** in **2019**.
- **Vision:** IMA is a democratic forum working to maintain dignity, honour and social security of the medical fraternity in the country. It strives to provide quality healthcare to each and every citizen of India. IMA is committed to preserve the autonomy of the profession.

Objectives:

- To promote and advance medical and allied sciences in all their different branches and to promote the improvement of public health and medical education in India
- To maintain the honour and dignity and to uphold the interest of the medical profession and to promote co-operation amongst the members thereof;
- To work for the abolition of compartmentalism in medical education, medical services and registration in the country and this to achieve equality among all members of the profession.

Topic 15. IS AIR POLLUTION DRIVING ANTIBIOTIC RESISTANCE?

Important for the subject :Science and technology

Introduction

PM2.5 pollution's microscopic impact on global health.

The potential link between PM2.5 and antibiotic resistance explored. A study published in

Lancet Planetary Journal suggests a correlation.

Antibiotic Resistance (AMR) Threat Magnitude of AMR

- AMR is responsible for more deaths than **malaria or HIV/AIDS**.
- **Directly** caused **1.27 million deaths**; associated with 4.95 million deaths globally in 2019.
- **AMR factors**: misuse of antibiotics, weak sanitation, disease burden, and healthcare infrastructure.

Air Pollution and Antibiotic Resistance

- Global connection established between air pollution and antibiotic resistance.
- **Every 10% air pollution rise correlates with 1.1% antibiotic resistance increase.**
- **Novel approach**: combat clinical antibiotic resistance by tackling environmental pollution.

Impact and Challenges of Antibiotic Resistance

Microbe Evolution and Drug Resistance

- **Example**: **ciprofloxacin** resistance in **Escherichia coli (E. coli)**.
- **Multidrug-resistant TB strains** reduce the effectiveness of **isoniazid** and **rifampin**.
- Bacterial changes lead to drug inefficacy and increased disease burden.

Healthcare Ramifications

- Antibiotic resistance **complicates treatment** for diseases like tuberculosis, cholera, and pneumonia.
- **Surgical and chemotherapy patients** at **heightened infection risk**. Extends hospitalization, widens healthcare inequities.

India's Antibiotic Usage and AMR Circulation High Antibiotic Usage

- India's indiscriminate antibiotic use, poor hygiene, lack of awareness. **COVID-19** pandemic worsens trend with increased antibiotic sales.

Circulation of AMR

- Antibiotic-resistant bacteria and genes spread via humans, animals, water, air. India's water sources contain antimicrobial-resistant bacteria due to inadequate treatment.

Study Findings: Air Pollution and Antibiotic Resistance PM2.5 and Resistance

- Each 1% PM2.5 rise is linked to a 0.5-1.9% antibiotic resistance increase. Airborne transmission affects **densely populated regions (urbanization) 2018**: 18.2 million years of life lost, \$395 billion cost due to premature deaths.

Projected Consequences

- Air pollution-linked antibiotic resistance caused **480,000 premature deaths in 2018**.
- By 2050, a possible 17% increase in antibiotic resistance will lead to nearly 840,000 annual premature deaths.
- Meeting **WHO PM2.5 reduction targets** could reduce antibiotic resistance by 16.8%, and lower premature deaths by 23.4%.

WHO PM2.5 targets

Airborne Dissemination of Antibiotic Resistance Air as Pathway

- Airborne **PM2.5 carries bacteria and antibiotic-resistant genes over distances**.
- PM2.5 particles **penetrate bodies**, linked to chronic conditions.
- PM2.5's contribution to antibiotic resistance surpasses antibiotic use and water contamination.

Uncertainties

- The **mechanism** of air pollutants affecting antibiotic resistance **is still unclear**.
- Study observational, not proving causation.
- **More medical evidence is needed** for verification.

The concept of Antibiotic Resistance (AMR) Explained

AMR Basics

- **AMR**: Microbes evolve, and become resistant to drugs.
- **Example**: Due to resistance, antibiotic ciprofloxacin is ineffective against *Escherichia coli* (*E. coli*).
- AMR makes infections **difficult to treat** and increases disease burden. AMR is observed across bacteria like *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and more.

Contributing Factors

- **Overuse and misuse of antibiotics** in humans and animals.
- Poor infection prevention, inadequate sanitation, and lack of access to clean water.
- Global travel facilitates the spread of resistant microbes.

Solutions and Global Efforts

- **Responsible antibiotic use** and prescription by healthcare professionals.
- **Better sanitation and hygiene practices** to prevent infections. Investment in **new antibiotic development** and alternatives to traditional antibiotics.

Topic 16. AN IMMORTAL CELL LINE AND REPARATION, 70 YEARS LATER

Important for the subject: Science and Technology

The U.S. biotech company **Thermo Fisher Scientific** came to an agreement with the family of **Henrietta Lacks** after 70 years, whose cancer cells were removed from her without her permission when under treatment in a hospital in Maryland.

HeLa Cells:

- The cells taken from **Henrietta Lacks** went on to become an **immortalised cell line** called **HeLa** (for Henrietta Lacks) used in scientific research.
- **HeLa cells** were the **first human cells** to be successfully cloned in **1953** by Theodore Puck and Philip I. Marcus at the University of Colorado, Denver, and since then, **HeLa cells** have “continually been used for research”.
- The cells have been instrumental in at least three Nobel-prizewinning discoveries.
- It is said that in the **1960s**, **HeLa cells** that were taken on space missions to study the effects of space travel on living cells and tissue, divided even more quickly in **zero gravity**.

Why a compensation now?

- It is reportedly the most commonly used cell line across the world, and yet neither the patient, a 31- year old poor, African American woman, nor her family were acknowledged or compensated for the contribution.
- The cells were taken from the patient, without her consent, when she was under treatment for cervical cancer.

Cell culture:

- Cell culture is the process by which cells are grown in a petridish, in a lab in controlled conditions, outside of their natural environment.
- These cells are used in critical and path breaking scientific research to develop drugs, vaccines (polio), study the effects of radiation, how pathogens affect humans, gene mapping etc.
- Usually cells cultured in the lab from human cells could be kept alive for only a few days, Important for the subject to the phenomenon of **cellular senescence**, or the **cessation of cell division**.
- However, **Henrietta Lacks’ cells** allowed scientists to create an **immortalized cell line**.
- An **immortalized cell line** is a population of cells from which would normally not proliferate indefinitely but, due to mutations, has achieved the ability to keep on dividing, never reaching the point of **senescence**. It was observed that the **cells doubled every 20–24 hours** unlike previous specimens that died out.

Topic 17. IND-AS ACCOUNTING FRAMEWORK PARTIAL ROLLOUT FROM APRIL 2024

Important for the subject: Economy

15 insurance companies, across life and non-life, to adopt the new IND-AS accounting framework from April 1, 2024.

- Insurance Regulatory and Development Authority of India (IRDAI) has announced partial roll-out of new accounting standards for the insurance industry.
- The government is expected to roll out **IND-AS 117** following recommendations received from the **National Financial Reporting Authority (NFRA)** based on the proposals by the **ICAI (Institute of Chartered Accountants of India)**. The new accounting standard will replace **IND AS 104**, Insurance Contracts.
- The move is aimed at **bringing Indian accounting practices closer to global standards**. It will enable stakeholders to understand insurers' **risk exposure, profitability, and financial position** accurately.
- The move is set to take the insurance industry towards a **risk-based capital regime** from the **current factor-based solvency regime** and will also bring the industry closer to the new IND-AS.
- Designed in coordination with IFRS-17, the revised standard under **IND-AS 117** will mandate insurers to explicitly declare **unbiased estimates** of future cash flows, **discount rates** reflecting the **contracts' cash flows**, and adjustments for **nonfinancial risk**. Further, revenue will no longer be equal to written premiums but to the change in contract liability.

Why limited rollout?

- The identified 15 companies that have **foreign equity partners** and/or strategic collaborations for the purpose. The reason here is that these entities may have estimates of the financials as per parallel **IFRS-17** for their consolidated balance sheets.
- Decision taken to allow more time to smaller insurers for adopting the accounting standard. This is because their solvency is more likely to be impacted, leading to higher capital requirements, industry sources said, adding that implementation for PSU insurers is also expected to take some time.
- The transition is expected to hurt insurance companies with a higher share of relatively riskier products such as ULIPs (unit-linked insurance plans).

Topic 18. POVERTY ALLEVIATION: PUBLIC GOODS VS PRIVATE GOODS

Important for the subject: Economy

NITI Aayog put out a report two weeks ago on multidimensional poverty. The index measures deprivation across three equally weighted dimensions – Health, Education, and

Standard of living.

These three dimensions are represented by 12 indicators such as nutrition, child and adolescent mortality, maternal health, years of schooling, school attendance, cooking fuel, sanitation, drinking water, electricity, housing, assets, and bank accounts.

So should the government provide all these goods to alleviate poverty?

- Economics defines public goods as those whose marginal cost of production is zero, meaning that one person's consumption does not reduce that of the other. Police, justice, clean air are examples of this.
- Health, drinking water, roads and education on the other hand are quasi-public goods. But cooking fuels and other such things aren't.
- They are purely private. The problem arises from the political practice of making the provision of these things the responsibility of the government. In other words, private goods have been turned into public or quasi-public goods disregarding the definitions of such goods in economics.

What happens when private goods are provided by government:

- It has a direct impact on the levels of taxation, investment and borrowing by governments.
- Basically, turning private into public goods increases the consumption expenditure of governments at the expense of investment expenditures, much of which is intended precisely to increase the supply of higher order or original public goods like defence, police, justice, etc.
- That is why the answer lies in increasing incomes so that private goods can remain private and expanding the tax base so that the output of real public goods can be expanded.

Public and Quasi Public Goods

Public Goods:

- Public goods are goods or services that are **non-excludable** and **non-rivalrous** in consumption.
- Non-excludable means that once the good is provided, it is available for all to use, and no one can be effectively excluded from using it.
- Non-rivalrous means that one person's use or consumption of the good does not diminish its availability or usefulness to others.
- Classic examples of public goods include street lighting, national defense, and clean air. Due to their characteristics, public goods often require government intervention or provision, as private markets may fail to supply them efficiently.

Quasi-Public Goods (Club Goods):

- Quasi-public goods, also known as club goods, exhibit characteristics of both public and

private goods. They are non-rivalrous but excludable.

- Non-rivalrous means that multiple individuals can consume the good simultaneously without reducing its availability to others.
- Excludable means that it is possible to limit or exclude individuals from using the good if they do not pay for it.
- Quasi-public goods often have **high fixed costs and low marginal costs**, making them suitable for exclusive access through membership or subscription fees.
- Examples include cable television, toll roads, and private parks. Unlike pure public goods, quasi-public goods can be provided by both the public and private sectors.

Topic 19. TRADE POLICY: PROTECTIONISM ON THE RISE

Important for the subject: Economy

Government mandates licensing for laptop, tablet imports. Government is set to impose a licensing requirement for imports of laptops, tablets and personal computers with immediate effect, a move that could hit hard the likes of Apple, Dell and Samsung and force them to boost local manufacturing.

Current regulations in India allow companies to import laptops freely, but the new rule mandates a special licence for these products similar to restrictions India imposed in 2020 for inbound TV shipments.

What is the motive behind this move:

- While the justification hints about national security concerns, the more plausible reason could be that the Centre's revised production linked incentive (PLI) scheme for IT hardware was failing to find traction.
- Additionally the policy is to address the **substitution of certain goods** that are imported heavily.

What is the WTO norm on licensing and tariffs:

- WTO allows licensing Important for the subject to fair and equitable application and administration, and to prevent procedures that have **restrictive or distortive effects** on imports.
- Countries can implement custom tariffs as long as they are within WTO-mandated **"bound rates"**.

India's tariff scenario:

- Prior to the large-scale hikes, India's peak customs duty — the highest of the normal tariff rates — on non-agriculture products had been coming down steeply from 150% in 1991-92 to 10% in 2007-08.
- This has seen a progressive reversal since 2016. India's Trade Policy Review at the World Trade Organisation (WTO) in 2021 made a clear note of this trend.

- In some cases where customs duty hikes are close to or have effectively crossed the WTO-mandated “bound rates”.

Impact of high customs/tariffs:

- The direct result of high tariffs is trade diversion. This means switching from a less costly source to a more-costly source. The hike in import duties also render India’s exports uncompetitive too, given that a significant portion of exports are **import-intensive**.
- Trade barriers end up **promoting the inefficiencies** of domestic manufacturing, at the **cost of hurting consumers**.

India’s Import Substitution Policy

- The substitution industrial policy of India was an economic strategy adopted by India after the independence period. This policy aimed to **promote domestic industrialization and reduce reliance on imports** by encouraging the **production of goods domestically that were previously imported** from other countries.
- The government imposed high tariffs and restrictions on certain imports to protect domestic industries and promote local production. This was the policy of import substitution.

Key features of the substitution industrial policy of India include:

- Import Substitution
- Licensing and Regulation
- Focus on key priority sectors
- Import Control and Exchange Rate Management
- The substitution industrial policy had some success in promoting industrialization and building a base for economic growth in India.
- However, it also faced challenges, including **inefficiencies in protected industries**, bureaucratic hurdles, and limited exposure to international competition.
- In the 1990s, India shifted its economic policies towards liberalization and globalization, moving away from the import substitution approach to embrace market-oriented reforms and increased integration into the global economy.

Bound Rates

- These are the customs duty rates that a country commits to all other members under the **Most Favoured Nation (MFN)** principle, and breaching these rates could effectively put a country at risk of being branded as “protectionist” as per WTO norms that prohibit discrimination by the use of tariffs by its 164 members.
- WTO requires member countries to notify bound tariffs on products as per the commitments resulting from negotiations. Country-wise bound tariff commitments are listed in the documents called the Schedule of Commitments and are an integral part of the WTO Agreement.

Topic 20. SEBI ASKS FPIS TO TRADE 10% OF CORPORATE BONDS VIA RFQ

Important for the subject: Economy

SEBI mandates foreign portfolio investors (FPIs) to place at least 10% of their trades in corporate bonds through the Request For Quote (RFQ) platform of stock exchanges.

The move is aimed at increasing the liquidity on the RFQ platform and enhancing the transparency and disclosures pertaining to investments in corporate bonds, which in turn will encourage investment by FPIs in the corporate bond segment.

What is the RFQ platform?

- RFQ, which was launched on BSE and NSE in February 2020, is an electronic platform that **enables multi-lateral negotiations** to take place on a **centralised online trading platform** with straight-through processing of **clearing and settlement to complete the trade**. A wide variety of **debt securities** are available for trading on the RFQ platform.
- While the overall corporate bond investment by FPIs is low, the percentage of such trades carried out on the RFQ platform is even lower.
- Now FPIs will have to undertake at least **10 percent** of their total **secondary market trades in corporate bonds** by value by placing/seeking quotes on the RFQ platform of stock exchanges.
- The move is aimed at **increasing the liquidity on the RFQ platform** of stock exchanges and to enhance the transparency and disclosure pertaining to trading in the secondary market in corporate bonds.
- SEBI said that it already provided a similar mandate for other intermediaries such as alternative investment funds (AIFs), portfolio management services (PMS) and stock brokers.

Topic 21. CCD CAPITAL GAIN- INVESTORS FROM MAURITIUS, SINGAPORE, CYPRUS FACE TAX CLAIM

Important for the subject :Economy

In News: Foreign investors from Mauritius, Cyprus and Singapore have been on the receiving notices for gains from investment in fully or **compulsorily convertible debentures (CCDs)** issued by Indian companies.

CCDs, which are compulsorily converted into equity after a specified period, became popular after the tax treaties of these regions with India were amended in 2017, with the aim of taxing capital gains on shares in India.

Government view:

- The tax authorities believe that capital gains accruing or arising to a tax resident is now taxable in India irrespective of the nature of instruments that are being sold.
- FDI guidelines treat CCDs as equity for the purposes of reporting to the Reserve Bank of

India. However, they are treated as debt for the purpose of income tax till the time of conversion.

Foreign investor view:

- Foreign investors believe that the sale of securities other than shares continue to remain non-taxable.
- As CCD are debt instruments, there is no capital gains tax to be paid in India by, say, a Mauritius investor subscribing to CCDs of an Indian company.
- Investors in CCDs are legitimately using these instruments for earning interest income and do not have the rights enjoyed by an equity holder until converted

What does the treaty say?

- The treaties, post amendment, made **capital gains on “shares” taxable in India**. However, the amendments do not apply to debt instruments.
- Debt instruments still fall under the **residual clause in the tax treaties**, according to which the gains on such instruments will be taxable only where the resident is based.

What do the **Authority for Advance Ruling (AAR)** and High court say?

- The **Authority for Advance Ruling** had ruled that the **gains arising on sales** of equity shares and CCDs were **taxable as interest income**.
- The HC, however, held that these gains should be treated as capital gains. What may be the solution?
- Tax department can decide to treat **CCDs as shares** because the RBI treats these instruments at par with equity. Alternatively authorities may apply GAAR to these transactions.

Compulsorily Convertible Debentures (CCDs)

- Compulsorily Convertible Debentures (CCDs) are a type of financial instrument issued by companies to raise capital from investors. They are a hybrid security that **combines the features of debentures and equity shares**.
- The term “Compulsorily Convertible” implies that these debentures must be converted into equity shares of the company after a specified period or when certain conditions are met.
- The conversion price is the predetermined price at which each CCD will be converted into equity shares. The conversion ratio determines how many equity shares will be issued for each CCD. These terms are set at the time of issuing the CCDs.

General Anti-Avoidance Rules

- GAAR stands for General Anti-Avoidance Rules, and it refers to a set of rules and regulations aimed at preventing **tax avoidance practices** by businesses and individuals.
- In India, GAAR was introduced to counter aggressive tax planning that goes against the

- intent of the tax laws. It became effective in India from 1 April 2017, almost eight years after it was first introduced in the then proposed Direct Taxes Code Bill (DTC), 2009.
- The main objective of GAAR is to target transactions and arrangements that are not driven by legitimate business purposes but are primarily designed to gain tax benefits. GAAR applies to any arrangement that's considered an **'impermissible avoidance arrangement.'**
 - If GAAR is invoked, the tax authorities have the power to ignore the arrangement for tax purposes, and **levy taxes as if the arrangement hadn't been made.** The tax benefits that the taxpayer attempted to gain through the arrangement can be denied.
 - The law also includes a **'Principal Purpose Test' (PPT)**, which ensures that GAAR is invoked only if one of the main purposes of an arrangement is to obtain tax benefits. If a taxpayer **can prove that the arrangement wasn't entered into primarily for tax benefits**, GAAR may not apply.
 - The introduction of GAAR has led to increased transparency in tax planning and has prompted businesses to ensure their transactions have legitimate business purposes beyond just tax benefits.

Authority for Advance Rulings (AAR)

- The Authority for Advance Rulings (AAR) is a **quasi-judicial body** established under the **Income Tax Act, 1961** in India. It serves as a **mechanism for taxpayers to seek clarification and guidance** on the interpretation of tax laws and their **potential tax liabilities** before undertaking certain transactions.
- AAR is composed of retired judges of the Supreme Court of India or retired Chief Justices of High Courts, along with members from the Indian Revenue Service (IRS). The members must have experience in taxation and law.
- AAR's jurisdiction extends to non-resident taxpayers, including foreign companies, and Indian residents who have transactions with non-residents. It covers various aspects of direct taxation, such as income tax, capital gains tax, and tax residency.
- While the AAR's ruling is binding, it can be challenged through an appeal in the High Court if either the taxpayer or the tax department disagrees with the ruling. However, the ruling remains in effect until the appeal is resolved.

Topic 22. FISCAL FIREPOWER NECESSARY TO HANDLE EXOGENOUS SHOCKS

Important for the subject :Economy

In News: Finance ministry expressed inability to release the Medium-Term Expenditure Framework (MTEF)

Delayed Release of MTEF:

- Global uncertainties prompt Finance Ministry to hold back Medium-Term Expenditure Framework (MTEF) release.

- MTEF necessitates growth and revenue assumptions for meaningful expenditure projections.
- Maintaining “fiscal firepower” is crucial for managing external shocks.

Understanding FRBM and MTEF:

- Fiscal Responsibility and Budget Management (FRBM) Act guides fiscal planning.
- MTEF provides a roadmap for expenditure planning over a specified period. Flexible expenditure management and adherence to FRBM law enable effective responses to uncertainties.

FRBM Act, 2003

- The act is officially titled the “**Fiscal Responsibility and Budget Management Act, 2003.**”

Objective:

- The primary objective is to ensure **inter-generational equity** in fiscal management and **long-term macroeconomic stability**.
- This includes reducing **fiscal imbalances** and **preventing excessive government borrowing**.

Fiscal Indicators:

- The act focuses on fiscal indicators such as fiscal deficit, revenue deficit, and effective revenue deficit to assess fiscal health.
- **Fiscal deficit** represents the excess of total expenditure over total receipts (excluding borrowings).
- **Revenue deficit** signifies the excess of revenue expenditure over revenue receipts (excluding borrowings).
- **Effective revenue deficit** denotes revenue deficit minus grants for the creation of capital assets.

Fiscal Responsibility and Budget Management Rules:

- The **central government** has the authority to prescribe rules for better fiscal management.
- These rules provide detailed guidelines for calculating fiscal indicators and ensuring consistency in computation.

Medium-Term Fiscal Policy Statement:

- The central government is required to present a Medium-Term Fiscal Policy Statement **along with the annual budget**.
- The statement outlines the government’s fiscal policy strategy for the **next three years**, ensuring alignment with fiscal consolidation objectives.

Fiscal Policy Strategy Statement:

- Presented **along with the annual budget**, this statement outlines fiscal policies and strategies for the **upcoming year**.
- It establishes how the government intends to adhere to fiscal targets and achieve its fiscal policy objectives.

Macroeconomic Framework Statement:

- The Macroeconomic Framework Statement is an integral part of the fiscal framework under the act.
- It outlines the assumptions and projections for **key macroeconomic indicators such as GDP growth, inflation, and fiscal indicators**.
- This statement provides a macroeconomic context for the fiscal policy strategy presented **in the annual budget**.

Medium-Term Expenditure Framework (MTEF):

- MTEF is a government planning tool that aligns policy priorities with budget allocations over 3-5 years, improving resource utilization and fiscal management.
- **In India**, the MTEF was introduced to enhance transparency, accountability, and efficiency in government expenditure.

MTEF comprises three components:

- **Rolling Multi-Year Perspective:** Outlines government's expenditure priorities over **3 years**, allocating resources to sectors.
- **Linkage with Policy Priorities:** Matches budget to government's key policies, supporting economic and social goals.
- **Performance Measurement:** Uses indicators to evaluate program impact, aiding monitoring and effectiveness assessment.

Fiscal Management Principles:

- The act lays down fiscal management principles including **stability, equity, efficiency, and transparency**.
- These principles guide the government's fiscal decisions and actions.

Targets for Fiscal Indicators:

- The act sets targets for fiscal indicators to guide fiscal consolidation efforts.
- These targets include gradually reducing fiscal deficit and ultimately eliminating revenue deficit to achieve a balanced budget.
- **Budget-2021:** FRBM amended to provide a fiscal deficit of 6.8% (2021-22) and 4.5% (2025-26)-because a 4.5% target is recommended by 15th FC.

Escape Clauses:

- The act includes provisions allowing deviations from fiscal targets in exceptional circumstances.
- These escape clauses provide flexibility during times of natural disasters, national security concerns, and other exigencies.

FRBM Act Section 4(2):

- National Security / Act of War
- National Calamity
- If agriculture output and farm incomes collapse
- Fall in real output/ GDP growth rate beyond x%
- Structural reforms in the economy with unanticipated fiscal implications Govt may over cross/deviate from the fiscal deficit target by up to 0.5% of GDP, as recommended by NK Singh's FRBM Review Committee.

Reporting and Transparency:

- The act emphasizes transparency by requiring **the regular release of fiscal data and information.**
- The government must report fiscal performance, adherence to targets, and **reasons for deviations to the Parliament and the public.**

Review and Amendments:

- The act permits periodic reviews and potential amendments to ensure its relevance in changing economic conditions.

Exemption for Special Category States:

- Special Category States may be exempted from certain provisions based on their unique circumstances.

Consequences of Non-Compliance:

- If the central government deviates from the targets, it must present reasons and corrective measures in the Budget.

The following documents to be released along with the budget annually –

- Macroeconomic Framework Statement
- Medium-Term Fiscal Policy Statement
- Fiscal Policy Strategy Statement
- Medium-Term Expenditure Framework
- Exogenous Shock
- An exogenous shock refers to an unexpected and sudden event that originates from

outside a particular economic system or model. It is a disturbance that affects the system but is not caused by the internal dynamics of that system. Exogenous shocks can have significant impacts on economies, financial markets, industries, and various other sectors.

- **Examples:** Examples of exogenous shocks include natural disasters like earthquakes, tsunamis, and hurricanes, sudden geopolitical events like wars or political crises, unexpected technological breakthroughs that disrupt traditional industries, and sudden shifts in commodity prices due to global supply disruptions.
- **Responses:** Depending on the nature and severity of the shock, various responses can be observed. Policymakers might implement emergency measures to stabilise the economy, financial institutions might adjust investment strategies, and businesses might alter production plans or supply chains.

Topic 23. CORPORATION TAX RATE CUT RESULTS IN LOSS OF REVENUE FOR FY21

Important for the subject :Economy

In News: Govt lost Rs 1 lakh crore revenue in FY21 after corporation tax rate cut.

A massive cut announced in **2019** effectively resulted in a 10-percentage-point drop in the tax rate.

The corporation tax rate for all existing companies (manufacturing and nonmanufacturing) was cut to 22 per cent (without surcharge and cess) from 30 per cent.

- Following the cut in corporation tax rate for companies in September 2019, the government faced a **revenue loss of Rs 1,00,241 crore** in the **financial year 2020- 21**.
- Corporation tax collection data shared by Chaudhary, the provisional revenues stood at over Rs 8.28 lakh crore in the financial year 2022-23, higher than over Rs 7.12 lakh crore in 2021-22.

New Tax regime:

- Under the new regime introduced in September 2019, a tax rate of **15 per cent** was announced under **Section 115BAB** for **newly incorporated domestic companies**, which make fresh investment by March 31, 2023, for manufacturing, production, research or distribution of such articles or things manufactured. This was later extended by one year to March 31, 2024.
- The corporation tax rate for all existing companies (manufacturing and nonmanufacturing) was cut to **22 per cent** (without surcharge and cess) from 30 per cent.

Criticism:

- The Reserve Bank of India had earlier noted that the new tax regime did not help kick-start the intended investment cycle.
- In its Annual Report for 2019-20, it said the tax rate cut may have been “utilised in debt servicing, build-up of cash balances and other current assets rather than restarting the

capex cycle”.

Laffer Curve

- The Laffer Curve is a graphical representation illustrating the relationship between tax rates and government revenue. It suggests that at low tax rates, increasing taxes leads to higher revenue as economic activity remains incentivized.
- However, as tax rates continue to rise, they can eventually discourage productive behavior, resulting in lower economic activity and ultimately decreasing government revenue. The curve implies an optimal tax rate that maximizes revenue, highlighting the balance between generating funds for public services and maintaining a favorable environment for economic growth.
- Governments frequently use this relationship as a basis for granting tax cuts both for corporations and individuals.

Topic 24. FINCEN

Important for the subject : Economy

US set to unveil long-awaited crackdown on real estate money laundering

What is FinCEN:

FinCEN stands for the **Financial Crimes Enforcement Network**.

It is a **bureau of the United States Department of the Treasury** responsible for **combating financial crimes**, including money laundering, terrorist financing, and other illicit financial activities. It was **set up in 1990**.

- FinCEN’s **primary role** is to **collect, analyze, and disseminate financial intelligence** to law enforcement agencies, regulators, and financial institutions to **help combat financial crimes** and protect the integrity of the financial system.
- FinCEN **exercises regulatory functions** primarily under the **Currency and Financial Transactions Reporting Act of 1970**, as **amended by Title III of the USA PATRIOT Act of 2001** and other legislation, which legislative framework is commonly referred to as the **“Bank Secrecy Act” (BSA)**.
- FinCEN **serves as the FIU for the United States** and is one of more than 100 FIUs making up the **Egmont Group, an international entity** focused on information sharing and cooperation among FIUs.

What is Suspicious Activity Report:

- It is a document that **financial institutions** and certain other businesses are required to **file with the Financial Crimes Enforcement Network (FinCEN)** in the **United States** when they **encounter transactions or activities** that appear to be **suspicious or potentially** related to **money laundering, terrorist financing**, or other illegal or illicit activities.

- These documents are **meant to red flag, within 30 days** of the transaction's occurrence of criminal funds or **any form of dirty money; insider trading**; potential money laundering; terror financing; any transaction that raises suspicion.
- These are **used to detect crime but cannot be used as direct evidence to prove legal cases.**

What is FIU:

- FIU stands for “**Financial Intelligence Unit.**“ It is a **specialized government agency** or unit responsible for **collecting, analyzing, and disseminating financial intelligence** related to **suspicious and potentially illicit financial activities.**
- The primary purpose of an FIU is to **combat money laundering, terrorist financing, and other financial crimes.**

What is Financial Intelligence Unit – India (FIU-IND):

- FIU-IND is an **independent body** reporting **directly to the Economic Intelligence Council (EIC) headed by the Finance Minister.**
- FIU-IND is a **multi disciplinary body** with a **sanctioned strength of 75 personnel**—from different organizations namely Central Board of Direct Taxes (**CBDT**), Central Board of Excise and Customs (**CBEC**), Reserve Bank of India (**RBI**), Securities Exchange Board of India (**SEBI**), Department of Legal Affairs and Intelligence agencies.
- It was set by the Government of India on **18th November 2004.**

Topic 25. GST AS SHARE OF GDP ON A PAR WITH PERSONAL INCOME TAX

Important for the subject :Economy

In News: Goods & services tax (GST) as a share of gross domestic products (GDP) at the same level as personal income tax share, a report by Finance Ministry shows.

- GST has become the largest contributor to indirect taxes, ever since its implementation in FY 2017-18.
- Share of GST in GDP went up to 3.1 per cent in FY23 from 2.8 per cent in FY21, During the same period share of personal income tax rose from 2.5 to 3.1 per cent of GDP.
- This rise in GST is attributed to consumption demand, compliance, and some impact of inflation. However, another view is that this trend is not leading to an overall **regressive taxation** regime.
- Apart from GST, indirect taxes also include Custom Duty and Central Excise Duty (levied mainly on petrol and diesel). At the same time, direct taxes comprise corporate income tax (CIT) and personal income tax (PIT).
- According to a budget document, the Direct and Indirect Tax receipts are individually estimated to grow at 10.5 per cent and 10.4 per cent, respectively.
- The overall **tax (GTR) buoyancy** is estimated at 0.99. As the tax collection from GST stabilises, it is likely to give a boost to the Indirect tax collection with an estimated GST buoyancy of 1.14 in the ensuing year.

- In BE 2023-24, it is estimated that the direct and indirect taxes contribute 54.4 per cent and 45.6 per cent, respectively, to Gross Tax Revenue (GTR).
- The sustained increase in GST is the cumulative impact of transparent and digital tax administration, rapid economic growth, and a boost in consumption expenditure, particularly at the lower income level in the economy. Stronger growth and high inflation has also contributed to the GST numbers.
- The increase in GST could also have some negative consequences: For example, it could lead to higher prices for goods and services, which could impact the purchasing power of consumers.
- GST on most of the food products is either zero or taxed at low rates, so the people from the lower income strata are protected. But if the indirect tax collections overtake direct tax collections.

Progressive and Regressive tax

- Progressive tax refers to a tax system in which the **tax rate increases as the taxable income of an individual or entity rises**. This approach aims to distribute the tax burden more **equitably** by imposing higher tax rates on those with higher incomes, reflecting a principle of greater ability to pay.
- In contrast, regressive tax is a system where the **tax rate decreases as income increases**. This can lead to a relatively higher tax burden on lower-income individuals, as a larger portion of their income goes towards taxes, potentially exacerbating income inequality.
- Direct taxes are considered progressive as people's tax incidence rises with a rise in income, while indirect taxes are called regressive as these are levied according to the category of goods (merit vs demerit) or value of goods and not the basis of income of the consumer.
- Since lower-income individuals tend to spend a larger portion of their income on basic necessities like food, clothing, and housing, a higher percentage of their income goes towards paying these taxes.
- Hence countries strive to strike a balance between direct and indirect taxes to ensure that the tax burden is distributed more equitably and takes into consideration the ability to pay.

Topic 26. BELEM DECLARATION: AMAZON COUNTRIES FAIL TO AGREE ON PROTECTION GOALS

Important for the subject: Environment

Leaders from the **eight countries** across the Amazon, including **Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname** and **Venezuela**, failed to agree on the goal to protect the rainforest at the ongoing Amazon Summit organised by the **Amazon Cooperation Treaty Organization (ACTO)**.

- A clear joint goal, such as the **protection of 80 per cent of the forest to avoid the tipping point**, is absent in the declaration and leaders couldn't even agree on zero deforestation.

- Scientists have warned that if the combined deforestation and degradation of the Amazon crosses a **20-25 per cent** threshold, the forest could reach an **irreversible tipping point** that may result in the **dieback of the entire ecosystem**.
- Under the **Global Biodiversity Framework**, member countries had agreed to protect at least 30 per cent of land and sea by 2030.

Belem Declaration:

- The **Belem Declaration** released during the **Amazon Summit** recognises **Indigenous knowledge** as a condition for biodiversity conservation and calls for ensuring full and effective participation of Indigenous Peoples in decision-making and public policy formulation processes.
- **Indigenous People** are under constant threats and land rights will not only give them better protection, it will also prevent deforestation and protect the rich biodiversity within these territories.

Amazon fund:

- The **Amazon Fund's goal** is to encourage Brazil and other tropical developing nations with forests to continue and expand voluntary reductions of greenhouse gas emissions caused by deforestation and forest degradation.
- It serves as a **REDD+** mechanism and oversees the Fund in addition to raising funds for investments in initiatives to stop, monitor, and fight deforestation as well as to advance the protection and sustainable use of forests in the Amazon Biome.

The Amazon Fund's primary focus areas are as follows:

- Indigenous lands
- Conservation units
- Rural Environmental Registry – CAR
- Settlement
- Combating illegal fires and burn-offs
- The **Brazilian Development Bank (BNDES)**, which is in charge of contracting and overseeing the projects as well as publicising activities, results, and impacts, **manages the Amazon Fund**.
- **Government agencies** (such as the Brazilian Forestry Service), **NGOs**, **community groups**, **international organisations**, and **universities** are examples of **implementing institutions**.
- **Project monitoring** is based on **BNDES processes**, with mechanisms designed to ensure that grant recipients spend their money on the activities specified.
- The organization is required to submit an **Effectiveness Assessment Report** two years after the project has been implemented.

Amazon Cooperation Treaty Organization (ACTO):

- Established: **25 February 1995**
- Headquarters: **Brasília, Brazil**
- The **Amazon Cooperation Treaty Organization (ACTO)** is an international organization aimed at the promotion of sustainable development of the Amazon Basin.
- The **Amazon Cooperation Treaty (ACT)** was signed on 3 July 1978 and amended in 1998.
- **Group members** — Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela.

Topic 27. ECOSYSTEM-BASED ADAPTATION TAKES NATURE-BASED, PEOPLE-CENTRIC APPROACH TO AGRICULTURE

Important for the subject: Environment



Multilayer farming:

Multilayer farming is the process of growing multiple crops in a single field. This is done by planting a crop on top of an already existing crop. The first crop is then harvested, and the land is used to plant another crop.

The purpose of this is to save space on land and improve efficiency. It is an ancient method of farming that is used to increase crop yield and avoid competition between plants.

Multilayer farming is also an example of an **ecosystem-based adaptation (or EbA) approach** in agriculture.

Ecosystem-based adaptation (EbA):

- **EbA** is a relatively new term coined in **2008** by the **International Union for Conservation of Nature (IUCN)** and defined in the **UN Convention on Biological**

Diversity as a strategy for the integrated management of land, water and living resources that promote conservation and sustainable use in an equitable way.

- **EbA** comes under the umbrella of **nature-based solutions (NbS)** and is **people-centric** in its approach.
- **Ecosystem-based adaptation (EbA)** in agriculture helps farmers reduce their vulnerability to climate change and overcome its vagaries by harnessing biodiversity and natural resources.
- Small-holder farmers can increase their food security, diversify and increase their sources of income generation, take advantage of local or traditional knowledge and have low implementation and labour costs by adopting **EbA** in **farming**.
- **Ecosystem-based adaptation** is considered to be essential in achieving various **sustainable development goals** and is aligned with the Indian government's **MissionLiFE** programme that encourages people to be **pro-planet**.

Reduce emissions through climate-smart agriculture:

- **Agriculture production** is a **major greenhouse gas emitter** in **India**, accounting for **18%** of the country's total greenhouse gas emissions. Apart from adaptation to climate change, mitigation is another aspect of EbA.
- In the **United Nations Environment Programme's (UNEP) guidelines** for integrating EbA into National Adaptation Plans, **EbA** is acknowledged to be essential in achieving the sustainable development goals of zero hunger, clean water and sanitation, sustainable cities and communities, climate action, life below water and life on land.
- **Digital Green** is a global agricultural development organization.
- One of the programmes of **Digital Green** in Bihar uses the **monitoring, reporting and verification or MRV platform** that ensures a rigorous standard for tracking farmer practices and emissions via calibrated climate models as well as promotes science-backed agriculture practices for reducing agricultural emissions.
- **Farmstack** is an open-source data-sharing platform **AgNext** is for chili quality assaying.

About Mission LiFE:

- The idea promotes an environmentally conscious lifestyle that focuses on '**mindful and deliberate utilization**' instead of '**mindless and wasteful consumption** i.e. Net-zero living or sustainable lifestyle.
- The Mission encourages the **P3 model**, i.e., **Pro Planet People**.
- Advocates for the **circular economy**.
- Mission LiFE makes everyone trustees of the environment.
- **The main objectives enumerated in the LiFE concept** are saving energy at home, cycling and using public transport instead of driving, eating more plant-based food and wasting less, and leveraging our position as customers and employees to demand climate friendly choices.

Topic 28. NUMBER OF ELEPHANTS IN KARNATAKA GOES UP BY 364 FROM LAST CENSUS, TOUCHING 6,395

Important for the subject: Environment

The number of elephants in Karnataka has **increased by 346**, from an estimated **6,049** in **2017** to **6,395** now, which is the highest in the country, according to an interim report on **Asian Elephant population and demography estimates– 2023**.

- Their population range is estimated to be between **5,914** and **6,877**.
- **World Elephant Day** is observed on **August 12** to create awareness about the importance of preserving and protecting these animals that are classified as endangered species.

Synchronised census:

- The census is conducted by the **Karnataka Forest Department** in collaboration with neighbouring **Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, and Goa**.
- The number of elephants in **Karnataka** that had risen from **5,740** in **2010** to **6,072** in **2012** had decreased to **6,049** in **2017** then increased to **6395** in **2023**.

In 23 forest divisions:

- Census was taken up in **23** forest division.
- The State (Karnataka) has an **average elephant density of 0.34 per sq km**. **Bandipur Tiger Reserve** with **1,116 elephants** has accounted for the **highest density of 0.96 per sq km** followed by **Nagarahole Tiger Reserve** that has **831 elephants** with a density of **0.93**.
- **BRT Tiger Reserve** with **619 elephants** accounts for a density of **0.69**, while **MM Hills Wildlife Sanctuary** has a density of only **0.60** despite having **706 elephants**.

Elephant numbers on the rise

Year

Elephants

- 2010 5740
- 2012 6072
- 2017 6049
- 2023 6395
- To know more about Elephant, refer: <http://optimizeias.com/elephant-conservation/> and reserves.

Topic 29. WILDFIRE DESTROYS HAWAIIAN TOWN, LEAVING AT LEAST 36 DEAD

Important for the subject: Environment

Thousands of Hawaii residents raced to escape homes on **Lahaina town (Maui)** as blazes swept across the island, destroying parts of a centuries-old town and killing at least 53 people in one of the deadliest U.S. wildfires in recent years.

- The fires were whipped by **strong winds** from **Hurricane Dora** passing far to the south. It's the latest in a series of **disasters caused by extreme weather** around the globe this summer.
- **Fires in Hawaii** are unlike many of those burning in the **U.S. West**.
- They tend to break out in large grasslands on the dry sides of the islands and are generally much smaller than mainland fires.
- A major fire on the Big Island in **2021** burned homes and forced thousands to evacuate.

Wildfires:

- A wildfire, forest fire, bushfire, wildland fire or rural fire is an unplanned, uncontrolled and unpredictable fire in an area of combustible vegetation.
- Depending on the type of vegetation present, a wildfire may be more specifically identified as a **bushfire** (in Australia), **desert fire**, **grass fire**, **hill fire**, **peat fire**, **prairie fire**, **vegetation fire**, or **veld fire**.
- Some natural forest ecosystems depend on wildfire.
- Wildfires are distinct from beneficial human usage of wildland fire, called controlled or prescribed burning, although controlled burns can turn into wildfires. Modern forest management often engages in prescribed burns to mitigate risk and promote natural forest cycles.

Why are wildfires worsening?

- Wildfires require right climatic conditions, burnable fuel and a spark. Rising temperatures suck moisture out of plants, creating an abundance of dry fuel.
- Drought and high heat can kill plants and dry out dead grass, and other material on the forest floor that fuel the fire once it starts sweeping through a patch.
- While dry vegetation is the burnable fuel that serves as kindling for fires, the spark is sometimes caused by lightning, at other times by accident or recklessness of the local population.

Impact of Forest Fire:

- **Loss of Ecosystems and Biodiversity:** Forest fires destroy the habitats and the intricate relationships of diverse flora and fauna leading to loss of ecosystems and biodiversity.
- **Forest Degradation:** Almost every year, forest fires are witnessed across different forest regions which persistently reduce the quality of certain forest features like soil fertility,

biodiversity, and ecosystems.

- **Air Pollution:** The huge clouds of smoke instigated by wildfires lead to massive air pollution.
- Wildfire smoke, and particularly the concentration of PM 2.5, or particles smaller than 2.5 microns, can also affect the respiratory and cardiovascular systems
- **Global Warming:** When plant life is exterminated by fires greenhouse gasses increase in the atmosphere leading to climate change and global warming
- Trees and vegetation when burned, it means more greenhouse gases increase in the atmosphere, resulting in global warming.

Soil Degradation:

- Forest fires kill beneficial soil microorganisms that are responsible for breaking down the soil and promoting soil microbial activities.
- The burning of trees and vegetation cover also leaves the soil bare making it readily vulnerable to soil erosion.

Topic 30. IN A WARMER, WETTER WORLD, PESTS ARE MULTIPLYING FASTER AND DAMAGING CROPS SEVERELY

Important for the subject : Environment

In April, **tea planters** from **southern India** sought urgent government intervention, saying that the **tea mosquito bug** is causing havoc in the most unlikely places.

- The **United Planters Association of Southern India (UPASI)** has issued a press release that states the **tea mosquito bug (species of Helopeltis)** is affecting **tea production** in **both low and high elevation plantations** in **northern and southern states**.
- In a **2013 study** the scientists write that in **India**, such warming is likely to result in **pest attacks** on **staple crops** such as cotton, wheat, barley, oats, rice, pulse crops, maize, sorghum, oilseed and vegetables, on which a majority of the population relies for daily nutrition.
- They have **identified pests** such as mealy bug, whitefly, tobacco caterpillar, cereal aphids and plant hoppers as the major threats to crops, along with leaf folders, Lepidopterous pod borers, spider mites and other kinds of aphids.
- The **UN Food and Agriculture Organization (FAO)** estimates that **15 plant pests** have spread and may expand further owing to climate change. The increase in agricultural pests due to climate change directly attacks **FAO's target of achieving 50 per cent food production by 2050** to feed an estimated population of 9.1 billion.

Tea mosquito bug:

- The bug, recognised as a **serious pest of fruits and tea plantations** across the world, is usually confined to **low elevation areas**.
- Now, it is spreading to plantations in high elevation areas.

Increasing presence of pests across India:

- **Helopeltis theivora**, the most predominant tea mosquito bug species in India, is spreading in an alarming form in tea plantations of Tamil Nadu's Anaimalai and Valparai hills.
- In Tamilnadu's Valparai hills, the tea production has declined by 50%. Sikkim has recorded the first infestation of **H theivora** in red cherry pepper.
- **H bradyi**, which has so far been restricted to Peninsular India, was reported for the first time in the high altitude Tura region of Meghalaya.
- **H antonii**, which causes damage to cashew crops, is now being reported in Gujarat, Chhattisgarh and Odisha. Tidda (leafhoppers) and silverleaf whitefly (*Bemisia tabaci*) are damaging the wheat, millets, mustard, vegetables and pulse crops in Rajasthan region.

New challenges:

- As these insects and pests are new to the farmers, so they have to face several new challenges like:
- Usage of chemical pesticide instead of organic pest. Since farmers are unable to identify the pests, they are unable to take remedial actions.
- Shifting rainfall is causing the stay of pests longer than usual. Changes in soil conditions.

Warming, a multiplier:

- Unlike humans who have a single generation of about 60 years, insects with shorter life cycles tend to adapt and mutate their DNA at a faster rate.
- It is estimated that the insect's generation may increase by one to five for every 2°C rise in temperature.
- The insects will attain accelerated metabolic rates, leading to faster consumption of nutrients, and shorten the time of diapause—when insects display reduced food intake due to overwintering.
- The impact of warming will profoundly affect aphids—soft-bodied insects that suck into plant saps to deform leaves and flowers.
- About 250 aphid species are recognised as crops pests for agriculture, as they can affect multiple crops of different plant families. They are also known to transmit plant viruses.
- Aphids are found across the world and have the ability to migrate up to 1,300 km, typically during spring and autumn seasons. Since they are sensitive to changes in ambient temperatures, this will translate to changes in their lifecycle.

CO2 concentration:

- The increase in carbon dioxide concentrations in the atmosphere will aggravate the abundance and behavior of herbivorous insects.
- Carbon dioxide emissions enable increase in photosynthesis, leading to higher

accumulation of sugar and starches on leaves. This may favour insect attacks and their propagation.

Indian scenario:

- In India, which is home to **6.83 per cent of the world's insect species**, 1°C rise in temperature would enable them to expand in presence about 200 km northwards and 40 meters upward in terms of altitude. The areas that are not favorable at present due to low temperature may become conducive with rise in temperature.

Topic 31. LESS THAN 1% MITIGATION & ADAPTATION FUNDING WENT TO WORLD'S INDIGENOUS GROUPS DESPITE MORE COMMITMENT: REPORT

Important for the subject : Environment

A new report summarizing the first phase of implementation of the **Inclusive Conservation Initiative (ICI)**, endorsed in January 2022, highlights that while there is mounting evidence on the potential of Indigenous Peoples and local communities in improving conservation, in total, donors have directed less than 1 per cent of climate change mitigation and adaptation funding to IPs and LCs.

Report findings:

- The report, which was launched on **August 9, 2023** on the **International Day of the World's Indigenous Peoples**, said that if the world seeks to realize the rights and priorities of IPs and LCs, significant scaling is needed.
- While **Indigenous Peoples** own or manage an estimated **25 per cent** of the **world's land surface**, including **40 percent of terrestrial protected areas** and **37 per cent of ecologically intact landscapes**, recent assessments estimate that **only 7 per cent of \$1.7 billion** in pledged funding is going directly to Indigenous groups.

Demand for representation:

- **Indigenous Peoples' groups** from around the world, including **India**, called for representation on the **Transitional Committee (TC)** for the establishment of a **Loss and Damage Fund (LDF)**.
- The committee is composed of **24 members**, **10** of whom are from **developed countries** and **14** from **developing countries**.

Inclusive Conservation Initiative (ICI):

- The ICI supports **IP** and **LC**-designed and -led activities that protect biodiversity and result in other global environmental benefits.
- Supervision and technical guidance are provided by **Conservation International (CI)** and the **International Union for the Conservation of Nature (IUCN)**, serving as **joint GEF Implementing Agencies**.

GEF Inclusive Conservation Initiative.

- A concept for the Inclusive Conservation Initiative was approved by the **GEF Council** in **December 2019** and the project proposal was endorsed by the **GEF** in **January 2022**.

Objective:

- The goal is to enhance Indigenous Peoples' and Local Communities' (IPs and LCs) efforts to steward land, waters and natural resources to deliver global environmental benefits.

Topic 32. AMAZON RAINFOREST | THE SCRAMBLE TO SAVE THE PLANET'S LUNGS

Important for the subject : Environment



The **Amazon Cooperation Treaty Organization (ACTO)** meeting was held in **Belem do Para, Brazil**.

- Countries include:** Bolivia, Colombia, Peru, Venezuela, Guyana, Suriname and the French Guiana.
- The outcome of this meeting was the “**Belem declaration**”, which called for cooperation between the countries to ensure the survival of the humongous **Amazon rainforest**, that constitutes a significant portion of these countries, by conserving its biodiversity and natural resources.

Belem declaration:

- It called for the advancement of **debt-for-climate action**, financed by developed countries.
- It promised concerted efforts to arrest deforestation by illegal mining and logging, bring about integrated fire management, besides law enforcement for protecting the rights of Indigenous people inextricably linked to the rainforest ecosystem.

- It called for inviting development banks in the region to work together by pooling funds into a **green coalition** and which shall provide for conservation and employment and income opportunities for poorer people linked to the Amazon's economy.

Drawbacks:

- It does not clarify the goals such as the protection of 80% of the forest from deforestation and degradation (as proposed by Colombia) or zero deforestation by 2030.

‘United for Our Forests’ declaration:

- In this declaration the governments of these countries reaffirmed the imperatives from the previous declaration related to **arresting deforestation** and the **need for sustainable economic practices** to go with environmental protection.

Amazon Cooperation Treaty Organization (ACTO):

- Established: **25 February 1995**
- Headquarters: **Brasília, Brazil**
- The **Amazon Cooperation Treaty Organization (ACTO)** is an international organization aimed at the promotion of sustainable development of the Amazon Basin.
- The **Amazon Cooperation Treaty (ACT)** was signed on **3 July 1978** and amended in **1998**.
- **Group members** — Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela.

Amazon rainforests:

- The **Amazon rainforest** or **Amazonia** constitutes close to **1.3%** of the planet's surface and **4.1%** of the earth's land surface, but as a biome, the Amazon is host to **10%** of the world's wildlife species and some more, as we are still discovering new species in this epic mass of life in Latin America.
- Some of the species found in the **Amazon** are not found anywhere else.
- The **Amazon** itself is the **largest river** by volume of water in the world, draining from **Iquitos in Peru**, across **Brazil** and discharging into the **Atlantic ocean**.
- **Countries with amazon rainforests:** **60%** of it is in **Brazil**, **13%** is in **Peru**, **8%** in **Bolivia**, **7%** and **6%** respectively in **Colombia** and **Venezuela**, and nearly **3%** each in **Guyana** and **Suriname** and around **1%** in **French Guiana** and **Ecuador**.

Ecological contributions:

- In all, by storing around **76 billion tonnes of carbon**, the Amazon rainforest helps stabilise the world's climate.
- **Moisture from the Amazon** is responsible for **rainfall** for many parts of Latin America, contributing to agriculture, storage of water in urban reservoirs as well.

Deforestation in Amazon rainforests:

- The carbon emissions from the Amazon increased by **117 percent** in **2020** compared to the **annual average for 2010 to 2018**.
- **Deforestation** is pushing it dangerously close to a “**tipping point**”, beyond which trees would die off and release their carbon stores back into the atmosphere, with catastrophic consequences for the climate.
- **Brazil**, which holds around **60 percent** of the **Amazon**, has pledged to eradicate illegal deforestation by 2030.
- **Deforestation** has already wiped out around **one-fifth** of the rainforest.

Savannization:

- If 20% or 25% of the forest is destroyed, the forest will enter a process of savannization and that would represent the death of the forest.

Way forward:

- Countries can emulate the **European Union’s law** that requires **EU-based companies** to ensure their imports are “**deforestation-free**”.

Topic 33. FLYING FOX BATS FOR VIGILANCE WHILE DAY-ROOSTING, FINDS STUDY

Important for the subject :Environment

India’s largest species of bats, named after a canine fabled to be sly, spends 7% of its day-roosting time being environmentally vigilant, a new study has said.

Flying fox bats:

- **Pteropus** (suborder Yinpterochiroptera) is a genus of **megabats** which are among the **largest bats in the world**.
- They are commonly known as **fruit bats** or **flying foxes**, among other colloquial names.
- They live in **South Asia, Southeast Asia, Australia, East Africa**, and some **oceanic islands** in the **Indian and Pacific Oceans**.
- **Flying foxes** eat fruit and other plant matter, and occasionally consume insects as well.
- They locate resources with their keen sense of smell. **Most, but not all, are nocturnal**. They navigate with keen eyesight, as **they cannot echolocate**. There are at least 60 extant species in the genus.
- They are generally considered a **vermin** as they raid orchards.
- It had a similar official status under the **Schedule V** of the **Wildlife (Protection) Act of 1972** until it was put on the **Schedule II list**, entailing a higher degree of protection.

Ecological role:

- It is a **keystone species**.

- A **keystone species** is one that has a disproportionately large effect on its natural environment relative to its abundance, impacting many other organisms in an ecosystem and helping to determine the types and numbers of other species in an ecological community.
- It causes **seed dispersals** of many plants in tropical systems.
- Vigilance behaviour.
- Being external roosters, the **flying fox** is exposed to predators and disturbances apart from environmental indicators such as heat and light.

Threats:

- The biggest threat to the **flying fox** is from **humans**. **Hunting for meat** and **medicine** and probable threats like the **felling of roost trees** have contributed to the dramatic decrease in the population of the species.

Topic 34. ON A BUMPY ROAD TO NET ZERO, TRUCKS SHIFT GEAR TO REDUCE EMISSIONS

Important for the subject : Environment

Diesel trucks that are the core of India's domestic freight movement also contribute to the transport sector's emissions.

The move to **zero-emission trucks** could lead the way as India pushes to meet its **2070 net-zero targets**.

High upfront costs, clarity on charging infrastructure and effective communication with fleet owners in the primarily unorganized trucking sector are some of the challenges to overcome in the transitioning sector.

Emissions from truck transport:

- India is poised to become the **world's second-largest trucking market** in the next decade.
- A single truck is projected to emit a total of **1,300 tonnes of CO₂** over its operational lifespan.
- India has approximately **four million trucks** (as of 2022). These trucks shoulder **70% of India's freight demand**, transporting over **4.6 billion tonnes** annually.
- Despite comprising just **2%** of the total vehicles on Indian roads, these freight trucks collectively contribute to **45%** of the transport sector's emissions.
- Almost all the emissions from the **transportation sector** — **90%** — is from **road transport**, with trucks accounting for **approximately 50%** of these emissions.
- A projected fleet of 17 million trucks is envisioned to be on Indian roads by 2050.

Zero Emission Trucks as a Solution:

- Enhancing the efficiency of **Internal Combustion Engine (ICE)**.

- **Zero Emission Vehicles Emerging Markets Initiative (ZEV-EMI)** and Indian government's **E-FAST** (Electric Freight Accelerator for Sustainable Transport) initiative.
- The **zero emission trucks** or **Electric trucks**, though currently at the concept stage, these trucks can help achieve India's target of achieving **Net Zero emission by 2070**.
- **ZETs** can lead to **2.8-3.8 gigatonnes of cumulative CO2 savings** through **2050**, which is equal to or greater than India's entire economy-wide annual GHG emissions today.
- The **ZEV Emerging Markets Initiative (ZEV-EMI)**, launched jointly by **WBCSD** and the **U.S., U.K.** and governments under the ZEVTC, aims to elevate cooperation between governments and businesses in EMDEs to accelerate the transition to ZEVs
- During the **G20 Energy Ministers' meeting**, the **World Economic Forum** announced the launch of **India's pioneering zero-emission road freightcluster initiative**.
- In partnership with the **Ministry of Ports, Shipping and Waterways** and supported by **NITI Aayog's e-FAST program**, this initiative aims to deploy **550 ZETs** within the next 18-24 months, along select road corridors in **Gujarat** and **Maharashtra**.
- **Tata Motors**, dominating nearly **50%** of India's truck sales market, has committed, in its latest annual report, to achieving net-zero emissions for its commercial vehicles by 2045.

Challenges include:

- India's truck market is largely unorganized sector.
- High upfront cost
- Lack of financial incentives
- Currently, **trucks are not included** in any demand incentive schemes, whether it's the **Faster Adoption and Manufacturing of Electric Vehicles (FAME) subsidy**— a scheme that provides incentives to buyers of electric vehicles — or **state-level EV policies**. Unavailability of high-capacity charging infrastructure.

International Council on Clean Transportation (ICCT):

- The **International Council on Clean Transportation (ICCT)** is an **independent nonprofit organization** founded in **2001** to provide first-rate, unbiased research and technical and scientific analysis to environmental regulators.
- Together, these efforts are projected to result in billions of tons of carbon dioxide reductions and prevent thousands of premature deaths over the next decade and beyond.

E-FAST initiative:

- **NITI Aayog**, in collaboration with **World Resources Institute (WRI), India**, launched the country's **first** national electric freight platform – **e-FAST India** (Electric Freight Accelerator for Sustainable Transport – India).
- Supported by the **World Economic Forum, CALSTART** and **RMI India**, the platform brings different stakeholders together, from across the freight ecosystem.
- The platform **aims** to raise awareness on freight electrification bolstered by onground demonstration pilots and evidence-based research.

Topic 35. THE PUSH TO BRING THE PRIVATE SECTOR INTO MINERAL EXPLORATION

Important for the subject: Geography

On August 2, Parliament passed the Mines and Minerals (Development and Regulation) Amendment Bill, 2023, in a bid to attract private sector investment in the exploration of critical and deep-seated minerals in the country.

How do imported critical minerals affect India's manufacturing, clean energy, and technology sectors?

Global Supply Chain Vulnerabilities:

- The Russian-Ukrainian conflict emphasized the susceptibility of global supply chains to shocks, resulting in scarcity and price surges.

Mineral Significance:

- Minerals are pivotal for manufacturing, infrastructure, and clean energy transitions.

Importance of Critical Minerals:

- Essential minerals such as lithium (referred to as '**white gold**'), cobalt, graphite, and rare earth elements (REEs) underpin electric vehicle batteries, electronics, defense systems, and renewable energy technologies.

Projected Demand:

- A World Bank study forecasts an astounding 500% surge in demand for critical metals, like lithium and cobalt, by 2050.

China's Dominance and Dependency:

- China's significant ownership of cobalt mines in the **Democratic Republic of Congo** and its substantial REE reserves accentuate the world's reliance on specific supply sources.

India's Reserves and Production Gap:

- Despite holding 6% of global rare earth reserves, India contributes just 1% to global output.

Mineral Security Partnership (MSP):

- Major economies, including the US, UK, and EU, have formed the MSP to secure supply chains and reduce reliance on specific countries like China.

Why is private sector participation needed for the exploration of critical and deep seated minerals?

Geological Potential:

- India's geological history and tectonic context offer similar mineral exploration prospects to resource-rich regions like **Western Australia and Eastern Africa**. India has explored only 10% of its **Obvious Geological Potential (OGP)**, less than 2% of which is mined.

Stages of Mineral Exploration:

- Mineral exploration comprises several stages: **reconnaissance, prospecting, general exploration, and detailed exploration**.

Government Monopoly and Limitations:

- Historically, government entities dominated mineral exploration, hampering private sector involvement.

Role of the Private Sector:

- The Mines and Minerals Amendment Bill seeks to expedite exploration by fostering private-sector engagement.

Global Model:

- Countries like **Australia** leverage private mining companies, often called "**junior explorers**," to assume exploration risks and discover potential mines.

Bill's Objective:

- The Bill aims to align **India's exploration practices with developed nations** by bolstering private sector participation.

Global Trend:

- Prominent economies strive to **safeguard critical mineral supply chains** and reduce reliance on specific countries.

Has India's existing mining policy encouraged private participation?

Early Recognition of Private Investment:

- India acknowledged the significance of private and foreign investment in mining since **1993**.

Private Exploration Momentum:

- Corporations like **Rio Tinto India, Hindustan Zinc, and De Beers India** engaged in exploration ventures targeting diamonds, zinc, copper, and bulk metals.

Exploration Slump and Supreme Court Intervention:

- Exploration activities waned after 2010 due to apprehensions about **favoritism and misuse of resource allocation**.

Supreme Court's Ruling:

- In 2012, the Supreme Court mandated transparent and reasonable methods, like auctions, for resource distribution.

Amendments to MMDR Act:

- The 2015 amendments allowed private firms to acquire Mining Leases or Composite licenses via government auctions.

Challenges in Auctions:

- The **Evidence of Mineral content (EMT) rule** restricted private participation in early-stage exploration.

How does the Mines and Minerals Bill 2023 encourage private players?

Opening Up Exploration:

- The Bill **excludes six atomic minerals** from the restricted list, enabling private exploration and mining.

Expanded Activities:

- Prohibited activities during reconnaissance, such as pitting, trenching, drilling, and sub-surface excavation, are now **permitted**.

Exploration License (EL):

- The Bill introduces the **Exploration License (EL)**, granted by state governments through competitive bidding.

Auction Mechanism:

- Explorers bid for a **percentage of the auction premium**, with the lowest bid winning the exploration license.

Mineral Scope of EL:

- The EL covers **29 minerals**, including **critical, strategic, and deep-seated minerals**.

Exploration Guidelines:

- The Bill provides guidelines on exploration areas, retention, and related activities.

Central Government Involvement:

- The central government reserves auctions for **specified critical and strategic minerals**.

What are some of the possible issues with the Bill's proposals?

Revenue Generation Uncertainty:

- The primary revenue source for private exploration licenses relies on operationalized mines, leading to revenue delays due to regulatory clearance timelines.

Operational Delays:

- Complex regulatory clearances can extend the timeline for revenue generation.

Auction Suitability for Exploration:

- The auction mechanism might not be suitable for early-stage exploration licenses.

Investment Hesitation:

- Private explorers might hesitate to invest without assurance of resource utilization.

Divergence from Global Practices: The Bill's approach diverges from international practices, where private explorers can directly sell their discoveries to mining companies.

United Nations Resources Classification and Why is Lithium called 'White Gold'?

UN Classification:

- The United Nations Framework for Classification of Resources G1 (Detailed Exploration), G2 (General Exploration), G3 (Prospecting), and G4 (Reconnaissance).

Lithium as 'White Gold':

- Due to its **importance in technologies** such as lithium-ion batteries, electric vehicles, and renewable energy storage solutions. This nickname reflects its economic significance akin to traditional precious metals.

Which minerals, are designated as "critical and strategic" and are now open for private-sector exploration?

1. Lithium
 2. Beryllium
 3. Niobium
 4. Titanium
 5. Tantalum
 6. Zirconium
- These minerals were previously classified as **atomic minerals** and were restricted to government-owned entities for exploration and mining.

Topic 36. STRATEGIES FOR MITIGATING EXTREME FLOODING: CHINA AND SLOVENIA CASES

Important for the subject :Geography

Deadly Flooding in China and Slovenia

China's Impact:

Typhoon Doksuri led to severe flooding and 40+ deaths in northeast China, including historic rainfall in Beijing.

Slovenia's Situation:

- Heavy rain caused flooding, landslides, and a dam breach affecting two-thirds of Slovenia. Other European countries also faced harsh weather.

India's Flood Vulnerability and Management:

- **Monsoon Impact:** Heavy monsoon rains trigger floods, affecting regions like Kerala and Assam. For instance, the 2018 **Kerala floods** led to extensive damage.
- **Himalayan Rivers:** Rapid melting of Himalayan glaciers can cause flash floods, as seen in the 2013 **Uttarakhand disaster**.
- **Urban Challenges:** Poor drainage in cities results in urban flooding during monsoons. **Mumbai's** frequent waterlogging showcases this issue.
- **Deforestation:** Reduced forest cover amplifies flood risk. The 2019 floods in Karnataka's **Kodagu** region highlighted this concern.
- **Coastal Threats:** Coastal areas like **Odisha** face cyclone-induced flooding, such as **Cyclone Fani** in 2019.
- **Climate Change Influence:** Changing weather patterns contribute to increased flood events. **Bihar's annual Kosi River flooding** reflects this trend.

Key Flood Management Strategies:

- **Flood Forecasting:** **Central Water Commission** predicts flood events using river gauges and observatories.
- **Disaster Management Framework:** The Disaster Management Act guides preparedness and response, with the **NDRF** mobilizing during crises.
- **Integrated River Basin Approach:** Sustainable water use balancing agriculture and flood control.
- **Floodplain Zoning:** Regulating construction in flood-prone areas.
- **Infrastructure Development:** Building embankments, dams, and reservoirs.
- **Community Involvement:** Awareness campaigns in flood-prone regions.
- **Climate Resilience:** Adapting strategies to changing flood patterns due to climate change.

Places in News:

Slovenia:

- **Location:** Central Europe, bordered by **Austria, Hungary, Croatia, and Italy.**
- **Coastline:** Small Adriatic Sea coastline (**Gulf of Trieste**), with **Koper** as the main port.
- **Capital:** Ljubljana.
- **Rivers:** Sava, Drava, Mura.

Famous Sites:

- **Lake Bled:** Scenic glacial lake with island and castle.
- **Postojna Cave:** Extensive cave system with formations.
- **Predjama Castle:** Built into a cave mouth.
- **Škocjan Caves:** Canyon and biodiversity.
- **Soca River:** Emerald waters, adventure sports.
- **Piran:** Coastal town with Venetian charm.
- **Triglav National Park:** Alpine landscapes.
- **Geology:** Karst landscape with caves, sinkholes, and rivers.

Mountains:

- **Julian Alps:** Triglav Peak is the highest in Slovenia.
- **Kamnik-Savinja Alps:** Known for diverse scenery.
- **Language:** Official language is Slovene.
- **Mura-Drava-Danube (MDD)** was declared as the world's first 'five-country biosphere reserve' by UNESCO.
- Austria, **Slovenia**, Croatia, Hungary and Serbia

Topic 37. GREEN MINERALS RACE: GHANA APPROVES POLICY TO REAP MAXIMUM BENEFITS FROM MINING PROJECTS

Important for the subject: Geography

Ghana approved a new policy for the exploitation, management and regulation of **lithium** and other **green minerals** in the country, to keep pace with the rising global demand for minerals critical for transitioning to clean energy.

- The **Ewoyaa lithium project** is the **first lithium-producing mine** in **Ghana** being developed by **Atlantic Lithium**, a **Sydney-based, Africa-focused lithium exploration and development company**.
- Recently, **Namibia** and **Zimbabwe** banned the **export of lithium ore**.
- The **Namibia government** banned the bulk export of unprocessed minerals including lithium, graphite and cobalt, known in the industry as **direct shipping ore (DSO)**.
- **Zimbabwe** prohibited export of raw lithium from its mines to stop losing billions of dollars in mineral proceeds to foreign companies.

Key features of the new policy framework:

- Maximum benefits to Ghana from its resources of ‘Green Minerals’.
- Maximum involvement of local people.
- The goal of the policy is to retain a significant proportion of the value chain of these future and other critical minerals in our country, as far as possible.
- It **prohibits** export of critical minerals including lithium, bauxite and iron, among others, in their raw state since this denies the country the opportunity to add real value to the economy.

Green Minerals:

- Often referred to as “**minerals of the future**”, green minerals are metals and other mineral resources that are needed to support the transition to clean energy technologies aimed at reducing carbon emissions.
- These include — **bauxite, cobalt, copper, lithium, granite, manganese and nickel.**

Demand of green minerals:

- According to the **International Energy Agency**, electric vehicles (EV) and battery storage account for about half of the mineral demand growth from clean energy technologies over the next two decades. Mineral demand for use in EVs and battery storage is expected to grow around 30 times in the period to 2040.

Challenges:

- **China’s** dominance over African mining and mineral extraction sectors. Weak domestic governance structures and policy impediments in African nations.

Topic 38. RUZA, A TRADITIONAL WATER HARVESTING SYSTEM FOR THE WATER-SCARCE MOUNTAINS

Important for the subject : Geography

Kikruma, a rainshadow village in Nagaland’s **Phek district**, practices **Ruza**, a **traditional water harvesting system**, to overcome water scarcity and achieve good harvests for nearly a century.

About Ruza- Water Harvesting System of Kirkima, Nagaland:

- The indigenous system of irrigation and agricultural practice in this region, called the **Ruza system**, more popularly known as **Zabo**, is a time-tested unique water management practice that has been yielding good harvests for nearly a century.
- The **Seidzu** and **Khuza rivers** flow to the south and north of the village respectively.
- **Ruza**, means ‘impounding water or run-off water pond or tank for irrigation’ in the **Chokri dialect**. **Zabo** is a small pit dug within a paddy patch, ideally used for rearing fish.
- However, **Ruza** is a larger pond spreading to about 0.2 hectares, used for storing run-off

- water. **Ruza** involves impounding run-off water in ponds, using **gravity-based irrigation**.
- The water harvesting ponds are located at a higher elevation and are connected to the fields at the lower elevations through narrow drains.
 - The **Ruza system** is a communal practice with the water shared among families and an integrated form of farming comprising forestry, horticulture, agriculture, fishery and animal husbandry.
 - **Adopting Ruza** in other hilly terrains with limited rainfall could be a feasible and sustainable alternative in the agricultural sector, say experts.
 - The **Zabo** or **Ruza system** is a **sustainable integrated form of farming** comprising **forestry, horticulture, agriculture, fishery and animal husbandry** with a well-founded soil and water conservation base.
 - The main crop is paddy; about 17 varieties of both sticky and non-sticky rice are cultivated in wet terraces. The yield of paddy is about three to four tonnes per hectare.
 - The indigenous and sustainable farming practice **Ruza**, in **Kikrumba** has been **recognised** by the government as a potential '**Other Effective Area-Based Conservation Measure**' (OECM). An OECM is governed and managed to conserve biodiversity and ecosystem functions, similar to a **Protected Area**.

Rainfed agriculture in India:

- More than half of India's net sown area – 55% of almost **140 million hectares** – is primarily dependent on rainfall, according to the **National Rainfed Area Authority (NRAA)** under the **Ministry of Agriculture**.
- Rainfed agriculture accounts for around **40%** of the country's **total food grain production** and supports **two-thirds** of **livestock** and **40%** of the **human population**.
- Hence, it is a crucial contributor to the country's economy and food security. The livelihoods of 80% of small and marginal farmers are linked to rain.

Topic 39. NGT ASKS ODISHA GOVERNMENT TO STOP 'ILLEGAL' CONSTRUCTION IN AND AROUND TAMPARA LAKE

Important for the subject : Geography

The **National Green Tribunal, Eastern Zone**, has directed the **Odisha government** not to go ahead with '**illegal**' construction in and around **Tampara Lake**, a designated **Ramasar site** and **one of the largest picturesque freshwater lakes** of the State.

Tampara lake:

- Spread across **337.86 ha** with a length of 5.8 km and a width of 670 metres in **Ganjam district**, **Tampara Lake** supports **at least 60 species of birds, 46 species of fishes, at least 48 species of phytoplanktons**, and more than seven species of terrestrial plants and macrophytes. There is a patch of forest with a width of 2 km that separates Bay of Bengal from the lake.
- The wetland is an important habitat for **vulnerable species** such as **Cyprinus carpio**,

- **common pochard** (*Aythya ferina*), and **river tern** (*Sterna aurantia*).
- **Tampara** is already placed in the **Wetland Atlas** prepared by the **Ministry of Environment, Forest and Climate Change** in **2010**. All **Ramsar sites** are protected under **Wetland Conservation Rules 2017**.
- The boundaries of the Ramsar Site (Tampara) correspond to the peak inundation area and the fringe hydrophytic vegetation bordering several parts of the shoreline. It is a violation of wetland conservation rules on part of the State government for coming up with concrete structure along the lake.

Topic 40. NORTH INDIA MORE AFFECTED BY EL NINO

Important for the subject : Geography

A study suggests that the **El Nino Southern Oscillation (ENSO)** affects vast regions of India differently.

- Since **1981** monsoon rainfall over Central India — known as the **monsoon core zone** and where **agriculture is largely rainfed** — is increasingly getting disassociated from the **ENSO** with **only 10% of droughts or excess rains linked to ENSO fluctuations**.
- On the other hand, the **ENSO** link to **North India** was **strengthening**, with **70%** of rainfall fluctuations linked to the **ENSO cycle**. In **southern India**, the relationship has remained largely stable.
- While past research into **monsoon patterns** have suggested a “weakening” of the relationship between **ENSO** and **monsoon**, the latest suggests that this too has varied since 1901. The **ENSO–ISM (Indian Summer Monsoon Rainfall) inverse relationship** started getting **stronger** from **1901** to **1940**, became **stable** from **1941** to **1980** and then the relationship has **weakened** in the **recent epoch** (1981 onwards).

Consequences:

- The **ENSO dominance** over the **core monsoon zone** is **weak**, which means that **seasonal prediction over this region** has become **less predictable** in the recent decades.
- Other factors like **Indian Ocean warming** should be **monitored** for the **core monsoon zone**, due to its impact on the strength of the monsoon trough and the depressions.

Monsoon rainfall in India:

- **Monsoon rainfall**, which accounts for **80% of India’s annual rainfall**, is influenced by **two broad factors**: The **external one** is the impact of **ENSO** which influences the trade winds and their ability to carry warm, moist air towards India around monsoon.
- The other, **internal**, is the ‘**monsoon trough** — an elongated low-pressure area which extends from over Pakistan to the Bay of Bengal.
- This **trough** swings between **north** and **south India** through the **monsoon bringing rain** wherever it is active and is fed on moisture brought in from the **Bay of Bengal** (and the Arabian Sea to a lesser extent) in the form of **low-level cyclones** called ‘**depressions**.’

Topic 41. HOW TO MAKE UREA MORE EFFICIENT AS A FERTILIZER

Important for the subject : Geography

Recently, the PM of India officially launched ‘Urea Gold’ fertilizer – basically urea fortified with sulphur, developed by the state-owned Rashtriya Chemicals and Fertilizers Ltd (RCF).

What is UREA Gold:

- ‘Urea Gold’ is a **new fertilizer** launched by the Indian Prime Minister and developed by **Rashtriya Chemicals and Fertilizers Ltd.**
- It’s made up of **37% Nitrogen and 17% sulphur.**
- This combination **addresses the sulphur deficiency in Indian soils**, particularly beneficial for oilseeds and pulses.
- It offers a **more gradual release of Nitrogen**, ensuring plants remain green longer.
- This means **farmers might need fewer applications**, possibly using two bags instead of three for crops like paddy or wheat.

Why is Urea consumption a concern in India:

- Urea consumption in India has **increased from 26.7 million tonnes** in 2009-10 to **35.7 million tonnes in 2022-23**. Despite measures like mandatory neem coating and reduced bag sizes, there’s been a noticeable uptrend in consumption since 2017-18.
- Out of the **35.7 million tonnes** consumed last fiscal year, **7.6 million tonnes were imported**. Even **domestically-produced urea relies heavily on imported natural gas** as its primary feedstock
- The **Nitrogen Use Efficiency (NUE)** of urea in India is worrying. Only **35% of the Nitrogen applied through urea is actually used by crops**. The **remaining 65% is lost, either released as ammonia gas** or leached into the ground as nitrate.

What are the Government Efforts to Reduce Urea Consumption in India:

- The introduction of the **nutrient-based subsidy (NBS) regime in 2010**.
- Under NBS, the government **fixed a per-kg subsidy** (unlike the earlier product-specific subsidy regime) for each fertilizer nutrient: **Nitrogen (N), phosphorus (P), potash (K) and sulphur (S)**.
- It aims to promote **balanced fertilization by discouraging farmers from applying too much urea (46% N), di-ammonium phosphate (DAP – 46% P plus 18% N) and muriate of potash (MOP – 60% K)**.
- Implementing the **DBT system**, the government directly provides fertilizer subsidies **into farmers’ bank accounts**.
- In **2015**, the Centre made it **mandatory to coat all indigenously manufactured and imported urea with neem oil**.
- This was followed by **replacing 50-kg bags with 45-kg ones in 2018**, and the launch of liquid ‘Nano Urea’ by the Indian Farmers’ Fertiliser Cooperative (IFFCO) in 2021.

- Liquid nano urea is **essentially urea in the form of a nanoparticle** aimed at **reducing the unbalanced and indiscriminate use** of conventional urea, increasing crop productivity, and reducing soil, water, and air pollution.

Topic 42. REFERENDUM NOT AN OPTION UNDER CONSTITUTION: SC

Important for the subject: Polity

Seeking public opinion in a constitutional democracy like India has to be through established institutions. SC said that there is no question of referendum under the country's Constitution.

Constitution:

- It is described as the fundamental law of the land which contains the fundamentals of its polity and on the altar of which all other laws and executive acts of the state are to be tested for their validity and legitimacy.

Constitutionalism

- Constitutionalism implies that the exercise of political power, should be bound by limitations, controls, checks and rules whether these exist in the form of a written or unwritten constitution. Constitutionalism becomes a living reality to the extent that these rules curb the arbitrary exercise of power and permit scope for the enjoyment of certain rights by the citizens.

Types of Direct Democracy

- Direct democracy has 4 devices – Referendum, Initiative, Recall and Plebiscite
Referendum – procedure in which a proposed legislation is referred to the electorate for acceptance through direct voting.
- **Initiative** – method by means of which the people can propose a bill to the legislature for enactment.
- **Recall** – way for voters to remove a representative or an officer before the expiry of his/her term, when he fails to discharge his duties properly.
- **Plebiscite** – method of obtaining the opinion of people on any issue of public importance. It is generally used to solve territorial disputes.

Topic 43. CBI ACADEMY JOINING THE INTERPOL GLOBAL ACADEMY NETWORK

Important for the subject: Polity

The Central Bureau of Investigation (CBI) Academy of India took a significant step towards enhancing international cooperation and bolstering law enforcement efforts by officially joining the **INTERPOL Global Academy Network** on 8 August as its 10th member.

- The move will help enhance regional and global police capacity as well as foster collaboration among law enforcement agencies worldwide.

- Launched in 2019, the **INTERPOL Global Academy Network** is led by **INTERPOL's Capacity Building and Training Directorate** and aims to lead a global approach to law enforcement training.
- By assisting INTERPOL in delivering specialized trainings on its policing capabilities, offering programmes of continuing education, jointly developing and delivering new training programmes, and collaborating on joint research projects,
- Network members support INTERPOL in expanding upskilling opportunities for law enforcement around the globe.
- With a vast training catalogue and expertise, including advanced scientific investigations, cybercrime investigations, cyber forensics, economic crimes and anti-corruption, the CBI Academy of India will enrich the training offer available to INTERPOL member countries in the Asia region and beyond.

CBI

- Central Bureau of Investigation (CBI) is the premier investigating police agency in India.
- It functions under the superintendence of the **of Personnel, Ministry of Personnel, Pension & Public Grievances, Government of India** – which falls under the prime minister's office.
- However for investigations of offences under the Prevention of Corruption Act, its superintendence vests with the Central Vigilance Commission.
- It is also the nodal police agency in India which coordinates investigation on behalf of Interpol Member countries.
- Its conviction rate is as high as 65 to 70% and it is comparable to the best investigation agencies in the world. The International Police Organization is commonly known as Interpol.
- It is an international organization facilitating international police cooperation against cross-border terrorism, trafficking, and other crime.
- INTERPOL has 194 member countries, making us the world's largest police organization. State of Palestine is its member.
- All decisions regarding the activities of INTERPOL are made by the General Assembly which is its supreme governing body which meets annually. It is not a unit or part of united nation system. It is an independent international organization.

HQ: Lyon in France.

- It was founded in 1923. Each country hosts an INTERPOL National Central Bureau (NCB), which links national police with our global network. In India, CBI is the NCB.
- **Interpol notices:** These are international alert/requests circulated by Interpol allowing police in member countries to share critical crime-related information.
- There are eight types of notices, seven of which are colour-coded by their function. An eighth Special Notice is issued at the request of the United Nations Security Council (UNSC).

Topic 44. ROW OVER SELECT COMMITTEE FOR DELHI SERVICES BILL

Important for the subject : Polity

Several MPs complained about their names being included in the proposed Select Committee for the **Delhi Services Bill** without their consent.

Rajya Sabha Deputy Chairman Harivansh initiated a probe into the matter. The proposed committee was suggested by **AAP MP Raghav Chadha**.

What is the purpose of a Select Committee?

- A Select Committee is a **temporary** (ad-hoc) committee established to examine **specific bills**.
- It follows procedures outlined in the **Rules of Procedure**. Constituted by **Parliament** to consider and report on bills referred to them.

How are members selected for a Select Committee?

- Members are **appointed by Parliament when a motion is adopted** to refer a bill to the committee.
- **Rule 125 of the Rajya Sabha** Rules and Procedures allows any member to move an amendment for a bill to be referred to a Select Committee.
- **Consent is required** from the proposed member, and the mover needs to ascertain the member's willingness to serve on the committee.
- Collecting signatures is **not explicitly mentioned** in the rules.

How does a Select Committee function?

- **Quorum** for each sitting is **one-third of the total committee members**. In case of **tied votes**, the chairman or presiding person has a second or **casting vote**.
- The committee can appoint **sub-committees** to examine specific aspects of the bill. **Chairman of the Committee** is appointed by the Chairman of the Rajya Sabha from among the committee members.
- If it is a **Joint Committee**, the proportion of members from the Rajya Sabha and the Lok Sabha is 1:2
- The **member or Minister in charge of the Bill** is generally included as a member of the Committee.
- The **report is signed by the committee chairman**, and dissenting opinions can be recorded.
- The report and dissenting notes are presented in parliament, printed, and circulated among all members.

What is the role of a Select Committee?

- The main task is to **scrutinize the bill's text clause by clause**, ensuring a clear reflection of intent and objectives.

- The committee **can invite experts, gather oral evidence, and have government officials explain provisions.**
- After considering the evidence, conclusions are formulated, and **amendments** may be proposed to clarify intent.
- The Committee **may also visit organizations and institutions** for an on-the-spot study of matters connected with the bill.

What happens after a Select Committee's report is submitted?

- The committee's report is of a **recommendatory** nature. The government can choose to accept or reject the committee's recommendations.
- The committee **can introduce its version of the bill**, which can be discussed and passed if moved by the bill's minister in charge.
- The government's response to the committee's recommendations is usually presented before the bill is further discussed or voted on in the Parliament.

What is a standing committee?

- The Standing Committees are **permanent** (constituted every year or periodically) and work on a **continuous basis**.

Standing Committees can be classified into the following six categories:

- Financial Committees
- Departmental Standing Committees
- Committees to Enquire
- Committees to Scrutinise and Control
- Committees Relating to the Day-to-Day Business of the House
- House-Keeping Committees or Service Committees

What rules govern committees?

- They draw their authority from Article 105 and Article 118.
- **Article 105** deals with the privileges of MPs.
- **Article 118** gives Parliament authority to make rules to regulate its procedure and conduct of business.

What is a Committee on Privileges?

- This is a standing committee consisting of **15 members in Lok Sabha**(10 in **Rajya Sabha**) nominated by the Speaker (Chairman in case of Rajya Sabha). In the Rajya Sabha, the **deputy chairperson heads the committee of privileges.**

Powers and Functions:

- The committee examines every question involving **a breach of privilege** of the House

- or of the members or of any Committee thereof referred to it by the House or by the Speaker/Chairman.
- It also determines with reference to the facts of each case whether a breach of privilege is involved and **makes suitable recommendations** in its report.
 - It also states **the procedure to be followed by the House** in giving effect to its recommendations.
 - When a question of privilege is referred to the Committee by the **House**, the **report of the Committee is presented to the House by the Chairman or, in his absence, by any member of the Committee.**
 - Where a question of privilege is referred to the Committee by the **Speaker**, the report of the Committee is **presented to the Speaker** who may pass final orders thereon or direct that it be laid on the Table of the House.
 - The Speaker/Chairman may refer to the Committee any petition regarding the disqualification of a member on the ground of **defection** for making a preliminary inquiry and submitting a report to him.
 - The procedure to be followed by the Committee in these cases is so far as may be the same as inapplicable to questions of breach of privilege.

Topic 45. WHY WAS J&K CONSTITUTION NEVER BROUGHT ‘WITHIN THE FOLD’ OF THE INDIAN CONSTITUTION, SC ASKS

Important for the subject :Polity

The Supreme Court asked why the Union of India, the Legislative Assembly of Jammu and Kashmir or the political establishment in the rest of the country had never bothered to bring the Constitution of Jammu and Kashmir within the fold of the Constitution of India.

- The court said the **Jammu and Kashmir Constitution** had, over the years, **limited the executive powers of the Union of India** and restricted the legislative reach of the Parliament.
- **Jammu and Kashmir** was the **only State to have a separate Constitution**. It was enacted on **January 26, 1957** and abrogated by the President on **August 5, 2019**.

‘Complete authority’:

- The **1954 Constitution Order**, by inserting **Article 35A** into the Indian Constitution, gave the Jammu and Kashmir State Legislature **“complete authority”** to decide the **‘permanent residents’** of the State and grant them special rights and privileges in State public sector jobs, acquisition of property within the State, scholarships and other public aid and welfare programmes.
- The limitations enumerated in **Article 35A** were reflected in the J&K Constitution.
- **Background:** On **October 17, 1949**, **Article 370** was added to the Indian constitution, as a **‘temporary provision’**, which exempted Jammu & Kashmir, permitting it to draft its own Constitution and restricting the Indian Parliament’s legislative powers in the state.
- It was introduced into the draft constitution by **N Gopala swami Ayyangar** as **Article**

306A.

- **Under Article 370:** The Constituent Assembly of Jammu & Kashmir was empowered to recommend which articles of the Indian Constitution should apply to the state,
- The J&K Constituent Assembly was dissolved after it drafted the state's constitution. **Clause 3** of the **article 370** gives the **President of India** the power to amend its provisions and scope.
- **Article 35A** stems from **Article 370** and was introduced through a **Presidential Order** in 1954, on the recommendation of the J&K Constituent Assembly.
- **Article 35A** empowers the Jammu & Kashmir legislature to define the permanent residents of the state, and their special rights and privileges. It appears in **Appendix I** of the Constitution.

Constitution (Application to Jammu and Kashmir) Order, 2019:

- The **Constitution (Application to Jammu and Kashmir) Order, 2019** has replaced the **Presidential Order of 1954**.
- Subsequently, the **Jammu and Kashmir Reorganisation Bill, 2019**, passed by Parliament divides the state of Jammu and Kashmir into **two new Union Territories (UTs)**:

Jammu & Kashmir, and Ladakh.

- This is the first time that a state has been converted into a UT.
- Of the **six Lok Sabha seats** currently with the state of Jammu and Kashmir, **five will remain with the union territory of Jammu and Kashmir**, while **one will be allotted to Ladakh**.
- The **UT of Jammu and Kashmir will have an Assembly**, like in **Delhi** and **Puducherry**.
- Instead of **29**, India will now have **28 states**. Kashmir will no longer have a Governor, rather a **Lieutenant Governor** like in Delhi or Puducherry.

Topic 46. CHANGE STATE'S NAME TO KERALAM, ASSEMBLY RESOLUTION URGES CENTRE

Important for the subject: Polity

The Kerala Legislative Assembly unanimously passed a resolution urging the Central government to officially change the name of the State from Kerala to Keralam.

The Resolution:

- The Kerala Assembly, led by **Chief Minister Pinarayi Vijayan**, passed a unanimous resolution urging the Central Government to rename the state as "**Keralam**" in both the **official records and the Constitution**.
- Remarkably, the resolution garnered unanimous support from the Assembly, with **no proposed changes from the Congress-led Opposition**.

Name Change Rationale:

- While the state's name in Malayalam is “**Keralam**“, it's designated as “**Kerala**” in the **First Schedule of the Constitution**.
- Tracing back to the days of the **national freedom struggle**, the resolution emphasizes the historical demand for a **unified Kerala for all Malayalam-speaking communities**.
- The Assembly calls upon the Union Government to take action **under Article 3** of the Constitution to align the state's name with its linguistic identity.

Name Origins:

- The term “**Kerala**” finds its historical roots in **Emperor Ashoka's Rock Edict II from 257 BC**, where the local ruler is referred to as “**Keralaputra**”
- On the other hand, “**Keralam**” is believed by scholars to have derived from “**Cheram**,” a perspective proposed by **Dr. Herman Gundert**.
- Dr. Gundert pointed to the **Kannada term “keram”** which is akin to “**cheram**” suggesting the **region between Gokarnam and Kanyakumari**.

Demand for Unified Kerala:

- Emerging during the 1920s, the **Aikya Kerala movement** was a fervent call for the integration of **Malabar, Kochi, and Travancore** into a single administrative entity.
- The movement gained momentum due to the **shared Malayalam language**, cultural traditions, and historical bonds that unified the Malayalam-speaking populace.

Formation Post-Independence:

- The **integration of Travancore and Kochi on July 1, 1949**, marked the initial step towards the establishment of the **Travancore-Cochin State**.
- The **State Reorganisation Commission's** recommendations led to the formation of Kerala, encompassing the district of **Malabar and the Kasargod taluk**. The state of Kerala was officially inaugurated on **November 1, 1956**.

Process of Renaming:

- Changing the name of a state involves obtaining **approval from the Ministry of Home Affairs (MHA) at the Central level**, necessitating a **Constitutional amendment**.
- The procedure is instigated by the state government, and the MHA reviews the proposal after securing **No Objection Certificates (NOCs) from various governmental agencies**.
- If endorsed, the proposal is transformed into a legally binding act through a **parliamentary Bill**.

Steps in the Assembly's Resolution:

- The resolution earnestly implores the Union Government to effectuate the name change from “**Kerala**” to “**Keralam**,” necessitating an amendment to the Constitution as per

Article 3.

- Furthermore, the resolution advocates for the **usage of “Keralam” across all languages listed in the Eighth Schedule of the Constitution.**

Significance of Article 3 and Schedule 1:

- Article 3 of the Constitution, which governs the **creation of new states and the modification of existing states’ boundaries**, serves as the bedrock for altering the state’s name from “Kerala” to “Keralam.”

Article 3

- Formation of new States and alteration of areas, boundaries or names of existing States:
- Parliament may by **law** form a new State by separation of territory from any State or by uniting two or more States or parts of States or by uniting any territory to a part of any State; increase the area of any State; diminish the area of any State; alter the boundaries of any State; **alter the name of any State;**
- Provided that no Bill for the purpose shall be introduced in either House of Parliament **except on the recommendation of the President** and unless, where the proposal contained in the Bill affects the area, boundaries or name of any of the States, the **Bill has been referred by the President to the Legislature of that State for expressing its views** Schedule 1 of the Indian constitution contains the list of states and union territories and their extent and territorial jurisdictions.

Schedule 1 of the Indian Constitution deals with

- Names of the **States and their territorial jurisdiction.**
- Names of the **Union Territories and their extent.**

Amendment to Schedule 1

- Whenever there is a change in the territory of a state/UT or formation of a **new state/UT** or merger of states/UTs Schedule 1 gets amended.
- The first amendment of Schedule 1 was carried out by the **7th Constitutional Amendment 1956** with the formation of the **Andhra Pradesh state.**
- The **recent amendment to Schedule 1** was by the **Jammu and Kashmir Reorganisation Act, 2019** which deleted the Jammu and Kashmir entry from the State list and added “Jammu and Kashmir” and “Ladakh” entries in the Union Territory list of Schedule 1.

Topic 47. INDIAN POST OFFICE ACT 1898, TO BE REPEALED

Important for the subject: Polity

Post Office Bill, 2023 introduced in Rajya Sabha, Indian Post Office Act, 1898 to be repealed.

Post Office Bill, 2023, introduced in the Rajya Sabha. It will repeal the **Indian Post Office**

Act, 1898, and consolidate and amend the law relating to the Post Office in India.

Why the need for a new Act?

- The Indian Post Office Act, 1898 was enacted in 1898 with a view to govern the functioning of the Post Office in India which was primarily related to mail services provided through the Post Office.
- With time the services available through the Post Office have diversified beyond mails and the Post Office network has become a vehicle for delivery of a variety of **citizen centric services**. Further with **India Post Payments Bank** the postal department has entered banking too.
- All this necessitated the repeal of the said Act and enactment of new law in its place.
- The Post Office Bill, 2023 addresses these changes and provides for a simple legislative framework to facilitate evolution of the post office into a **network for delivery of citizen centric services**.

Some of the changes are as follows:

- Empowering post offices employees to **open or detain any item during transmission** in the interest of **national security or public safety**.
- It also prescribed **immunity for post offices employees from liability** in providing services, but with conditions.
- The bill prescribes power to intercept, open or detain any item or deliver it to the customs authority.
- Post Office will be empowered to deliver an item, received from a domestic or international source, to customs or any concerned authority in case there is **suspicion of duty evasion** or it is prohibited under the law.
- The bill has a provision related with recovery of sums due in respect of services provided by the Post Office.
- Post Office shall have the exclusive privilege of issuing postage stamps. Also, the Central Government may prescribe standards for addressing on the items, address identifiers and usage of postcodes.

Topic 48. PRESIDENT MURMU PAYS TRIBUTE TO MATANGINI HAZRA, KANAKLATA BARUA:

Important for the subject : History

During the Presidential address to the nation on the eve of Independence Day, President Droupadi Murmu paid tributes to women freedom fighters like Matangini Hazra, Kanaklata Barua.

- She was **born in a village named Hogla, near Tamluk, on 19th October 1869**. She was **married at 12 to Trilochan Hazra**, a 60-year-old man from Alinan village in Medinipur.
- By age of 18, **Matangini Hazra was widowed**, without any children.
- In **1905**, she became **actively interested in the Indian Independence Movement**, her

source of inspiration being Mahatma Gandhi.

- In **1932**, she took part in the **Civil Disobedience movement** and was arrested for breaking the **Salt Act**.
- After being released, she became an **active member of the Indian National Congress** and took to spinning her own Khadi.
- People fondly started calling her **Gandhi Buri (Old Lady Gandhi)** for her dedication towards Gandhian principles.
- In **1933** when **Sir John Anderson**, Governor of Bengal **visited Tamluk** to address a public gathering, Matangini craftily managed to avoid the security and reach the dais where she **waved a black flag**. She was awarded **six months rigorous imprisonment** for her bravado.
- She died on **September 29, 1942**, while leading a procession of around 6000 supporters towards Tamluk police station.

Who was Kanaklata Barua:

- She was born on **22 December 1924** at **Borangabari, Assam**
- During the Quit India Movement, Kanaklata Barua led a **group of protesters, carrying** the national flag, in an attempt to hoist it at the **local police station in Gohpur** on **20 September 1942** and was shot by the police during an altercation.
- She had joined the **Mrityu Bahini** just two days before the incident. The Fast Patrol Vessel **ICGS Kanak Lata Barua** of the Indian Coast Guard, **commissioned in 1997**, was named after Barua.

Some other female freedom fighters during Quit India Movement:

- **Aruna Asaf Ali:** Aruna Asaf Ali, also known as the “**Grand Old Lady**” of the Indian independence movement, was an active participant in the Quit India Movement.
- She worked to organize **underground activities**, distribute pamphlets, and mobilize people against British rule.
- **Sucheta Kriplani:** Sucheta Kriplani was a prominent freedom fighter and a leading figure in the Quit India Movement. She was known for her **organizing skills and leadership in various protest activities**.
- **Usha Mehta:** Usha Mehta was a dedicated freedom fighter who played a significant role in **organizing and broadcasting underground radio messages** during the Quit India Movement. She used her technical skills to spread the message of independence.
- **Kamla Devi Chattopadhyay:** Kamla Devi Chattopadhyay was a prominent social reformer and freedom fighter. She participated actively in the Quit India Movement and worked to unite women in the struggle against British rule.
- **Rajkumari Amrit Kaur:** Rajkumari Amrit Kaur was a key figure in the Quit India Movement and an active member of the Indian National Congress. She also contributed to the Quit India resolution and was arrested during the movement.
- **Tara Rani Srivastava:** Tara Rani Srivastava was a notable Indian freedom fighter who actively participated in the **Quit India Movement** and made significant contributions to

India's struggle for independence. In **1942**, **she and her husband** were leading a march in **Siwan** towards the police station when he was shot by police.

Topic 49. 'THERE IS NO LINK BETWEEN LORD MAYO'S ASSASSINATION AND THE CRIMINAL TRIBES ACT'

Important for the subject :History

Richard Bourke, 6th Earl of Mayo, a British statesman and prominent member of the British Conservative Party who served as **Chief Secretary for Ireland** (1852, 1858-9, 1866-8) and **Viceroy of India** (1869-72) was the **only Viceroy** to be assassinated in India during his tenure.

- **Mayo**, after whom **Mayo College** in **Ajmer** is named, remains the only British Indian Viceroy to be assassinated.
- His assassination had led to the creation of the **first intelligence bureau** in colonial India.
- It also led to the birth of Continental cuisine in the country. Just a year before the assassination on **February 8, 1872**, the colonial government had passed a law that was to have implications for thousands of Indians:

The Criminal Tribes Act, 1871.

- The law declared that certain Indian groups were habituated to a life of crime and should be punished severely. The stigma created by the law lingers to this day.
- He was assassinated by **Sher Ali Afridi**, the **Pashtun** from the **restive Northwest Frontier Province** of British India.

As Viceroy of India Lord Mayo was responsible for the following actions:

- Lord Mayo stabilized the **northwestern frontier of India** by cultivating closer relationships with **Sher Ali, the emir of Afghanistan**.
- He did this with the hope of negating Russian influence in the region and ensuring a buffer state would exist between the Russian and British Empire.
- He ordered the **first census of India in 1871** which produced a general picture of various peoples of the subcontinent and their population size.
- Setting up of **Department of Revenue, Agriculture and Commerce** Introduction of the most improved rifle, the Snider, and of rifled guns for the artillery.
- Improvement in the **sanitary conditions for the troops**. infrastructure development in the country by which an immense extension of roads, railroads, and canals was carried out.
- **Lord Mayo** took interest in the **Prison reforms**, especially the convict settlements at the Andaman Islands.
- The most important legal reform during his time was the passage of the **Indian Evidence Act in 1872**.
- The act removed this anomaly and differentiation and introduced a standard set of law applicable to all Indians. Earlier the law system was differentiated and was applied as per

the caste, community and social group in question.

The political climate of British India in the year 1872:

- Various political murders took place in 1872.
- The attack on **Justice John Paxton Norman** on the steps of Calcutta Town Hall on September 20, 1871.
- Some rules affected the religious freedom of some groups and sects. The **Wahhabi movement** was seen as a threat to British rule and their plans for expansion of the Empire. Many prominent Wahhabi leaders were sent on sentences of transportation for life to the penal colony of Andamans during the Ambala trials of 1864.
- **Justice Norman** was known to have passed harsh sentences against **Wahhabis** and sent them to the Andamans. It is believed that **Mohammed Abdullah**, who killed Justice Norman, was a **Wahhabi sympathiser**.

Why did Sher Ali Afridi assassinate Mayo?

- There is no proof that **Sher Ali** fought on behalf of the British during the **Great Uprising of 1857**.
- He was an **Afridi tribesmen** hailing from **Jamrud**. He was described as working as an orderly for Colonel Pollock who was a British officer posted in Peshawar.
- He was charged for murder by British law and sentenced to death which was later commuted to transportation for life and sent to Andamans.
- He was known to be a **mild, soft-spoken person of affable nature** because of which he earned a ticket-of-leave and lived at Hope Town working as a barber.
- It is possible that he was indoctrinated during this period with **Wahhabi ideals** and decided to **kill Lord Mayo**.
- During interrogation after the **murder of Lord Mayo**, **Sher Ali** is believed to have said he had no personal enmity with Lord Mayo and he killed him because God told him to do so.

There are claims that Sher Ali Afridi was part of a Jihadist plot and that he was influenced by Wahhabism:

- **Sher Ali** was surely influenced by the Wahhabis in Port Blair but he was not a jihadist. **Sher Ali** grew up in the **Pashtun areas** bordering **Afghanistan** in the years after the **First Afghan War**.
- The **Afghans** had **massacred** the **British Army** during the earlier part of the war. When the 'Army of Retribution' was sent to take revenge for that and to consolidate British influence in **Afghanistan**, terrible atrocities were committed on the **Afghan people** by the British Indian army.

Is there any link between the Criminal Tribes Act and Assassination of Mayo?

- The **Criminal Tribes Act** was mainly used against some tribes who were accused of

pursuing crimes like robbery, dacoity, counterfeiting, etc, as hereditary professions.

- There was not any connection between the **Criminal Tribes Act** and the **assassination of Lord Mayo**. The transportation of some ‘**criminal tribes**’ like the **Bhattus** and **Bhantus** to the **Andamans started much later, around 1920**.
- **Sher Ali** was an **Afridi, a Pashtun tribesman** for whom ‘**honour**’ was most important. They were never branded as a ‘**criminal tribe**’ by the British.

Topic 50. INTERNATIONAL DAY OF THE WORLD’S INDIGENOUS PEOPLE

Important for the subject: Schemes

The **International Day of the World’s Indigenous People** is observed on **9 August** each year to raise awareness and protect the rights of the **world’s indigenous population**

History of World Tribal Day

- The International Day of the World’s Indigenous Peoples is to be marked annually on August 9, according to a decision made by the UN General Assembly in December 1994.
- The day was picked in honour of the 1982 Geneva-based Working Group on Indigenous Populations of the UN Sub-Commission on the Promotion and Protection of Human Rights inaugural meeting, which served as the inspiration for the date.

World Tribal Day 2023 theme

- The theme of World Tribal Day in 2023 is “Indigenous Youth as Agents of Change for Self-determination.”

Significance of World Tribal Day

- The International Day of the World’s Indigenous Peoples holds immense significance as it serves to spotlight the rich cultural diversity, heritage, and contributions of indigenous communities globally. The day is necessary since indigenous peoples are frequently among the most underprivileged racial and ethnic groupings in society.
- The UN estimates that although indigenous people make up less than 5% of the global population, they are responsible for 15% of the world’s poorest people.

‘Adivasi’ in India

- In India, the term ‘Adivasi’ is used to encompass a diverse range of ethnic and tribal communities that are regarded as the original inhabitants of the country.
- These tribal groups make up approximately 8.6% of India’s overall population, which amounts to around 104 million individuals as per the 2011 census.
- Although the most substantial tribal communities are concentrated in central India, they constitute merely about 10% of the total population in that region.

Topic 51. 14 STATES YET TO JOIN CENTRE'S FLAGSHIP EDUCATION SCHEME

Important for the subject :Schemes

Introduction

Kerala, Tamil Nadu, and West Bengal among 14 States and Union Territories not signed **PM-USHA scheme MoU** with Union Education Ministry.

- MoU mandates implementation of **National Education Policy (NEP)** for availing funds of ₹13,000 crore over 3 years.
- Opposition-ruled States express **concerns due to 40% budget responsibility and no extra funds for NEP reforms**. Centre engaging in **discussions** to resolve differences with dissenting States.

PM-USHA scheme: Enhancing Higher Education Quality

- **PM-USHA (Pradhan Mantri Uchchatar Shiksha Abhiyan)** aims to improve State University higher education quality.
- Involves **curriculum changes, teacher training, infrastructure enhancement, accreditation, and employability improvement**.
- Outlay of ₹12,926.10 crore allocated between 2023-24 and 2025-26. MoU signifies States' willingness to participate in PM-USHA for better implementation.

Importance of NEP Reforms and Funding Concerns

- MoU mandates States to implement **administrative, academic, and governance reforms in NEP**.
- Reforms include **academic credit bank, entry-exit flexibility, Samarth egovernance platform**. Some States express **concern over lack of extra funds for NEP changes**.
- **Evolution of RUSA to PM-USHA:** Rashtriya Uchchatar Shiksha Abhiyan (RUSA) aimed to enhance access, equity, and excellence in **state higher education** with efficiency, transparency, and responsiveness.
- Launched in **2013 (Phase 1) and 2018 (Phase 2)**. Transitioned to Pradhan Mantri Uchchatar Shiksha Abhiyan (**PM-USHA**) due to National Education Policy (**NEP**) influence.

Coverage and Expansion:

- Encompasses government and government-aided institutions in States and UTs. Responds to increasing demand for higher education and growth in institutions and students.

Higher Education Landscape:

As per AISHE report 2020-21:

- 1,113 Universities, 43,796 Colleges, 11,296 Stand Alone Institutions. 78.6% Colleges

privately managed.

- Enrolment around 4.13 crores, with 48.7% females. Majority (78.09%) enrolled in Under-Graduate, 11.5% in Post-Graduation.

RUSA's Impact:

- RUSA 1.0 & 2.0 **benefited around 2500 institutions**, focusing on 16 components. Approx. 1000 projects completed, rest ongoing.
- **Improved Gross Enrollment Ratio (GER), accreditation, student-teacher ratio.**

PM-USHA's Objectives:

- Address **gaps identified by NITI Aayog's Evaluation Report.**
- Enhance graduate **employability** through market-linked courses, internships, skillbased education. Introduce **technology and distance learning** for access and quality.
- Improve **NAAC accreditation** grades, emphasize **quality, e-learning**. Promote **community participation, gender sensitization.**

Alignment with National Education Policy (NEP):

NEP identifies key challenges:

- **Fragmented ecosystem**, limited cognitive skill development.
- Early specialization, limited access in **disadvantaged areas.**
- Teacher and institutional **autonomy limitations.**
- **Insufficient research emphasis** and **governance** issues.

Empowering PM-USHA with NEP Principles:

- PM-USHA guided by NEP's **pillars: accessibility, quality, equity, accountability, affordability.**
- Emphasizes skill-based education, employability, emerging courses, industry academia linkage, accreditation, choice-based credit system, academic reforms, technology integration.
- Prioritizes **"Focus Districts"** for targeted development.

PM-USHA Focus Areas:

Equity & Inclusion:

- Address disparities in enrollment.
- Promote diversity and multilingualism.

Quality Education:

- Innovate curricula and pedagogy.
- Transform institutions, enhance skills.

Accreditation & Quality:

- Boost trust through accreditation.
- Support institutions' improvement.

Digital Advancements:

- Embrace technology for learning.
- Enhance digital infrastructure.

Employability Enhancement:

- Forge industry ties for skills.
- Track employability outcomes.

Institutional Structure:**Central Level Structure**

- National Mission Authority (NMA)
- Chaired by Hon'ble Education Minister, GoI
- Project Approval Board (PAB)
- Chaired by Secretary (Higher Education), GoI
- National Project Directorate (NPD)
- Technical Support Group (TSG)

State Level Structure

- State Higher Education Council (SHEC)
- State Project Directorate (SPD)
- State Technical Support Group (State-TSG)

Institutional Level Structure

- Board of Governors (BOGs)
- Project Monitoring Unit (PMU)

Selection via Challenge Method**First Stage:**

- States/UTs sign **MoU** with MoE.

MoU encompasses State commitments:

- Implementation of NEP reforms
- Support for all government and government-aided institutions in pursuing accreditation
- Adoption of Guidelines on National Credit Framework (NCrF) and Choice Based Credit

System (CBCS) for Four Year Undergraduate Programme (FYUP).

Second Stage:

State Governments shortlist Universities, Colleges, and Districts.

Priority accorded to focus districts for receiving support under:

- **Component 2:** 'Grants to Strengthen Universities'
- **Component 3:** 'Grants to Strengthen Colleges'

Further, State Governments choose focus districts for:

- **Component 4:** 'New Model Degree College'
- **Component 5:** 'Gender Inclusion and Equity Initiative'

Third Stage:

- Ministry of Higher Education evaluates all submitted proposals, assisted by **Technical Support Group**.
- Proposals undergo examination, appraisal, and approval by the Project Approval Board (PAB).
- Selection criteria and past state performance form the basis for evaluation and approval.

Topic 52. US BOOSTS MILITARY PRESENCE IN RED SEA AMIDST IRAN TENSIONS

Important for the subject: International relations

More than 3,000 United States military personnel have arrived in the Red Sea aboard two warships, part of a beefed-up response from Washington after tanker seizures by Iran, the US Navy said.

Deployment and Intent

- Over 3,000 US military personnel arrived in the **Red Sea** on two warships as a response to Iran's recent tanker seizures.
- This reinforcement strengthens the US military presence in the **Gulf region**, essential for **global oil trade**.

Escalating Tensions and Implications

- **Iran's** attempts to control about 20 international ships in the region heighten tensions.
- Iran accuses the US of worsening regional instability with its military deployment.

Deployment Details

- US Navy's Fifth Fleet confirms the arrival of sailors and Marines after transiting through the **Suez Canal** on **USS Bataan** and **USS Carter Hall** warships.

- The deployment bolsters the maritime capability of the Fifth Fleet, based in **Bahrain**.

Warship Roles

- **USS Bataan**, an **amphibious** assault ship, carries fixed-wing and rotary aircraft along with landing craft.
- **USS Carter Hall**, a dock landing ship, transports Marines, and equipment, and supports landing operations.

Changing Dynamics

- Amidst US actions, **China's increased engagement** and mediation between Saudi Arabia and Iran impact the region. Iran's relations with other Arab Gulf states, such as the UAE and Kuwait, are showing signs of improvement.

Red Sea Region

Geographical and Geological Features:

- Separates northeastern Africa from southwestern Asia. Afro-Asian Rift Valley location; part of the **East African Rift System**. Approximately 2,250 km (1,400 miles) long and 200-355 km (125-220 miles) wide.
- The average depth of 490 meters (1,608 feet), a maximum depth of 3,040 meters (9,970 feet).
- The salinity of about **40 parts per thousand**, among the world's saltiest seas. Islands include the **Dahlak** Archipelago, the **Farasan** Islands, and **Zubair** Archipelago. Unique **volcanic and tectonic origins** shape the sea's landscape.

Countries, Ports, and Cities:

- Borders (proper) **Saudi Arabia, Egypt, Sudan, Eritrea, Djibouti, and Yemen**.
- **Key ports:** Jeddah (Saudi Arabia), Port Sudan (Sudan), Djibouti Port (Djibouti), Aqaba Port (Jordan).
- **Major cities:** Jeddah (Saudi Arabia), Port Sudan (Sudan), Aqaba (Jordan), Djibouti City (Djibouti).

Straits:

- **Bab el Mandeb Strait:** Located at the **southern** entrance of the Red Sea, connecting it to the **Gulf of Aden** and the **Indian Ocean**.
- **Strait of Tiran:** Situated at the **northern** end of the Red Sea, separating the Sinai Peninsula from the Saudi Arabian coastline and providing access to the **Gulf of Aqaba**.