ENSURE IAS

Current Affairs Total (CAT)

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CURRENT AFFAIRS

Polity & Governance
International Relations
Security
Economy
Science & Technology
Geography & Environment
Society & Culture
Ethics
Essay
Schemes

INDEX

F. Geography & Environment (54-71)

G. Society And Culture (72-87)

H. Ethics (88-94)

I. Essay (95-96)

J. Scheme (97-98)

UPSC PRELIMS 2024 (16 JUNE) (99-120)

A. POLITY & GOVERNANCE

1. Debate Over Model Code Of Conduct

Model Code of Conduct (MCC) is attracting national attention because of violations by senior politicians during election campaigning, in this context, there is a debate that should the MCC be given legal backing.

About Model Code of Conduct (MCC):

It is a **set of guidelines by the Election Commission of India (ECI)** that spells out how political parties and candidates must **conduct themselves** during the election campaign and polling.

1. It instructs how the Ministers of the parties in power must conduct themselves when the MCC is in force. It explains how parties can lodge complaints to the Election Commission observers in case of a dispute.

2. **Time duration:** The code comes into force **immediately when the election dates are declared** and remains till the **results are announced.** The MCC applies to all elections from the Lok Sabha and state Assemblies to local bodies.

3. **Features:** As soon as the code kicks in, the party in power, whether at the Centre or in the states should ensure that it does not use its official position for campaigning. Hence, **no policy, project or scheme can be announced** that can influence the voting behaviour. The party must also **avoid advertising at the cost of the public exchequer** or using official mass media for publicity on achievements to improve chances of victory in the elections.

Is the Model Code of Conduct legally binding?

1. The MCC evolved as part of the ECI's initiative to ensure free and fair elections and was the result of a consensus among major political parties. It has **no statutory backing**.
   - It means anybody breaching the MCC can't be proceeded against under any clause of the Code. Everything is voluntary. The EC uses **moral sanction or censure for its enforcement.**

2. The ECI can issue a **notice to a politician or a party for an alleged breach of the MCC** either on its own or based on a complaint by another party or individual.

3. Once a notice is issued, the person or party must reply in writing either accepting fault and tendering an unconditional apology or rebutting the allegation. In the latter case, if the person or party is found guilty subsequently, he/it can attract a written censure from the ECI.

Key Provisions of MCC:

The MCC contains **eight provisions** dealing with general conduct, meetings, processions, polling day, polling booths, observers, party in power, and election manifestos. Major provisions of the MCC are outlined below.

1. **Respectful Criticism**: Criticize parties based on their policies, past work, and records. Don't use caste, communal feelings, or unverified reports to attack them.

2. **Meeting Rules**: Inform the police about meeting venues and times so they can ensure security.

3. **Procession Rules**: Coordinate with other parties to avoid clashes if you're planning a procession along the same route. No burning or carrying effigies of other parties' members.

4. **Polling Day**: Authorized party workers at polling booths must wear identity badges without party names, symbols, or candidate names.

5. **Party in Power**: The ruling party must not:
   a. Mix official visits with election work
   b. Use official machinery for election purposes
   c. Advertise at public expense or use official media for self-promotion

6. **Election Manifestos**: Parties must not make promises that unfairly influence voters. They must also explain how they'll achieve their promises.

Subramaniam Balaji Vs Govt of Tamil Nadu, the Supreme Court ruled that giving out freebies can undermine free and fair elections. The court instructed the Election Commission to create guidelines on this matter, consulting with political parties. Additionally, the court stated that political parties cannot release manifestos during the 18 hours leading up to the end of voting. These manifestos must also explain how the party will finance any promises made.

Arguments in the context of legal backing for MCC:

Arguments for the legal backing	Arguments against the legal backing
Views of Goswami Committee: In May 1990, the Goswami Committee on Electoral Reforms suggested that the weakness of the MCC could be overcome by giving it statutory backing and making it enforceable through law. It suggested bringing certain areas within the ambit of electoral law and making their violation an electoral offence.	**Views of Justice Krisha Iyer:** In one of his judgments he observed that ECI is a reservoir of powers **under Article 324.** Thus, ECI has a lot of powers to act to ensure that elections are free and fair. So, it is not necessary to give legal teeth to the MCC.
The government went on to propose an amendment to the Representation of People's Act, 1951, to make the violation of some of the provisions of the MCC punishable. This Bill was, however, not passed.	Once the ECI goes to the courts, it will take a lot of time to prosecute. Electoral process however, once it starts, should be **completed expeditiously**. So, legal teeth should not be made a part of the Representation of the People Act (RPA), 1951.
MCC has not clearly spelt out the consequences of defaults, thus diluting its deterrent effect. Delayed responses dilute the impact of penalties and diminish public confidence in the credibility of the EC.	Most of the serious violations are also covered under Codes like IPC and CrPC.

EC can bring better enforcement of MCC through the powers it has under Clause 16(A) in the Election Symbols (Reservation and Allotment) Order, It gives the EC the power to **suspend or withdraw recognition of a political party** "for failing to observe the Model Code of Conduct or follow the lawful directions or instructions of the Commission".

Way Forward

Enforce the Model Code of Conduct (MCC) strictly, promptly, and fairly. Establish clear penalties for severe MCC breaches, such as hate speech, under the RPA 1951 and/or The Election Symbols Order. Utilize the C-vigil app to expedite prosecution of reported violations. Amend the RPA 1951 to allow the EC to revoke the 'star campaigner' status for serious misconduct. Encourage a voluntary code of ethics for social media to address propaganda and fake news.

2. Radical Democracy: A Renewed Focus in an Era of Shifting Politics

Various models of democracy are the centre of discussion because of the ongoing elections. In this context radical democracy and radical humanism becomes important as it is associated with the works of MN Roy. It becomes further important to discuss these ideas because we are living in an age of orthodoxy and regression.

About Radical Democracy:

1. Radical democracy is a political philosophy in Marxist tradition, it is a form of democracy that seeks to deepen democratic practices and institutions by emphasizing the role of active and direct participation by citizens in decision-making processes.

2. It challenges the traditional representative democracy model to advocate for more inclusive and participatory mechanisms.

Key Aspects Of Radical Democracy:

1. **Participatory Governance**: Radical democracy promotes extensive public involvement in political decision-making, beyond voting in elections. This can include participatory budgeting, citizens' assemblies, and deliberative forums where individuals can directly influence policy and governance.

2. **Decentralization of Power**: It advocates for the distribution of power away from central authorities to local communities, enabling more localized and context-specific decision-making.

3. **Pluralism and Inclusion**: It emphasizes the inclusion of diverse voices, specifically those historically marginalized or underrepresented, in the political process. It seeks to create spaces where different perspectives can be expressed and considered.

4. **Questioning Established Institutions**: It often involves a critical examination of existing political and economic institutions, challenging structures that perpetuate inequality, and proposing alternatives that promote social justice and equality.

5. **Grassroots Movements**: Many radical democratic practices are driven by grassroots movements that organize from the bottom up, advocating for change through collective action and community organizing.

6. **Against Elitist control**: It is sceptical of elite control over political processes and seeks to dismantle hierarchical structures that limit democratic participation.

7. **Emphasis on Social Justice**: Radical democracy is closely linked with social movements that focus on issues like economic inequality, racial and caste-based justice, tribal movements, gender equality, and environmental movements. Prominent theorists associated with radical democracy include Chantal Mouffe and Ernesto Laclau and MN Roy from India. who argue for a model of democracy that recognizes and embraces conflict and diversity as inherent and valuable aspects of democratic life. They believe that true democracy is about the continuous struggle to ensure that different voices and interests are represented and heard.

3. De-registering Power of the ECI

1. The Election Commission of India (ECI), in a recent report, emphasized the **importance of star campaigners** upholding the **Model Code of Conduct** (MCC) and refraining from actions that disrupt social harmony.

2. This has sparked a debate about the ECI's authority to address MCC violations and raised questions about the **need for de-registration of political parties.**

    a. **Derecognition:** The ECI can withdraw recognition from a political party for violating the Indian Constitution or the Representation of the People Act, 1951. This strips the party of privileges like reserved symbols and free airtime on state-owned media.

    b. **Deregistration:** This involves canceling a party's registration, preventing it from contesting elections. However, the **ECI currently lacks the power to deregister parties**.

Understanding Registered and Recognized Parties:

Characteristics	Registered Parties	Recognised Parties
Registration	Registered with ECI under Section 29A of RP Act, 1951	Recognised as 'national' or 'State' party under Election Symbols (Reservation and Allotment) Order, 1968
Conditions for Registration/ Recognition	Submit memorandum/ constitution, declare allegiance to Constitution, socialism, secularism, democracy, and sovereignty of India	Win requisite number of seats and/or obtain required percentage of votes in general election to Lok Sabha or State Assembly

	Tax exemption for donations, common symbol for contesting elections, 20'star campaigners' during election campaign	Reserved symbol during elections, 40'star campaigners', additional concessions
Benefits		
Number of Parties	2,790 active registered parties in India	6 'national' parties, 61 'State' parties
Status	Registered but not necessarily recognised	Recognised as 'national' or 'State' party, with additional benefits

Why Deregistration Matters:

1. **Inactive Parties**: Many registered parties don't participate in elections, raising concerns about potential misuse of tax exemptions and donations.
2. **MCC Violations**: Recognized parties often breach the MCC, but the ECI's current options are limited. Deregistration could serve as a stronger deterrent.
3. **Electoral Integrity**: Deregistering inactive or non-compliant parties could improve transparency, fairness, and accountability in the electoral process.

Proposed Solutions:

1. **ECI's Proposal**: The ECI has suggested amending the law to grant it the power to deregister parties.
2. **Law Commission's Recommendation**: The Law Commission has recommended allowing the deregistration of parties that haven't contested elections for 10 consecutive years.
3. **National Electoral Fund**: This proposal suggests distributing funds to parties based on election results, potentially discouraging inactive parties.
4. **ECI's Audit Powers:** Granting the ECI the power to audit parties' accounts could improve transparency and accountability.

Conclusion

The debate on the ECI's power to deregister political parties highlights the need for continuous electoral reforms. While the ECI's current options are limited, various proposals offer potential solutions to address issues like inactive parties, MCC violations, and transparency.

4. Article 329(b): ECI's Tool to Safeguard Electoral Process

1. Recently, the Election Commission of India invoked **Article 329(b)** of the Constitution before the Supreme Court to limit judicial intervention in the electoral process.
2. As per 329(b), **no election** to either House of Parliament or to the either House of the Legislatures of a State **shall be called in question** except by an election petition presented to such authority and in such manner as may be provided for by or under any law made by the appropriate legislature.
   - The **articles 324 to 329** of the Indian Constitution, which are enshrined in Part XV, specifically **deal with the provisions related to elections.**
3. Supreme Court in **N. P. Ponnuswami vs Returning Officer**, **Namakkal Constituency & Ors. (1952)** states that once the Election Commission of India officially notifies the election process, the court cannot intervene or interfere.
4. **Also, under Representation of the People Act (1951),** Section 80 states that, the validity of any election cannot be challenged or questioned except by filing an election petition.
   a. Election petitions are filed in the concerned state's High Court, which has original jurisdiction over them.
   b. Appeals lie with the Supreme Court of India.
   c. An election petition can be filed by any candidate, or an elector relating to the election personally.
      o **Elector means** a person who was entitled to vote at the election to which the election petition relates.

5. Need For A Revamped Judicial Infrastructure

Although issues like vacancies in courtrooms, pendency in cases and representation from women are generally spoken of, the issues like the significance of judicial infrastructure and connected budgetary allocations like courtrooms to digital databases which contributes to the effectiveness of the judiciary are ignored. These issues should also be emphasized well.

The Need For Better Judicial Infrastructure:

1. **Enhance Productivity**: Empirical evidence supports the correlation between a functional judicial system and enhanced productivity in the administration of justice. Studies have indicated that efficient judicial processes lead to quicker resolution of cases, thereby improving overall productivity.

2. **Streamlined Performance:** There is substantial empirical backing for the relationship between a well-functioning legal system and efficiency in administering justice. A smoothly operating legal system tends to expedite legal proceedings, contributing to the efficient performance of the justice system.

3. **Reduction of Delay and Backlogs:** Adequate judicial infrastructure is crucial for reducing delays and backlogs in legal proceedings. In this context, physical infrastructure (e.g., courtrooms), personnel infrastructure (e.g., judges), and digital infrastructure play interconnected roles in addressing case pendency.

4. **Essential During Difficult Times:** The COVID-19 pandemic underscored the significance of sufficient judicial infrastructure, particularly digital infrastructure. Courts that were able to transition to virtual modes of operation demonstrated the importance of having robust digital tools in place to ensure uninterrupted legal proceedings during crises.

Addressing Infrastructure Challenges

Issue	Potential Solution
1. **Quality of Judicial Infrastructure**	• Increase funding to improve existing buildings, implement strict quality standards for new construction projects.
2. **Shortage of Courtrooms**	• Construct new courtrooms, optimize scheduling of existing courtrooms, explore alternative dispute resolution methods.
3. **Outdated Digital Infrastructure**	• Invest in modern technology for courtrooms, provide training to judicial staff on using digital tools effectively.
4. **Lack of Health and Sanitation Facilities**	• Ensure all court complexes have clean, functioning restrooms with sanitary napkin vending machines.
5. **Non-Inclusive Infrastructure for PwDs and Women**	• Implement Universal Design Principles in all court buildings, provide childcare facilities, ensure sufficient female restrooms.
6. **Lack of Data and Reporting**	• Conduct regular surveys and analysis to assess infrastructure needs, mandate reporting from High Courts on infrastructure status and budget spending.

6. Supreme Court Strengthens Juvenile Justice Act, 2015

1. The Supreme Court recently passed a judgment in the **"Child in Conflict with Law (CCL) through his mother v. State of Karnataka"** case to strengthen the Juvenile Justice (Care and Protection of Children) Act, 2015.

2. The judgment focused on provisions related to the preliminary assessment of CCL in heinous offenses.

About the Juvenile Justice Act, 2015

1. **Scope:**
   a. Consolidates and amends laws concerning Child in Conflict with Law (CCL) and Child in need of Care and Protection (CCP).
   b. **CCL** means Child below 18 years of age alleged/ found to have committed an offense.

2. **Juvenile Justice Boards (JJBs):**
   a. Mandates setting up JJBs in every district to handle CCL cases.

3. **Preliminary Assessment:**
   a. For **heinous offenses allegedly committed by a child over 16 years** of age, JJBs must conduct a preliminary assessment to assess the child's capacity.
   b. Children's Court decides whether the child should be tried as an adult after the assessment.

Key Highlights of the Judgment

1. **Appeals against JJB's Preliminary Assessment:**
   a. To be filed before the Children's Court (not Sessions Court).
   b. 30-day time limit for filing such appeals.

2. **Time Limit for Preliminary Assessment:**
   a. 3-month time period is directory (not mandatory).

Impact:

This judgment clarifies the appeal process and time limits for preliminary assessment under the JJ Act. It aims to streamline the legal procedures for CCL and ensure fair treatment of children in conflict with the law.

7. Is Private Property a 'Community Resource'? SC to Decide

1. Supreme Court (SC) will decide if private properties can be considered **'material resources of the community'** under Article 39 (b) of the constitution.
   - **Article 39(b) in the Directive Principles of State Policy (DPSP)** says that "the state shall, in particular, direct its policy towards securing-

that the ownership and control of the material resources of the community are so distributed as best to subserve the common good".

2. The court will also ponder upon the **legal sanctity of Article 31C** of the Constitution in the wake of the Minerva Mills judgment.
   a. **Article 31C** protects a law made under **Articles 39(b) and (c)** empowering the State to take over material resources of the community, including private properties, for distribution to subserve the common good.
      - **Article 39(c)** states that "the operation of the economic system does not result in the concentration of wealth and means of production to the common detriment".
   b. In the Minerva Mills case of 1980, SC had declared two provisions of the 42nd Amendment which restricted the Judicial Review, as unconstitutional.
      - any constitutional amendment from being 'called in question in **any court on any ground'** and
      - accorded precedence to the **DPSP** over the fundamental rights of individuals

8. Doctors and the Consumer Protection Act, 1986

1. Recently, Supreme Court ruled that advocates cannot be held liable under the Consumer Protection Act, 1986, (CPA) for deficiency in service.

2. In its 1995 decision, SC had held that medical professionals are accountable under the CPA. Now, The court has suggested re-examining the definition of "services" under the CPA, which currently includes the medical sector.

Consumer Protection Act, 2019

1. Consumer Protection Act, 2019 replaced the Consumer Protection Act of 1986. Its objective is to empower consumers and help them in protecting their rights

through its various rules and provisions. The new act will be swift and **less time consuming compared to the older Consumer Protection Act, 1986**.

- **Who is a consumer?** A person who **buys any goods or services** for a consideration which has been paid or promised or partly paid and partly promised, or under any system of deferred payment is termed as consumer protection Act.

Key features of Consumer Protection Act, 2019

While retaining certain old provisions, the New Act has certain new provisions that tighten the existing rules to further safeguard consumer rights and create exhaustive consumer protection law. New provisions under Consumer Protection Act 2019 are:

1. Inclusion of E- commerce, Direct selling Establishment of Central Consumer Protection Authority (CCPA)
2. Strict Norms for Misleading Advertisement
3. Strict Norms for product liability
4. Changes in the Pecuniary Jurisdiction
5. Greater ease to dispute resolution Addition in the clause of **"Unfair Trade Practice"**:
6. Unfair Contract
7. Alternate Dispute Resolution through mediation

Consumers Rights:

Consumer rights are guaranteed under Consumer Protection Act, 2019. A Consumer is having the following six consumer rights under the Act:

1. Right to safety
2. Right to be informed
3. Right to choose
4. Right to be heard
5. Right to seek redressal
6. Right to consumer education

Creation of Consumer Protection Council:

1. The Act has mandated the central government to establish Consumer Protection Councils called as Central Councils.

2. It also mandates the state government to establish Consumer Protection Councils in states and districts as State Councils and District Councils respectively.

3. These are advisory bodies which will advise on the promotion and protection of consumer rights. It will be headed by the respective ministers of consumer affairs at the central and state levels. It will be headed by the District Collector at district levels.

Central Consumer Protection Authority:

1. The Act establishes the Central Consumer Protection Authority [CCPA] to protect and enforce the rights of consumers. It will regulate matters related to:
   a. violation of consumer rights
   b. unfair trade practices
   c. misleading advertisements.
2. It can also file cases before the Consumer Disputes Redressal Commission.
3. It will have a separate investigation wing to investigate cases under the Act.
4. It will also have the power to issue directions and penalties against false or misleading advertisements.
5. The Authority can issue safety notices to alert consumers against dangerous or hazardous goods or services.

Consumer Dispute Redressal Commission:

1. The Act sets up a three-tier consumer disputes redressal commissions/consumer courts at district, state and national levels. Complaints to consumer courts can be filed electronically and from the place where the complainant resides.
2. A consumer can file a complaint with CDRCs in relation to:
   a. unfair trade practices.
   b. defective goods or services.
   c. overcharging or deceptive charging.
   d. Selling of goods or services which may be hazardous to life and safety.

3. Complaints against unfair contracts can be made only at the center and state consumer disputes redressal commissions.

4. The final appeal against the order of the national commission shall be made in the Supreme Court.

Mediation

- The Act provides for an Alternate Dispute Resolution Mechanism through mediation.

- A grievance can be referred for mediation by the Consumer Forum if it is satisfied that the scope for early settlement by mediation exists.

Product Liability:

- A manufacturer/service provider/product seller will be held responsible to provide compensation for any damage caused by a defective product or deficient services.

- Compensation may be obtained if the complaint for product liability satisfies any of the following conditions:
    o   Manufacturing defect
    o   Design defect.
    o   Deviation from manufacturing specifications
    o   Not conforming to express warranty
    o   Lack of adequate instruction for correct use
    o   Faulty services.

Penalties:

- Penalty can be imposed by the CCPA on a manufacturer or an endorser of up to Rs 10 lakh and imprisonment for up to two years for a false or misleading advertisement.

- In case of a subsequent offence, the fine may extend to Rs 50 lakh and imprisonment of up to five years.

Conclusion:

The recent Supreme Court ruling and the provisions of the Consumer Protection Act, 2019, highlight the ongoing debate on the scope of consumer protection laws and their applicability to various professions, including doctors and lawyers. The focus is on striking a balance between consumer rights and the professional responsibilities of service providers.

9. UGC Regulation 2018

There's been a recent dispute regarding the **appointment of vice-chancellors** in state universities. The issue stems from conflicting guidelines between the University Grants Commission (UGC) regulations of 2018 and existing state legislation.

UGC Regulations

Established under the UGC Act of 1956, UGC Regulation 2018 sets **minimum qualifications for academic staff** in universities and colleges across India.

Scope of the Regulation:

1. **All universities** established by central, provincial, or state acts.

2. **All colleges and institutions** affiliated with or recognised by the UGC in consultation with the respective university.

3. All institutions **deemed to be universities** by the UGC.

Selection of Vice-Chancellor

1. A **Search-cum-Selection Committee** identifies a shortlist of 3-5 candidates.

2. One committee member is **nominated by the UGC Chairman** for selecting vice-chancellors of state, private, and deemed universities.

3. A vice-chancellor must be:
    a. Distinguished academician
    b. Minimum of **ten years of experience** as a Professor in a university system or an equivalent position in a reputable research organization or an equivalent position in a reputable academic administrative organization

Controversy Over Appointment of Vice-Chancellor

Supreme Court's judgement in **Gambhirdan K. Gadhvi v. State of Gujarat & Ors** (2022) regarding Vice-Chancellor appointments:

1. The **Court recognizes UGC Regulations**, established under the UGC Act (1956), as part of the Act itself.

2. Since "education" falls under the **Concurrent List** of the Constitution, both central and state governments have the power to make laws regarding it.

3. When a **conflict arises** between a state law and central legislation (UGC Regulations), the principle of repugnancy (Article 254) dictates that the **central law prevails**.

4. However, a state law contradicting UGC Regulations can be an exception within that state if it receives the President's approval after reservation.

5. Appointing a Vice-Chancellor in a way that **disregards UGC Regulations** can be considered a **statutory violation**.

This clarifies that UGC Regulations play a significant role in Vice-Chancellor appointments, with exceptions existing only under specific circumstances.

10. Diplomatic Passport

One of the incumbent Members of Parliament fled to Germany on a diplomatic passport after allegations of sexual abuse.

Diplomatic passports

1. **Appearance:** Maroon-Colored

2. **Eligibility**: Issued to designated members authorised by the Government of India. These persons could be
   a. Those living or having been granted a diplomatic status; or
   b. Government officials proceeding abroad on diplomatic assignments or for official purposes.

3. **Validity period**: 5 years or less.

4. **Issuance**: External Affairs Minister has the discretion to issue a Diplomatic Passport to a person if the person, in the opinion of the minister, should have such a Passport either

because of the nature of his or her foreign mission or because of the position he or she holds or has held in the past.

5. **Advantage:**
   a. **Immunity:** Holders of such passports are entitled to certain privileges and immunities as per international law, including immunity from arrest, detention, and certain legal proceedings in the host country.
   b. **Exemption from Visa requirement in some countries:** Typically, MEA also issues visa notes to Indian Government officials going abroad for an official assignment or visit.
   - However, India has Visa Waiver Agreements for the holders of diplomatic passports with Germany along with 33 other countries.
   - This agreement allows Indian diplomatic passport holders to visit these countries without a visa for up to 90 days.

About Indian passport

1. Passports and Visas are mentioned under the **Union list of the 7th Schedule of the Constitution**.

2. Issuance of passports in India is **governed by the Passports Act, of 1967** according to which:
   a. All persons who depart or intend to depart from India are required to have a valid passport or travel document.
   - However, the **Central government may exempt some people** from the need for possession of a passport.
   b. Additionally, the Central Government may issue a passport to a person who is not a citizen of India if that Government believes that it is necessary so to do in the public interest.

3. There are **3 classes of passports** issued in India**: i)** Ordinary (blue colour), **ii)** Diplomatic (white colour) and **iii)** Official (maroon colour)

11. World Press Freedom Index 2024

Recently, global media watchdog **Reporters Without Borders** (RSF) published World Press freedom Index 2024.

About Index

1. The index **ranks 180 countries** based on the ability of journalists to work freely and independently.

2. It comprises **5 categories:**

    a. Political context,

    b. Legal framework,

    c. Economic context,

    d. Sociocultural context, and

    e. Security

3. The index **focuses on only press freedom and does not** assess the quality of journalism or general human rights violations.

Key findings of the 2024 Index

1. There has been an **overall decline in press freedom globally**, with an average drop of 7.6 points across countries.

2. Countries with "**good**" **press freedom are primarily located in Europe**, particularly within the European Union, which has **adopted the European Media Freedom Act (EMFA).**

    a. The European Media Freedom Act (EMFA) is a new EU law designed to protect media pluralism and independence.

    b. It aims to safeguard journalists from political pressure, facilitate cross-border media operations, and ensure citizens' access to diverse and reliable information. Additionally, it outlines the role of member states in fostering a favourable environment for press freedom.

3. The **Maghreb and Middle East regions experienced the most severe restrictions** on press freedom imposed by government forces.

4. **No Asian country** made it to the Index's top 15 in 2024, indicating a pervasive challenge to press freedom in the region.

5. **In the Asia-Pacific region**, which ranks as the **world's second most challenging area for journalism,** several countries, including Myanmar, China, North Korea, Vietnam, and Afghanistan, are among the most dangerous for media personnel.

Top 3 Countries		
Rank	**Countries**	**Score**
1	Norway	91.89
2	Denmark	89.6
3	Sweden	88.32
Bottom 3 Countries		
180	Eritrea	16.64
179	Syria	17.41
178	Afghanistan	19.09

India's Ranking and Performance:

1. **India's rank improved** slightly from 161 in 2023 to 159 in 2024, primarily due to the decline in press freedom in other countries.

2. **India's scores declined** in all categories except for the security indicator**.**

3. **India ranks behind** Turkey (158), Pakistan (152), and Sri Lanka (150) in terms of press freedom.

B. International Relations

1. India-Indonesia Relations: 75 Years of Diplomatic Ties

2024 marked the 75th anniversary of diplomatic relations between India and Indonesia.

More about the news

1. **Track 1.5 Diplomacy**: Enhanced engagement through initiatives like the Jakarta Futures Forum (JFF) and the **first-ever India-Indonesia defense industry** exhibition-cum-seminar.

2. **E-Sports Show Match**: Organized by the Indonesian embassy at the India Gaming Show 2024.

India and Indonesia
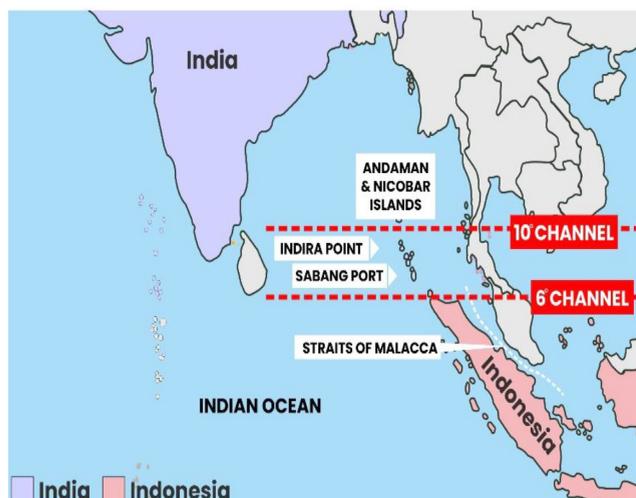
Significance of Bilateral Relations:

1. **Maritime Security**: Joint naval exercises like **Samudra Shakti (Navy)** and coordinated patrols (IND-INDO CORPAT) to ensure stability in the Indian Ocean region.

2. **Indo-Pacific Vision**: Shared vision for a free, open, and inclusive Indo-Pacific region, respecting ASEAN centrality.

   - India's Act East Policy and Indo-Pacific Oceans Initiative (IPOI) and Indonesia's Global Maritime Fulcrum vision synergize, enhancing geopolitical engagement.

3. **Strategic Partnership:** Both countries established Strategic Partnership in 2005, later elevated to a New Comprehensive Strategic Partnership in 2018 ,allowing for new collaboration in field of defence industry, science and technology etc.

4. **Economic Dialogue:** Launched in 2023 to facilitate mutual learning and policy coordination.

5. **Military Engagements**: Increased military-to-military cooperation, such as INS Sindhukesari's visit to Jakarta.

6. **Shared Cultural Values**: Shared history, traditions, and cultural centers.

   a. Both countries participated in the Bandung Conference in 1955, which led to the establishment of the Non-Aligned Movement (1961).

   b. Stories from great epics of Ramayana and Mahabharata form source of Indonesian folk art and dramas.

   c. Bali Yatra is celebrated with a great deal of fervour in both India and Indonesia.

Benefits For India

1. **Enhancing India's Defence exports:** Indonesia has expressed interest in the BrahMos missile and Light Combat Aircraft among others.

2. **Important trade partner**: Indonesia is India's largest trade partner in ASEAN region.

   - Total Bilateral Trade between both countries stands at around USD 38.85 Billion (during fiscal year 2022-23)

3. **Indian rupee Internationalization of:** MoU to promote the use of local currencies for cross- border transactions were signed by Reserve Bank of India (RBI) and the Bank Indonesia (BI) in 2024.

4. **Enhancing maritime Connectivity**: Development of Sabang port under the SAGAR initiative.

Benefits For Indonesia

1. **Important export destination**: India is the 2nd largest buyer of coal and crude palm oil from Indonesia.

2. **Humanitarian Assistance**: India launched Operation Samudra Maitri to provide humanitarian assistance to Indonesia, post-earthquake and tsunami in 2018.

3. **Development Partnership**: Indonesia is a major recipient of capacity-building platforms like ITEC (Indian Technical and Economic Cooperation Programme), and Technical Cooperation Scheme (TCS) of the Colombo Plan.

Challenges and Solutions in the India-Indonesia Relationship

Challenges	Solutions
1. Trade Imbalance - India imports more palm oil and coal from Indonesia.	• Diversify India's exports to Indonesia. • Promote Indian products and services in the Indonesian market. • Explore new areas of trade cooperation, such as renewable energy and pharmaceuticals.
2. Unrealized Trade Potential **-** Bilateral trade is below its estimated potential.	• Expedite the negotiation and implementation of a Comprehensive Economic Partnership Agreement (CEPA). • Address trade and investment barriers through CEPA. • Identify and explore new areas of trade and investment cooperation.
3. Dominance of China -Indonesia's growing ties with China raise concerns.	• Strengthen India's economic and strategic engagement with Indonesia. • Explore joint infrastructure projects under India's Act East policy. • Enhance defense and security cooperation between the two countries.
4. Lack of Connectivity **-** Limited flights and visa issues hinder people-to-people ties.	• Promote tourism through initiatives like the 'RICH' (Religious, Cultural & History) theme-based tourism plan. • Streamline visa processes and promote cultural exchange programs.

2. BIMSTEC Charter Comes into Force

1. The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) charter was signed and adopted during the 5th summit of the grouping in Sri Lanka, in 2022.

2. With the endorsement of the charter by Nepal, all member states completed the ratification of the foundational document and the charter came into force on **May 20, 2024.**

About BIMSTEC Charter

1. BIMSTEC Charter is a foundational document that outlines the goals, principles, and structure of the BIMSTEC.

2. Charter confers legal personality on the grouping and paves the way for external partnerships and admission of observers and new members.

Significance for India

1. Give boost to India's Act East and Neighbourhood First policy.

2. It acts as a bridge between South Asia and SouthEast Asia.

3. BIMSTEC would provide an alternative platform especially after dysfunction of SAARC since 2016.

Challenges and Potential Solution

Challenge	Potential Solutions
1. Slow Organizational Progress	1. Define timelines and goals for development. 2. Update BIMSTEC charter regularly. 3. Simplify decision-making processes.
2. Absence of a Free Trade Agreement	1. Prioritize negotiations and implementation of a comprehensive BIMSTEC Free Trade Agreement (FTA). 2. Eliminate non-tariff barriers among members. 3. Develop regional value chains to boost trade within BIMSTEC.
3. Strained Relations Between Members	1. Encourage open dialogue and diplomacy to resolve bilateral disputes peacefully. 2. Promote people-to-people contact through cultural exchanges, educational programs, and tourism. 3. Strengthen regional mechanisms for conflict prevention and resolution.
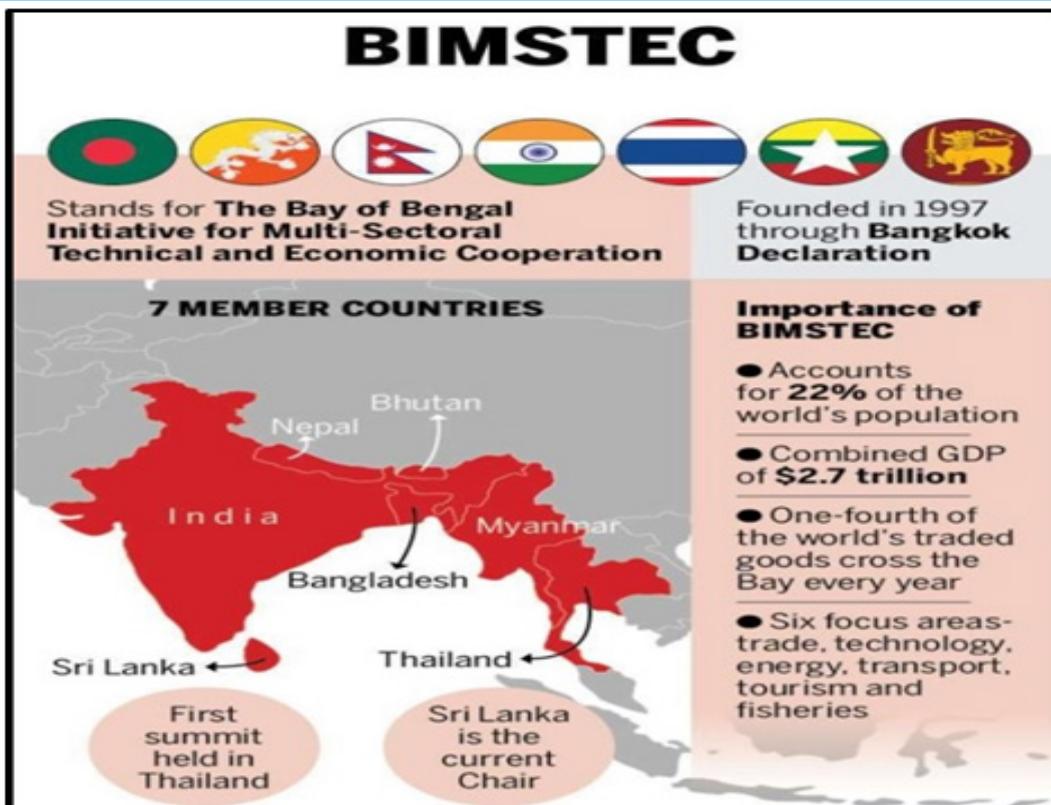
3. 2nd INDIA-US Strategic Dialogue On Africa

1. In May, 2024 **2nd INDIA-US Strategic Dialogue on Africa was held in Washington DC.** Dialogue aims to **share ideas** and **explore** ways to develop institutional, technical and bilateral **synergies to work** together in Africa.

2. This is the **1st such dialogue after the inclusion of the African Union (AU) as a permanent member of the G20** during India's presidency of the G20.

Significance of Africa for India

1. **Strategic:** Africa is vital for India's maritime security, protect trade in the Indian Ocean Region (IOR) from piracy, etc.

2. **Economic:** Africa's vast natural resources, including oil, gas, minerals, etc., and growing market **provide both demand-side and supply-side** opportunities for the Indian businesses.

3. **Energy Security:** Collaboration in the renewable energy sector, such as under International Solar Alliance, aligns with shared goals of sustainable development.

4. **Multilateral:** Cooperation with African countries in multilateral forums like UN, Commonwealth, and Non-Aligned Movement (NAM) enhances India's global influence and prospects of South-South cooperation.

Challenges in India-Africa Relations

Challenges	Solution
1. **China factor**: China's growing influence in Africa through its Belt and Road Initiative (BRI) and investments poses a challenge to India's interests.	• **Enhance India's own development initiatives** like the Asia-Africa Growth Corridor **(AAGC),** focus on sustainable and transparent projects, and offer alternative financing options to African nations. Leverage historical ties and cultural connections to strengthen people-to-people relations.

2.	**Security:** Persistent conflicts and political instability in parts of Africa pose risks to Indian investments, expatriates, and development projects.	• **Increase cooperation in defense and security**, provide training and capacity building to African security forces, and participate in peacekeeping missions. Encourage Indian businesses to adopt risk mitigation strategies and ensure the safety of Indian expatriates.
3.	**Racial tensions:** African students complain of harassment and discrimination.	• **Promote cultural understanding** and address discrimination through education and dialogue.

4. India Needs A Long-Term Integrated Energy Policy

India's energy security challenges may escalate in future, particularly, due to the recent geopolitical tensions in the Middle East, which may cause volatility in crude oil prices and pose a risk of supply-chain disruption.

India's Crude oil dependence

1. India is the **world's 3rd-largest importer** of crude oil**,** and the **3rd-largest consumer** of oil overall, behind the US and China.
   - According to the Petroleum Planning and Analysis Cell (PPAC) of the Ministry of Petroleum & Natural Gas**, India imported 232.5 million tonnes** of crude oil in the financial year 2023-24.
2. India's **crude oil import dependence increased to 87.7% in 2023–2024**, up from 87.4% in the previous year.
   - This is due to a combination of **high demand and stagnant domestic production.**
3. **Russia** is India's top oil supplier, accounting for more than 30% of India's imports in 2023.
   - Before the Ukraine conflict, **Iraq** was India's top supplier of crude oil, **followed by Saudi Arabia and the United Arab Emirates**.

- However, after the invasion, Russia climbed to the top, driven by **substantial discounts on oil prices.**
4. Nevertheless, over 40% of India's oil at present is sourced from the Middle East region, and the **recent geopolitical tensions** in the region may pose supply disruptions.

India's present options

1. **Increasing supply from Russia**: India is exploring options to **increase purchase from Russia** through the **Chennai-Vladivostok route** (which passes through the Sea of Japan, the South China Sea and Malacca Strait), in case the traditional route through the Red Sea cannot be used.
2. **Importing Liquefied Natural Gas (LNG):** India, the **world's fourth-largest LNG importer,** seeks to diversify its LNG import options to ensure stable and secure gas supplies.
3. India imported a total 19.85 million tonnes of LNG in FY 2022-2023, of which 10.74 million tonnes, or 54%, came from **Qatar.**
4. **Building transnational pipelines:** Transnational pipelines could have been an alternative for India, but certain political reasons have hindered their success.
   a. **Myanmar-Bangladesh-India gas pipeline** did not fructify because the Bangladesh side, due to domestic political compulsions, wanted certain bilateral matters to be included in the **tripartite gas agreement** which were not acceptable to the Indian side.
   b. **Iran-Pakistan-India gas pipeline project**, despite agreement on several technical and commercial issues, did not progress due to political instability in Pakistan.
   c. **Turkmenistan-Afghanistan-Pakistan- India (TAPI)** gas pipeline project had problems due to civil conflict in Afghanistan.

Unfinalized National Energy Policy

The Indian government drafted a **National Energy Policy** (NEP) in 2017, which aimed to achieve goals like universal energy access, energy security, environmental sustainability, and economic growth through a diversified energy mix. However, India still has not finalised the draft NEP.

What are the Challenges and Possible Solution

	Challenges		Solution
1.	Over-reliance on crude oil imports	•	Diversify energy sources, increase domestic production, and explore alternative fuels like natural gas and hydrogen.
2.	Geopolitical risks and supply disruptions.	•	Develop strategic partnerships with stable suppliers, invest in energy storage and infrastructure, and strengthen diplomatic relations in key regions.
3.	Growing energy demand	•	Promote energy efficiency and conservation measures, invest in renewable energy sources, and explore nuclear power as a viable option.
4.	Environmental concerns	•	Accelerate the transition to renewable energy sources, invest in research and development (R&D) of clean energy technologies, and implement policies to reduce carbon emissions.
5.	Limited domestic production	•	Incentivize exploration and production of domestic oil and gas reserves, invest in (R&D) of new extraction technologies, and promote energy efficiency to reduce reliance on imports.
6.	Lack of adequate infrastructure	•	Invest in upgrading and expanding the energy infrastructure, including power grids, pipelines, and storage facilities. Develop smart grid technologies to integrate renewable energy sources effectively.
7.	High energy costs	•	Implement policies to reduce energy tariffs and subsidies, promote competition in the energy sector, and invest in energy-efficient technologies to lower overall costs.

Conclusion

India needs a long-term and integrated energy policy that projects the country's energy requirements over the next 25 years, while taking into account domestic production, import requirements of fossil fuels, and our commitments to transition towards clean energy.

5. India's Support for Palestine's UN Membership

1. India voted in favour of Palestine for its full membership to the United Nations.
2. Palestine currently holds observer status at the UN, allowing it to participate in debates but not vote.

About United Nations

1. It is an **international organization** founded in 1945.
2. It is **guided by** the purposes and principles contained in its founding UN Charter.
3. **Members:** 193 States
4. All UN Member States are **members of the General Assembly**.
5. States are admitted to membership by a decision of the General Assembly upon the recommendation of the Security Council.
6. The Secretary-General is Chief Administrative Officer of the UN
7. The Secretary-General is appointed by the General Assembly on the recommendation of the Security Council for a 5-year, renewable term.

About UN Membership

1. **Eligibility:** Open to peace-loving states that accept the obligations of the UN Charter.
2. **Admission Process:**
   a. Applicant state submits an application to the Secretary-General.
   b. Security Council considers the application and makes a recommendation.
   c. General Assembly votes on the application, requiring a two-thirds majority.
3. **Recent Addition**: South Sudan (2011)

Note: Expulsion from the United Nations is a procedure under **Article 6**, Chapter II of the United Nations Charter when a member state of the United Nations can be expelled from the organization. This can be done when a member state has persistently violated the principles of the United Nations Charter. To date, only one member state has been expelled, the Republic of China (Taiwan) under General Assembly Resolution 2758, and replaced by the People's Republic of China (PRC) in 1971.

C. SECURITY

1 Supersonic Missile-Assisted Release of Torpedo (SMART) System

The system, which can be **launched from both coasts and warships, was successfully flight-tested** from a ground **mobile launcher from the Dr APJ Abdul Kalam Island off the Odisha coast.**

About the SMART System:

Supersonic Missile Assisted Release of Torpedo (SMART) CONOPS
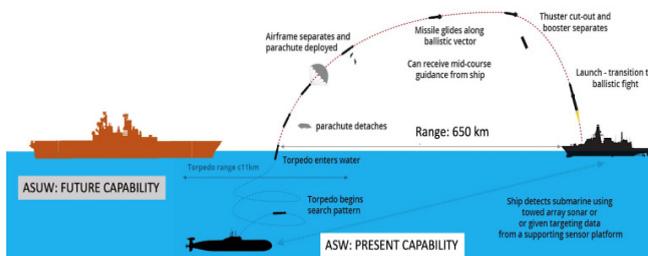
1. Designed and developed by the **Defence Research and Development Organisation.**
2. Launched from a **ground mobile launcher from Dr APJ Abdul Kalam Island off the Odisha coast.**
3. **Features:**
   a. Missile-based mechanism to launch **lightweight torpedoes**, **targeting submarines hundreds of kilometres away.**
   b. Particularly **employed in the absence of other assets for immediate action when an enemy submarine is detected.**
   c. **Canister-based missile system** consisting several **advanced subsystems**, including **2-stage solid propulsion and precision inertial navigation.**
   d. **Carries an advanced lightweight torpedo missile as a payload with a parachute-based release mechanism.**

Q. With reference to the Supersonic Missile-Assisted Release of Torpedo (SMART) system, consider the following statements:

1. It is a canister-based system that can deliver torpedoes far beyond their conventional range.

2. It has a two-stage liquid propulsion system.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: (a)

2. Igla-S Air Defense Systems

The Army is all set to begin receiving another set of Russian Igla-S very short-range air defense systems (VSHORAD).

About Igla-S

1. **Man-Portable Air Defense System (MANPADS):** Igla-S is a MANPADS designed and developed by Russia.
2. **Capabilities:**
   a. **Hand-held Defense System:** Igla-S is a portable air defense system that can be operated by an individual or a crew.
   b. **Targets:** It is designed to effectively bring down low-flying aircraft and can also neutralize air targets like cruise missiles and drones.
3. **Comprehensive Air Defense Solution:** The Igla-S system comprises various components that work together to provide a comprehensive air defense solution.
   • These components include the 9M342 missile, the 9P522 launching mechanism, the 9V866-2 mobile test station, and the 9F719-2 test set.
4. **Last Line of Defense:** Igla-S serves as the soldier's final line of defense against enemy aircraft, helicopters, and UAVs in a multi-layered air defense network.
5. **Range and Performance:** Igla-S has an **impressive range of 500 meters to 6 kilometers** and can engage targets at altitudes up to 3.5 kilometers. The **missile travels at a speed of 400 meters per second** and has a rapid deployment time of 13 seconds.

6. **Significance for India:** The acquisition of the Igla-S MANPADS is a significant step for India as it enhances the country's air defense capabilities.

   a. The system proves especially valuable in mountainous regions, where its portability and effectiveness against low-flying targets make it a formidable asset.

What is a Very Short-Range Air Defense (VSHORAD) Missile System?

1. VSHORAD missile systems, including the Igla-S, are designed specifically to counter low-altitude aerial threats over short distances.

2. These systems are l**ightweight, portable, and can be operated by individuals or small groups.**

3. VSHORAD missiles are **surface-to-air missiles** that provide crucial defense against low-flying aircraft, helicopters, and drones.

3. Inter-Services Organisation (Command, Control & Discipline) Act, 2023

Recently, in view of the **multi-dimensional security threats facing India**, the **Ministry of Defence has enacted the Inter-Services Organisation (Command, Control and Discipline) Act, 2023.**

1. This act aims to **enhance jointness and integration** among the armed forces**.**

2. Efforts like the Andaman & Nicobar Command, Strategic Forces Command, and plans for 5 theatre commands highlight this objective.

3. The Inter-Services Organisation Bill **enables** joint-services commands to function efficiently, ensure speedy resolution of matters, prevent duplication of operations and promote greater integration and jointness among armed forces personnel.

Current Challenges to Theatre Commands and Jointness:

1. Absence of a legal framework for creating Inter-Services Organizations.

2. Unclear disciplinary mechanism for CAPF personnel working with inter-service organizations.

3. Limited disciplinary and administrative powers of Inter-Services Organizations' commanders over personnel from different services.

4. Delays in the administration of justice due to the need to send officers back to their parent service units for disciplinary or administrative action.

How the Act Promotes Theatreization and Jointness:

1. Creates a solid foundation for joint structures and improves the functioning of the Armed Forces.

2. Empowers the central government to establish Inter-Services Organizations.

3. Extends applicability to personnel beyond the armed forces, including CAPFs.

4. Enables effective discipline maintenance in inter-services establishments by their heads.

5. Empowers the Commander-in-Chief or Officer-in-Command of ISO with disciplinary and administrative powers.

6. Eliminates the need to send personnel under disciplinary proceedings to their parent service units.

7. Ensures speedy disposal of cases of misconduct or indiscipline.

8. Saves public money and time by avoiding multiple proceedings.

Salient Features of Inter-Services Organisation (Command, Control & Discipline):

1. Empowers the central government to constitute Inter-Services Organizations.

2. Acts as enabling legislation without changing existing service Acts/Rules/Regulations.

3. Service personnel continue to be governed by their respective Service Acts.

4. Empowers Heads of Inter-Services Organizations to exercise disciplinary and administrative powers.

5. Applicable to regular Army, Navy, Air Force personnel, and other forces notified by the central government.

6. Grants disciplinary and administrative powers to the Commander-in-Chief, Officer-in-Command, or specially empowered officer.

7. Defines Commander-in-Chief or Officer-in-Command.

8. Empowers Acting Incumbent or Officer-in-Command to initiate action in the absence of the Commander-in-Chief or Officer-in-Command.

9. Authorizes the Commanding Officer of an Inter-Services organization to initiate disciplinary or administrative actions.

4. Bridging the Gap: The Missing Link of India's Defence Strategy

The absence of a dedicated Indian Defence University (IDU) raises concerns about India's ability to adapt to the evolving nature of modern warfare and cultivate strategic thinking within its armed forces.

Need for a Defence University

1. **Dynamic warfare**: Warfare today is constantly changing and can be quite unpredictable. Drones, cyber-attacks, and even social media now play major roles in conflicts. In such scenario, a Defence University is needed to train military personnel to be flexible, innovative, and ready to respond to these dynamic challenges.

2. **Strategic thinking**: Through case studies, defence exercises, and practical applications, military leaders learn to assess risks, weigh options, and develop comprehensive strategies for various contingencies.
   E.g., study of historical battles or international conflicts to extract lessons.

3. **Development of leadership**: Effective leadership is crucial in military, as it directly impacts morale, cohesion, and operational effectiveness of forces. Leadership courses like role-playing exercises, mentorship programs from retired personnel, and experiential learning helps in building capabilities among the commanders.

4. **Better execution of plans:** A Defense University emphasizes the importance of translating strategic objectives into actionable plans and executing them with precision. Through realistic simulations military personnel learn to adapt to unforeseen circumstances, communicate effectively, and collaborate with different teams to achieve mission success.

Conclusion

The establishment of the Indian Defence University is crucial for India to meet the challenges of 21st-century warfare. By investing in strategic education and leadership development, India can ensure that its armed forces are equipped with the knowledge and skills needed to safeguard national security.

5. Indian Navy Submersible Platform 'SPACE'

The Indian Navy's cutting-edge **Submersible Platform for Acoustic Characterization and Evaluation (SPACE)** was inaugurated in Idukki, Kerala.

   a. **Naval Physical & Oceanographic Laboratory, DRDO set up this platform as a premium testing** and evaluation hub for sonar systems used by the Navy on various platforms such as ships, submarines, and helicopters.

Components of SPACE Submersible:

1. **SPACE comprises 2 primary components:** a f**loating platform on the water surface** and a submersible platform lowerable to **depths of 100 metres using winch systems.**

2. The submersible platform is **easily winchable and dockable with the floating platform after operations.**
   a. A winch system uses a motor and cable to raise and lower the submersible platform

Capabilities of SPACE Submersible:

1. SPACE **primarily evaluates complete sonar systems, ensuring quick deployment and effortless recovery of scientific equipment like sensors and transducers.**

2. It facilitates surveying, sampling, and **data collection of air, surface, mid-water, and reservoir floor parameters using advanced scientific instrumentation.**

3. The platform supports data processing and sample analysis in well-equipped scientific laboratories.

Significance of SPACE:

1. The inauguration of **SPACE is a milestone in naval technology advancement for the Indian Navy.**

2. Dedicated to testing and evaluating sonar systems, this platform enhances the **Navy's Anti-Submarine Warfare research capabilities.**

3. It also **aids in developing modern scientific instrumentation** and data processing techniques for underwater acoustic research.

4. This **cutting-edge platform allows the Navy to test and evaluate sonar systems with precision and efficiency,** contributing to naval technology and scientific instrumentation modernization.

D. ECONOMY

1. Countercyclical Capital Buffer

The Reserve Bank of India (RBI), in April 2024, said that based on a review the central bank has decided that it is not necessary to activate countercyclical buffer at this point.

The Framework on Countercyclical Capital Buffer

1. The Reserve Bank of India (RBI) set up the countercyclical capital buffer (CCyB) in February 2015.
2. The CCyB will be **activated when needed**, and this decision will usually be announced in advance.
3. The framework uses the **credit-to-GDP gap** as the main indicator, along with other supplementary indicators.

About credit-to-GDP Gap

1. The credit-to-GDP gap is a **financial indicator** that measures the difference between the current ratio of credit to GDP and its long-term trend.
2. It is used to assess the extent to which **credit levels in an economy** are above or below their long-term trend, which can indicate potential financial imbalances.
3. This gap **helps regulators determine** when to implement measures like the countercyclical capital buffer (CCyB) to stabilize the financial system.

About Capital Buffers

1. A capital buffer is extra capital that financial institutions must keep in addition to their basic requirements.
2. These buffers are **part of the Basel III reforms** by the **Basel Committee on Banking Supervision**.
3. The Basel Committee issued regulatory requirements in December 2010 to make the global banking system more resilient (strong, quick to recover), especially regarding liquidity.
4. Basel III reforms identify various buffers, including countercyclical capital buffers and capital conservation buffers.

About Countercyclical Capital Buffer

1. CCyB is a regulatory measure for banks which aimed at strengthening the banking system during **economic booms** and reducing the risk of financial crises.
2. When the economy is doing well, banks lend a lot of money, which can lead to **too much borrowing** and create a financial bubble.
3. While, when the **economy is doing poorly**, banks lend less money, which can make the recession worse.
4. The CCCB is designed to **counter act these cycles**. The CCyB makes banks hold extra money during good economic times. This extra money helps them stay strong and safe if the economy turns bad.
5. When the economy is doing well, banks are required to save more money as a **safety net**. This means they might lend a bit less than they otherwise would, which helps reduce the risks.
6. When the economy is doing poorly, the rules are relaxed so banks can use the extra money they saved up during good times. This helps them continue lending and supporting the economy.

Related Term: Capital Conservation Buffer

1. **Banks are required to hold** a certain amount of capital to cover potential losses. The Capital Conservation Buffer is an additional amount of capital that banks must hold on top of this minimum requirement.
2. This buffer acts as a cushion during tough times, like **economic downturns** or unexpected losses.
3. Basel standards mandate the buffer's gradual implementation, reaching a total of 2.5% by March 31, 2019.
4. It was introduced after the **2008 financial crisis** to help banks withstand tough economic times.

About Basel III

1. In December 2010, the **Basel Committee on Banking Supervision** published 'Basel III: A global regulatory framework for more resilient banks and banking systems.'

2. This document outlines global regulatory standards on bank capital adequacy and liquidity, including the countercyclical capital buffer.

   a. **Bank capital adequacy** essentially refers to how much financial cushion a bank has to absorb potential losses.

   b. Capital adequacy rules ensure banks have enough of this cushion to handle tough times without collapsing. It's like having enough savings to cover unexpected expenses.

2. RBI Eases FEMA Regulations

1. In Apr 2024, the **Reserve Bank of India** has eased the **Foreign Exchange Management Act (FEMA) regulations** to **increase foreign investment in derivatives**.

   a. A **derivative** is a type **of financial security** that is set between two or more parties. Derivatives can be of many forms such as stock and bond derivatives, economic indicator derivatives, etc.

2. These changes aim to make it easier for both foreign and domestic investors to manage margins when trading in authorized derivatives, both domestically and internationally.

   a. **Margin management** in derivatives refers to the **process of maintaining adequate funds in a trading account to cover potential losses** from trading derivative contracts like futures or options.

Present Mechanism

1. RBI permits various types of derivative contracts including **interest rate swap, forward rate agreement, interest rate future and foreign currency derivatives, foreign currency forward, currency swap** and **currency option**.

   a. A **currency swap** is a financial agreement between two parties to exchange (swap) specific amounts of different currencies and, over time, to repay the exchanged amounts along with interest.

   b. An **interest rate swap** is an agreement between two parties to exchange (swap) future interest payments based on a specified principal amount. The principal itself is not exchanged.

   • This is useful if one party prefers a fixed interest rate and the other prefers a floating (variable) interest rate.

   c. A **Forward Rate Agreement (FRA)** is a financial contract between two parties to lock in an interest rate on a specified amount of money for a future period.

   • The agreed interest rate is fixed, regardless of what happens to market interest rates in the meantime.

   d. **Interest Rate Futures** are financial contracts that allow you to buy or sell a specific amount of a financial instrument or an asset at a predetermined interest rate on a specified future date.

   e. **Foreign Currency Derivatives:** Tools to manage the risk of exchange rate fluctuations, including forwards, futures, options, and swaps.

   • These help businesses and investors manage their currency exposure and protect against adverse currency movements.

   f. **A currency option** provides a way to manage the risks associated with fluctuating exchange rates, offering both protection and potential profit opportunities depending on market movements.

2. Similarly, **equity derivatives** comprise **forward contracts, futures contracts, options contracts**, and **swap contracts**.

   a. **A forward contract** is a private agreement between two parties to buy or sell an asset at a specific price on a future date.

   b. **A futures contract** is similar to a forward contract but is traded on an exchange. This means it has standardized terms and is regulated. Both parties agree to buy or sell an asset at a future date for a price set today.

   c. **An options contract** gives the buyer the right, but not the obligation, to buy or sell an asset at a specific price before a certain date. There are two types of options:

- **Call Option:** The right to buy an asset at a specific price.
- **Put Option:** The right to sell an asset at a specific price.

Recent Changes

1. **Authorized Dealers (ADs)** in India are now allowed to permit persons resident outside India to open and maintain interest-bearing accounts.
   a. Interest-bearing accounts, like savings accounts, are deposit accounts that pay interest to the account holder for keeping their money deposited.
   b. The institution pays interest because the account holder's funds are used to lend to other customers.
2. These accounts can be **in Indian Rupees and/or foreign currency** and are specifically for collecting margin in India for permitted derivative contracts.

Benefits for Non-Residents:

1. Non-residents can now open and maintain interest-bearing accounts with ADs in India for margin-related purposes.
2. They can earn interest on these funds instead of keeping them idle.
3. Having a dedicated account for margin requirements makes it easier for non-residents to manage their margin obligations and funds related to permitted derivative contracts in India.

About the Foreign Exchange Management Act, 1999

1. The Foreign Exchange Management Act, 1999 (FEMA) provides the legal framework for managing foreign exchange transactions in India.
2. FEMA classifies all foreign exchange transactions as either capital or current account transactions.
   a. **Current Account Transactions:** These are transactions by a resident that do not change their assets or liabilities outside India. Examples include payments for foreign trade, foreign travel expenses, and education.

   b. **Capital Account Transactions:** These transactions by a resident of India change their assets or liabilities outside India. Examples include investments in foreign securities and buying property outside India.
3. **Resident Indians:**
   a. Defined in **Section 2(v) of FEMA, 1999**.
   b. A person living in India for **more than 182 days** in the previous financial year.
   c. Includes any person or corporate body registered or incorporated in India.

3. New Framework for Grading CPSE

The process for **upgrading and downgrading** of categorized Central Public Sector Enterprises (CPSEs) to higher or lower schedules has been simplified, with the **finance minister** now serving as the final authority for grading CPSEs.

Categorization of Central Public Sector Enterprises

1. Central Public Sector Enterprises (CPSEs) in India are categorized into four schedules — A, B, C, and D — which influence their organizational structure and the salaries of Board-level incumbents. As of June 26, 2023, the categorization is as follows:
   a. **Category A**: 71 CPSEs (including NTPC, Indian Oil, ONGC, SAIL, BHEL)
   b. **Category B**: 68 CPSEs (including Air India Assets Holding, Cement Corporation, Garden Reach)
   c. **Category C**: 38 CPSEs
   d. **Category D**: 5 CPSEs
2. Additionally, CPSEs are classified into **four Ratna statuses** — Maharatna, Navratna, Mini Ratna-I, and Mini Ratna-II — to define their financial and organizational powers.
3. **Criteria for Ratna Status**
4. **Maharatna**:
   a. Must have **Navratna status**.
   b. Listed on the Indian stock exchange with the minimum prescribed public shareholding under SEBI regulations.

c. Average annual turnover of more than ₹25,000 crore over the last three years.

d. Average annual net worth of more than ₹15,000 crore over the last three years.

e. Average annual net profit after tax of more than ₹5,000 crore over the last three years.

f. Significant global presence/international operations.

5. **Navratna**:
   a. Must be a **Miniratna I** and Schedule 'A' CPSE.
   b. Obtained an 'excellent' or 'very good' **MOU rating** in three of the last five years.
   c. **Composite score of 60** or above in the following performance indicators:
      i. Net Profit to Net Worth: 25%
      ii. Manpower Cost to Total Cost of Production or Cost of Services: 15%
      iii. PBDIT to Capital Employed: 15%
      iv. PBIT to Turnover: 15%
      v. Earnings Per Share: 10%
      vi. Inter-Sectoral Performance: 20%

6. **Miniratna**:
   a. **Category-I**:
      i. Profit in the last three years continuously.
      ii. Pre-tax profit of ₹30 crore or more in at least one of the three years.
      iii. Positive net worth.
   b. **Category-II**:
      i. Profit in the last three years continuously.
      ii. Positive net worth.

7. **Additional Criteria for Miniratna Status**
   a. Should **not have defaulted** in the repayment of loans/interest payments on any loans due to the Government.
   b. Should **not depend on budgetary support** or Government guarantees.

8. These classifications and criteria aim to enhance the **efficiency, competitiveness, and financial autonomy** of CPSEs in India.

Process for Upgradation

The process for the upgrading and categorization of CPSEs involves several steps and criteria:

1. **Proposal Submission**:
   a. All categorized CPSEs must submit proposals for upgrading their schedule to the Department of Public Enterprises (DPE).
   b. Proposals must have the approval of the respective Administrative Ministry or Department and the concurrence of the Financial Advisor.
   c. Approval of the Minister-in-charge of the Administrative Ministry/Department is also required.

2. **Content of Proposal**:
   a. **Quantitative Parameters:**
      i. Investment
      ii. Capital employed
      iii. Net sales
      iv. Profit before tax
      v. Number of employees and units
      vi. Capacity addition
      vii. Revenue per employee
   b. **Qualitative Factors**:
      i. National importance
      ii. Complexities of problems faced
      iii. Technology
      iv. Expansion prospects and diversification
      v. Competition
      vi. Share price
      vii. Maharatna/Navratna/MiniRatna status
      viii. ISO certification

3. **Examination and Approval**:
   a. The DPE examines the proposal based on the above parameters.
   b. The Finance Minister is the final authority to approve the upgrade.
   c. Proposals do not need to be referred to the Cabinet Secretariat and the Public Enterprises Service Board (PESB).

4. This streamlined process aims to facilitate efficient and timely decisions regarding the categorization and upgrading of CPSEs, ensuring they align with their performance and strategic importance.

4. Corporate Governance for Startups

Recently, the **Confederation of Indian Industry (CII)** launched a corporate governance **charter for startups**, which includes a self-evaluative scorecard.

This initiative comes at a time when **companies** like Byju's, BharatPe, and Zilingo have **raised concerns about governance norms** over the past 12-18 months.

What is a Startup?

1. According to the **Department for Promotion of Industry and Internal Trade** (DPIIT), to be eligible for recognition as a startup, a company must meet the following criteria:
   a. Have been in **operation for no more than 10 years** since its incorporation.
   b. Be **registered as a** Private Limited Company, a Registered Partnership Firm, or a Limited Liability Partnership.
   c. Have an **annual turnover** not exceeding Rs. 100 crore for any financial year since its incorporation.
   d. Not have been formed by splitting up or reconstructing an already existing business.

Startup in India

1. As of May 2023, India boasts the **world's third-largest startup ecosystem**, projected to sustain annual growth of 12-15%.
2. It **ranks second in innovation quality** among middle-income economies, excelling in scientific publications and university standards.
3. India is also home to **108 Unicorns**, collectively valued at USD 340.80 billion.

Provisions of the Charter

1. The charter will provide tailored corporate governance **suggestions and guidelines for startups at various stages**, aiming to enhance governance practices, which in India consist of the rules, practices, and processes that guide and control companies.

2. The charter includes an **online self-evaluative governance** scorecard for startups to assess and track their governance status and improvements over time, with score changes reflecting their progress in governance practices.

3. **Stages of Guidance to Startup:**
   a. At the **inception stage**, the focus of a startup will be on board formation, compliance monitoring, accounting, finance, external audit, policies for related-party transactions, and conflict resolution mechanisms.
   b. In the **progression stage**, a startup may additionally focus on monitoring key business metrics, maintaining internal controls, defining a hierarchy of decision-making, and setting up an audit committee.
   c. For the **growth stage**, the focus will be on building stakeholder awareness of the organization's vision, mission, code of conduct, culture, and ethics; ensuring diversity and inclusion on the board; and fulfilling statutory requirements according to the Companies Act 2013 and other applicable laws and regulations.
   d. At the going **public stage**, the startup will focus on expanding its governance by monitoring the functioning of various committees, emphasizing fraud prevention and detection, minimizing information asymmetry, and evaluating board performance.

4. **Business valuations** should be kept realistic, with startups striving for long-term value creation rather than short-term gains.

5. The business's needs should be distinct from the **personal needs** of its founder(s), while aligning the goals and needs of the founders, promoters, and initial investors with the long-term objectives of the business.

6. The startup should be maintained as a **separate legal entity**, keeping the organization's assets distinct from the founders' assets.

What is Corporate Governance?

1. Corporate governance, encompassing rules, practices, and processes, directs and controls a company, **ensuring ethical operations** aligned with stakeholder interests.

2. It upholds stringent ethical standards and **fosters accountability** among individuals for their actions.

3. In India, the **regulatory framework** comprises the Companies Act, 2013, SEBI overseeing the securities market, ICAI setting accounting standards, and ICSI issuing secretarial standards under the Companies Act, 2013.

4. **Committees related to corporate governance**: National Task Force on Corporate Governance, Kumar Mangalam Birla Committee (1999), Naresh Chandra Committee (2002), Narayana Murthy Committee (2003).

Principles of Corporate Governance

1. It enforces strong **ethical standards** and holds individuals accountable for their actions within the company.

2. **Fair treatment** of shareholders, employees, vendors, and communities is a cornerstone of effective corporate governance.

3. **Accountability** is maintained through clear articulation of company objectives and transparent reporting on performance.

4. **Transparency** ensures timely and accurate disclosure of financial performance, conflicts of interest, and risks to stakeholders.

5. Effective **risk management** involves identifying, assessing, and mitigating risks, with actions taken based on informed recommendations and communication with relevant parties.

Issues in Corporate Governance

1. **Board members** often include **associates and relatives** of company owners, impacting board objectivity.

2. **Performance evaluation** results of directors may not be shared publicly to **avoid scrutiny** and negative feedback.

3. **Independent directors** can be removed by promoters if they **oppose decisions**, compromising their autonomy.

4. **Founders' control** over company affairs can disrupt corporate governance and succession planning.

5. Unlike in developed economies, the **identity of the founder** and the company are often **intertwined** in India.

How to improve corporate governance?

1. **Strengthen Regulatory Framework**: Regularly update and enforce corporate governance regulations to align with global best practices.

2. **Independent Directors and Board Diversity**: Enhance the autonomy and effectiveness of independent directors, ensuring diverse perspectives and expertise in decision-making.

3. **Transparency and Disclosure**: Mandate comprehensive and timely disclosure of financial information, ownership structures, related-party transactions, and corporate governance practices.

4. **Shareholder Rights and Activism**: Empower shareholders with enhanced rights, including voting privileges, information accessibility, and involvement in critical decisions.

5. **Stakeholder Engagement**: Foster constructive dialogue and engagement with all stakeholders to build trust and collaboration.

6. **Continuous Evaluation and Improvement**: Implement mechanisms for ongoing evaluation and benchmarking of corporate governance practices.

7. **Adaptation to Feedback**: Regularly seek feedback from stakeholders and adjust policies and procedures accordingly to improve governance effectiveness.

5. External Commercial Borrowings (ECB)

As per the latest RBI data, registrations for External Commercial Borrowings (ECBs) by Indian companies surged by approximately 84% in FY24, reaching $49.2 billion. This marks a substantial increase from $26.7 billion registered in FY23.

What are External Commercial Borrowings (ECB)?

1. External Commercial Borrowings (ECBs) in India are **loans extended by non-resident lenders** in foreign currency to Indian borrowers, primarily corporations and public sector undertakings (PSUs).

2. These borrowings are crucial in providing **Indian entities access to foreign capital**.

3. ECBs encompass various forms of financing such as commercial bank loans, buyers' credit, suppliers' credit, securitized instruments like floating rate notes and fixed-rate bonds, and credit from official export credit agencies.

4. **Key points about ECBs include:**

   a. **Usage**: ECBs are utilized for funding capital expenditures, project finance, modernization, and expansion of existing production units in India. They cannot be used for investments in the stock market or speculative real estate activities.

   b. **Regulation**: The Department of Economic Affairs (DEA) under the Ministry of Finance, in conjunction with the Reserve Bank of India (RBI), regulates and oversees ECB policies and guidelines. These regulations ensure that ECBs contribute to productive investments and do not pose undue risks to the Indian economy.

   c. **Capital Account**: ECBs are classified under the Capital Account in India's Balance of Payments (BoP). They reflect inflows and outflows of capital related to borrowing and lending activities between Indian and non-resident entities.

   d. **Purpose and Restrictions**: Borrowers must adhere to specific end-use restrictions and reporting requirements set by the RBI and DEA. The regulatory framework aims to maintain financial stability, prevent currency volatility, and safeguard the integrity of India's external debt profile.

   e. **Types of Lenders**: Lenders of ECBs include international financial institutions such as the International Finance Corporation (IFC) and multilateral development banks like the Asian Development Bank (ADB), as well as commercial banks and other financial entities abroad.

5. Overall, ECBs play a pivotal role in India's economy by facilitating access to foreign funds for developmental projects and corporate activities, while stringent regulations ensure responsible borrowing and lending practices.

What is Balance of Payments (BoP)?

1. The balance of payments (BoP) **records the transactions** in goods, services, and assets between residents of a country and the rest of the world for a specified period typically a year.

2. It represents a **summation of the country's current demand and supply** of the claims on foreign currencies and of foreign claims on its currency.

3. The BoP has two main accounts – the current account and the capital account.

4. **Current Account**: The current account records exports and imports of goods, trade in services and transfer payments.

5. **Capital Account**: The capital account records all international purchases and sales of assets such as money, stocks, bonds, etc. It includes foreign investments and loans.

6. India-China Consumption Pattern

In 2023, **India** surpassed China to become the **world's most populous** country, leading to significant **changes in consumption patterns**. While China's ageing population shifts demand towards healthcare and senior services, India's youthful and growing population drives increased demand for education, housing, consumer electronics, and food products.

Population Dynamics

1. **China's declining birth rate** (6.4 births per 1,000 people) and low total fertility rate (~1%) are increasing the dependency ratio, projected to rise further.

2. In contrast, **India's total fertility rate** has reached replacement levels (2.1), with its population expected to peak around 2060.

3. These **demographic differences affect consumption patterns**: India's younger, growing population implies a rising consumer base, while China's ageing population may lead to decreased consumption over time.

Consumption Expenditure: India vs China

1. **India's Private Final Consumption Expenditure (PFCE)** contributes over **58% to GDP**, underscoring the crucial role of consumption in driving economic growth.

2. In contrast, **China's PFCE** accounts for **only 38% of GDP**, indicating a lower reliance on consumer spending.

3. Including **government consumption**, final consumption constitutes 68% of GDP in India and 53% in China, implying that the government is a significantly larger consumer in China.

4. Moreover, while **India's percentage is steadily increasing**, China's has been on the decline

5. Despite China's economy being approximately five times larger than India's, its PFCE is only about 3.5 times that of India's.

6. This indicates that **consumption is a more substantial contributor** to India's GDP.

7. Notably, **India** is expected to equal China's consumption level at a significantly **lower GDP** (~$10 trillion) compared to China, which achieved this scale at approximately $17 trillion.

8. **PFCE remained stable** during 2020 (the pandemic year) but saw a significant uptick in 2021.

9. However, **2022 witnessed a decline** in both aggregate PFCE ($6.6 trillion compared to $6.8 trillion) and per capita PFCE ($4,730 compared to $4,809).

10. In contrast, India experienced a steady increase in PFCE from $1.64 trillion in 2018 to $2.10 trillion in 2022, with marginal growth in **both aggregate and per capita** PFCE in 2022.

11. Consequently, the **expenditure gap** between the two countries widened from $3.8 trillion in 2018 to over $4.5 trillion in 2022.

Ratio Comparison and Per Capita Analysis

1. India has been **closing the gap with China** in terms of the PFCE ratio, improving from approximately 3.3 to about 3.1, indicating India's higher growth rate compared to China.

2. However, in **per capita PFCE**, China slightly widened the gap from around 3.0 times that of India in 2018 to approximately 3.1 in 2022, attributed to China's negative population growth in 2022.

3. Comparing nominal PFCE figures alone can be **misleading** due to discrepancies in the cost of living.

4. Consumption is not just about **consumed value** but also **consumed volume**, and nominal figures only give an idea of the total consumption value.

5. Thus, **comparing PPP figures** is imperative for a better understanding of consumption by value. In PPP terms, the gap between China's and India's PFCE narrows down further.

6. China's PFCE (PPP) is approximately 1.5 times that of India's, and China's GDP (PPP) is about 2.5 times that of India's.

7. The **relative gap widened** from about 1.58 in 2018 to around 1.66 in 2020 and 2021, but in 2022, India closed the gap to approximately 1.55.

Expenditure Between India and China

1. **Food, Clothing, and Transport**:
   a. **India**: Prioritizes spending on food, clothing, footwear, and transport, reflecting the significant allocation towards basic needs typical in developing markets.
   b. **China**: While food and beverages still dominate, the proportion of spending in this category is decreasing as the market matures.

2. **Aggregate Spending Comparison**:
   a. India spends approximately half of what China allocates to food, transport and communication, and clothing and footwear.
   b. Despite India's economy being a fifth of China's size, these categories remain substantial in expenditure, underscoring India's developmental stage.

3. **Housing, White Goods, and Recreation**:
   a. **China**: Shows higher expenditure on housing, white goods (appliances), recreation, education, and healthcare, characteristic of a more developed market.
   b. **India**: Allocates less spending to these categories, reflecting its status as a developing market with evolving consumption patterns.

Chart 13: China's expenditure in % by category (2022)

Miscellaneous: 2.4
Clothing and footwear: 5.6
Household equipment: 5.8
Healthcare: 8.6
Education and culture: 10.1
Transport: 13
Food, Tobacco: 30.5
Housing: 24

Chart 14: India's expenditure in % by category (2021-22)

Communication: 2.5
Household equipment: 3
Education: 4.5
Healthcare: 5.2
Clothing and footwear: 6.1
Housing: 13.2
Miscellaneous: 14.5
Food, Tobacco: 32.5
Transport: 16.3

Comparative Analysis

1. In **advanced economies** like the U.S., Japan, EU, Germany, and the U.K., food expenditure isn't among the **highest spending** categories. This reflects higher overall consumer spending on other goods and services **beyond necessities**.

2. **China's decreasing percentage of spending on food** as its market matures signals progression toward a developed market status. This shift is indicative of broader economic development and changing consumer preferences.

3. **India often sees real growth rates in individual consumption** categories outperforming nominal growth rates observed in China. This underscores a robust and expanding consumer base with increasing purchasing power.

4. The growing **consumer class in India**, coupled with increased spending, enhances its attractiveness to foreign businesses. This trend is particularly relevant amid the China+1 strategy, where companies are diversifying their supply chains and consumer markets beyond China to include India and other countries.

7. European Union Deforestation-Free Products Regulation

1. The European Union (EU) recently introduced the European Union Deforestation-Free Products Regulation (EUDR), which aims to **address deforestation** and **promote sustainability** in global supply chains.

2. This regulation will have significant **implications for India's exports**, affecting key industries such as coffee, leather, paper, and wooden furniture.

What is EUDR?

1. The EUDR **applies to a wide range of products**, including meat, leather hide, wood furniture, paper, and coffee.

2. Exporters must certify that their products have **not been produced** on land deforested **after December 31, 2020**.

3. Certification must also ensure that **products** are **free from biodiversity loss** and human rights exploitation.

4. **Exporters** need to show **adherence to various domestic laws** related to land use rights, labour rights, human rights, Indigenous rights, and anti-corruption measures.

5. The certification process imposes **additional compliance costs on exporters**, which may affect their profitability and competitiveness.

6. At a recent **WTO meeting** in Geneva, India and several other **members expressed concerns** about the EUDR.

7. These countries collectively requested a **postponement of the regulation's implementation**, which is set to begin on December 30, 2024, to allow more time for adjustment and compliance.

8. The EUDR reflects the **EU's commitment to sustainability**, which could influence global supply chain practices.

9. The regulation may set a precedent for other regions to **adopt similar measures**, potentially reshaping international trade norms and practices.

Impact on India's Exports

1. **Overall Impact**
   a. India's exports to the EU, valued at approximately **$1.3 billion** annually, will be significantly impacted by the EU deforestation regulations.
   b. **Key products** including coffee, leather hides, paper, and wooden furniture will require compliance with the regulation's requirements.

2. **Coffee Exports**
   a. Coffee is one of India's **major exports to the EU**, accounting for over 50% of Indian coffee exports.
   b. The EUDR will impose **additional compliance costs** on coffee exporters.
   c. **Exporters** will need to **ensure** that their coffee beans are sourced from plantations that have **not contributed to deforestation** since December 2020.

3. **Leather Hides and Skins**
   a. Leather hides and skins constitute **30%-40% of India's exports** to the EU.
   b. Exporters will need to demonstrate that the leather has **not been produced on land cleared of forests** after the specified date.
   c. **Compliance** with the EUDR will impose **additional costs** on exporters to ensure adherence to the deforestation-free requirement.

4. **Paper and Wooden Furniture**
   a. The paper and wooden furniture industries will also be affected by the EUDR.
   b. Exporters in these sectors will need to ensure that their products are sourced from sustainable and deforestation-free supply chains.
   c. Meeting the requirements of the EUDR will add a **compliance burden** on exporters, potentially affecting their competitiveness in the EU market.

Challenges for Indian Exporters

1. **Compliance Costs**: Certification and due diligence requirements impose significant **financial burdens** on exporters.

2. **Impact on SMEs**: Small and medium-sized enterprises (SMEs) are particularly **vulnerable**. High compliance costs may exclude them from global agricultural trade, reducing their competitiveness in the EU market.

3. **Traceability Issues**: Ensuring traceability and verifying the **origin of products** is challenging due to complex supply chains with multiple intermediaries.

4. **Robust Tracking Systems**: Exporters need to establish robust systems for **tracking** and documenting the entire **supply chain** to meet EUDR requirements. This includes maintaining records of land use, deforestation status, and adherence to various laws.

5. **Detailed Documentation**: Exporters must provide **detailed documentation** proving that their products are deforestation-free.

6. **Ongoing Monitoring**: Continuous monitoring and updating of records are required to maintain compliance, adding to the **operational burden**.

7. **Multi-Faceted Regulations**: Compliance involves not just deforestation-free certification but also **adherence to domestic laws** related to land use rights, labour rights, human rights, Indigenous rights, and anti-corruption measures.

8. **Legal and Regulatory Knowledge**: Exporters must have **comprehensive knowledge** of both EU and Indian laws to ensure full compliance, necessitating legal and regulatory expertise.

Strategies for Indian Exporters to Navigate EU Deforestation Regulations

1. **Invest in Certification Processes**: Allocate resources to obtain certifications that verify products are sourced from **deforestation-free supply chains**.

2. **Implement Traceability Systems**: Establish **robust systems** to track the origin of products throughout the supply chain, ensuring transparency and compliance with EUDR requirements.

3. **Engage with Industry Associations**: Partner with industry bodies to **exchange knowledge** and best practices for complying with regulations.

4. **Cooperate with Certification Agencies**: Work closely with recognized certification agencies to **streamline** the certification process and **reduce costs** through collective efforts.

5. **Promote Sustainable Farming**: Encourage the adoption of sustainable farming methods among suppliers to **minimize environmental impact**.

6. **Responsible Land Use**: Ensure responsible land use practices that do not contribute to deforestation or biodiversity loss.

7. **Support Conservation Initiatives**: Engage in initiatives that protect forests and biodiversity, aligning with **global sustainability goals**.

8. **Blockchain for Traceability**: Explore blockchain technology to enhance supply chain transparency. Implementing blockchain-enabled systems can provide **immutable records** of product origins and compliance status.

9. **Digital Tools for Accountability**: Utilize digital tools and platforms for **real-time monitoring** and reporting, improving accountability in supply chain management.

Navigating the EU Deforestation Regulations requires Indian exporters to adopt proactive strategies such as investing in certification, enhancing traceability, collaborating with stakeholders, adopting sustainable practices, and leveraging technology. By aligning with these strategies, exporters can mitigate compliance risks, enhance market access, and sustainably grow their exports to the EU market.

8. Poultry Industry in India

According to projections from **FAO and OECD** until 2032, **global poultry meat consumption** is expected to experience the **highest growth**, driven by factors including affordability. Consumption is expected to increase by approximately 15% over the next decade.

Current Scenario

1. Poultry is one of India's **fastest-growing agricultural sectors** today.

2. India **ranks 3rd globally** in total egg production (Source: FAO).

3. The **Indian poultry market, valued at USD 28.18 billion**, is projected to grow at a CAGR of 8.1% from 2024 to 2032, reaching approximately USD 44.97 billion by 2032 (Source: EMR Market Research).

4. In the fiscal year 2022-23, **India exported poultry** and poultry products to 64 countries, generating **USD 134 million** in revenue.

Meat & Poultry Production in India
Species wise meat production (%)

Poultry meat 36%, Buffalo meat 22%, Goat meat 18%, Pig meat 9%, Sheep meat 8%, Other meat 6%

Source: Department of Animal Husbandry, Dairying and Fisheries (DAHD)
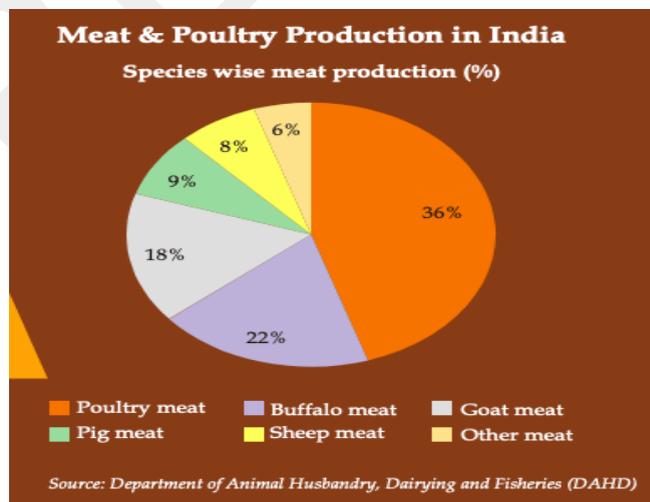
The Potential of the Poultry Sector in India

1. **Rising per capita income** and an expanding middle class have shifted dietary preferences towards protein-rich foods.

2. The **growing urban population** has significantly boosted demand, making India one of the largest consumers of poultry products.

3. **Decreasing real poultry prices**, supported by automation and government initiatives, have further stimulated consumption.

4. As the **largest producer of several agricultural commodities**, India benefits from a strong domestic market pull.

5. **Substantial investments** in world-class ports and improvements in **logistics and supply chain** infrastructure have enhanced distribution capabilities.

6. Government policies promoting the **food processing sector**, such as 100% FDI through the automatic route and the mega food park scheme, have facilitated growth and development in the industry.

Challenges in the Poultry Sector in India

1. **Disease outbreaks** like Avian Influenza (Bird Flu) lead to poultry culling, order cancellations, and price hikes, severely impacting the industry.

2. **Shortages in raw materials**, such as the price increase in soybean meal, force feed manufacturers to compromise on bird diets.

3. The **shortage of skilled human resources**, including veterinarians and researchers, in critical areas affects the sector's operational efficiency.

4. The Indian poultry sector faces challenges in **accessing international markets** due to inadequate cold storage and warehouse facilities.

5. A large portion of poultry production comes from the **unorganized sector**, focused on backyard farming for supplementary income. Only about 1% of processed poultry undergoes value-added processing (ready-to-eat/ready-to-cook products).

6. High levels of **antibiotics** in poultry products contribute to long-term health risks such as antibiotic resistance in consumers.

7. Lack of a comprehensive **regulatory authority** hampers hygiene standards and the issuance of licenses to businesses.

8. **Close proximity** of birds **to waste** and other birds increase the risk of contaminants like **salmonella**, posing health risks to consumers.

What could be done?

1. Launch **social awareness campaigns** to educate communities on hygienic practices in poultry rearing, slaughtering, and storage to enhance food safety and quality.

2. Implement a supportive policy framework at the central level to **promote bio plants** for poultry waste management and organic mass utilization across the country.

3. Establish national **geographical zoning** to mitigate economic repercussions in case of bird influenza outbreaks in specific regions.

4. Focus on **infrastructure development**, particularly cold chain and processing units, to stabilize the poultry sector amidst year-round consumption fluctuations influenced by religious and cultural factors.

5. Promote **brand development** for indigenous poultry breeds like Kadaknath, highlighting unique attributes and qualities to enhance market value and recognition.

9. Oligopoly

Political competition and **oligopolistic competition** share intriguing similarities that are often overlooked.

What is Oligopoly?

1. Oligopoly, an important economic concept, refers to a **market structure** where a **small number of large firms dominate**, each wielding substantial market power.

2. Oligopolies are a **global concern** due to their significant barriers to entry for new participants.

   a. These barriers include **high startup costs**, regulatory hurdles, and challenges in accessing supply and distribution channels.

3. As a result, **entering the market can be difficult**, limiting competition and potentially harming consumer choice and market efficiency.

What are the Sources of Oligopolistic Power?

1. **Economies of Scale**: Oligopolistic firms benefit from producing at large scales, which lowers their average costs per unit. This cost advantage makes it hard for smaller firms to enter the market.

2. **Collusion and Price Setting**: Oligopolies may collude to set prices together, maintaining higher prices and avoiding intense price competition found in more competitive markets.

3. **Barriers to Entry**: Entry barriers like high capital requirements, strict regulations, and strong customer loyalty make it difficult for new firms to challenge established oligopolies, reinforcing the market power of existing players.

4. **Non-Price Competition**: Oligopolies use strategies like advertising, product differentiation, and customer service improvements instead of price cuts. This strengthens their market position and deters new entrants.

5. **Information Advantage**: Oligopolies have detailed knowledge about costs and demand, giving them strategic advantages. Information gaps between competitors can also give certain firms an edge.

Potential Outcomes of Oligopolies

1. **Formation of Cartels**: Firms in oligopolies may form cartels to limit production, raise prices, and increase profits. Cartels engage in anti-competitive practices and are closely monitored and regulated by authorities.

2. **Efficiency vs. Competition**: Oligopolies can achieve efficiency through innovations, economies of scale, and productivity improvements. However, excessive market power can stifle competition and hinder innovation in the long term.

3. **Price Wars**: Competition among oligopolistic firms can lead to price wars, where companies aggressively lower prices to gain market share. While consumers benefit from lower prices initially, this can reduce profitability and lead to industry consolidation over time.

4. **Market Concentration and Inequality**: Oligopolies concentrate market power among a few firms, contributing to income inequality and limiting consumer choice. This concentration affects market dynamics and economic diversity.

5. **Regulatory Challenges**: Regulating oligopolies poses challenges for competition authorities. Effective enforcement of antitrust laws is crucial to ensure fair competition, prevent collusion, and protect consumer interests.

The Competition Commission of India (CCI)

1. The Competition Commission of India (CCI) was established in March 2009 under the **Competition Act, 2002** by the Government of India. It operates within the Ministry of Corporate Affairs and is responsible for enforcing the Act.

2. **Key Responsibilities of CCI:**
   a. **Eliminate Harmful Practices**: CCI investigates and eliminates practices that harm competition in India.
   b. **Promote Competition**: It works to promote and maintain fair competition in the Indian market.
   c. **Consumer Protection**: CCI protects consumer interests by ensuring competitive prices and choices.
   d. **Market Freedom**: It ensures freedom of trade in Indian markets, supporting fair business practices and economic growth.

10. Jobless Growth

Even though India's economy is growing strongly, the **number of people working** compared to the population has dropped more than in other South Asian countries. This has brought back the discussion about jobless growth in India.

What is the employment rate?

The employment rate is a macroeconomic statistic measuring the percentage of the **working-age population employed**. In India, the current employment rate is 37 per cent.

What is Jobless Growth?

Jobless growth is when an **economy grows** (measured by GDP or other indicators), but this growth does not result in more job opportunities or **lower unemployment rates**.

Reasons for Jobless Growth in India

1. **Skill Mismatch**: There is a discrepancy between the skills demanded by industries and those possessed by the workforce. The education system often fails to equip students with the necessary skills for the job market, leading to unemployment or underemployment.

a. A study by the National Sample Survey Organization (NSSO) found that many graduates in India are unemployed or underemployed due to a lack of relevant skills.

2. **Rigid Labor Market**: India's labour laws are often rigid and complex, making it difficult for businesses to hire and fire workers. This discourages formal job creation and promotes informal employment.

   a. The World Bank's Ease of Doing Business report consistently ranks India low in terms of ease of hiring and firing workers due to stringent labour laws.

3. **Dominance of Informal Sector**: A significant portion of India's workforce is employed in the informal sector, which often lacks job security, social protection, and decent wages. Economic growth does not always translate into formal job creation, leading to jobless growth.

   a. According to the International Labour Organization (ILO), the informal sector in India accounts for a significant portion of employment, especially in agriculture, construction, and small-scale industries.

4. **Impact of Technology**: Technological advancements and automation can replace labour-intensive jobs, especially in manufacturing and agriculture, without creating equivalent new job opportunities.

   a. Case studies show job declines due to technologies like AI, ML, Robotics, and 3-D printing. There are also examples of job losses among urban women due to violence and travel time and among rural women due to agricultural mechanization.

5. **Slow Industrial Growth**: Industrial Development: India's industrial sector has not grown quickly enough to absorb the growing workforce, resulting in many people working in low-productivity sectors like agriculture.

6. **Population Pressure**: Job Market Pressure: India's large and growing population puts pressure on the job market. Despite economic growth, job creation cannot keep pace with the expanding labour force.

7. **Infrastructure Deficiencies**: Inadequate Infrastructure: Poor infrastructure, such as transportation, power, and logistics, hampers industrial growth and limits job creation opportunities.

   a. The manufacturing sector in India faces challenges like power shortages, poor transportation networks, and inefficient logistics.

8. **Policy Inefficiencies**: Inconsistent or ineffective government policies, regulatory hurdles, and bureaucratic red tape hinder job creation and economic growth.

   a. The implementation of the Goods and Services Tax (GST) faced initial challenges, including compliance issues and administrative complexities, affecting businesses, particularly SMEs, and impacting job creation in the informal sector.

9. **Rising Unemployment with Higher Education**: With higher education levels, the youth have rising aspirations and are not satisfied with low-quality jobs, seeking better opportunities.

   a. An IIM Lucknow study found that the unemployment rate for the illiterate and less educated (below primary) was 0.57% and 1.13%, respectively, while for highly educated individuals (graduates and above), it was 14.73% in 2020–21 for the age group 15–29 years.

How do we take growth and jobs together?

1. **Gender-Related Laws**: Legislation that promotes gender equality in workplaces, pay, and marriage increases women's labour supply and mobility. Studies (Braunmiller et al. 2023a, 2023b; Roy 2019) often use the World Bank's Women, Business, and the Law indices to measure these impacts (Hyland, Djankov, and Goldberg 2020).

2. **Efficient Land Markets**: Policies that improve land tenure security, document land rights, and transparently resolve land disputes enhance market efficiency. Success depends on local conditions, implementation quality, and community involvement (Deininger 2003; World Bank 2007).

3. **Openness to International Trade**: Streamlining border procedures, reducing trade barriers, improving logistics, and attracting foreign direct investment can boost trade openness (Ohnsorge and Quaglietti 2023; World Bank 2023b).

4. **Competitive Product Markets**: Simplifying labour and tax regulations, removing subsidies for state-owned firms, and promoting private sector dynamism enhance competition (World Bank 2020).

5. **Infrastructure Investment**: Investing in infrastructure reduces travel costs and times, facilitates market access, and enhances productivity, thereby boosting employment (Lakshmanan 2007, 2011).

6. **Improved Human Capital**: Enhancing skills enables easier employment transitions, especially from agriculture to non-agriculture sectors.

7. **Female Labor Force Participation and Exports**: Export-oriented sectors, driven by open trade policies, tend to promote gender equality and attract women into the workforce. Examples include Bangladesh's garment sector and India's business processing and outsourcing industry (Hoyos, Bussolo, and Núñez 2012; Jensen 2012). Similar trends are observed in Morocco, Tunisia, and Turkey (Klasen 2019).

India's economic growth is promising, but job creation remains a significant challenge. Addressing these issues requires a focus on mass education, industry-specific skill development, promoting labour-intensive manufacturing, and creating a safer environment for women in the workforce.

11. Oxford Economics' Global Cities Index 2024

1. In May 2024, A report from Oxford Economics evaluated cities worldwide on various factors like **economic output** and **quality of life**. Surprisingly, **no Indian city made it into the top 300**, with **Delhi ranking the highest at 350**.

About Global Cities Index 2024

1. **Assessment Categories:** Cities are assessed based on 27 indicators across five categories: **Economics** (30%), **Human Capital** (25%), **Quality of Life** (25%), **Environment** (10%), and **Governance** (10%).

2. **Regional Classification:** Cities are classified into regions like North America, Western Europe, Central America, Middle East and North Africa, South America, Sub-Saharan Africa, Eastern Europe and Central Asia, Southern Asia, East Asia, and Oceania.

3. **Evaluation Criteria**
   a. **Economics:** Measured by GDP size and employment opportunities.
   b. **Quality of Life:** Considers life expectancy and housing costs.
   c. **Human Capital:** Assesses education and skills.
   d. **Environment:** Looks at air quality and emissions intensity.
   e. **Governance:** Measures political stability and protection of residents' rights.

Key Findings

1. **Global Rankings:** The report ranks cities across 163 countries.
   a. **Top Cities: New York** topped the list, followed by **London** and **San Jose**.
   b. **Top Regions:** The top 10 cities are in North America, Western Europe, East Asia, and Oceania.
   c. **Economics Category:** New York ranked 1st, followed by Los Angeles and San Jose.
   d. **Human Capital:** London tops with the most globally ranked universities, followed by Tokyo and Riyadh.
   e. **Quality of Life:** Grenoble, France topped, followed by Canberra and Berne.
   f. **Environment:** Suva, Fortaleza, and San Juan are top performers.
   g. **Governance:** Auckland, Christchurch, and Wellington lead the category.

2. **India's Performance: New Delhi** ranked 51st in human capital, surpassing cities like Geneva and Canberra. Sultanpur in Uttar Pradesh scored poorly in multiple categories, ranking last overall.

    a. **Delhi vs. Mumbai:** Delhi outperformed Mumbai in various metrics, including Economics, Human Capital, and Quality of Life.

    b. **Environmental Performance:** Delhi ranked 973rd in Environment, surpassing only Sultanpur in Uttar Pradesh, which ranked 989th.

    c. **Governance:** All Indian cities ranked at 380th position in the Governance category.

    d. **Lowest Rank:** Sultanpur is the lowest-ranked Indian city, at the 1,000th spot.

    e. **Other Cities:** Other Indian cities include Kolkata (528th), Pune (534th), and Thrissur (550th).

Implications

1. **Global Impact:** The 1,000 largest cities contribute significantly to global GDP and population.

2. **Regional Disparities:** South Asian cities ranked lowest in most parameters, with North America leading in quality of life.

3. **Future Challenges:** Migration, housing crises, and healthcare infrastructure could affect rankings. Climate change poses additional threats, impacting multiple categories due to rising temperatures and natural disasters.

About Oxford Economics

1. **Leading Firm:** Oxford Economics is the world's foremost independent economic advisory firm.

2. **Global Presence:** Operates in over 200 countries with expertise across various sectors.

3. **Foundation:** Founded in Oxford, England in 1981, in collaboration with Oxford University's business college.

12. Dumping vs. Fair Trade: India's Response with Anti-Dumping Duties

Out of the 46 anti-dumping duties levied by the finance ministry in the last three years 60 per cent targeted goods originating only in China.

What Is Dumping?

Dumping is an international trade practice where a country exports a product at a price lower than its normal value in its domestic market. This can harm the domestic industry in the importing country by undercutting local businesses and distorting market competition.

India's Anti-Dumping Mechanism:

1. The Directorate General of Trade Remedies (DGTR) investigates dumping complaints brought forward by domestic industry players. If dumping and consequent injury to the domestic industry are found, the DGTR recommends an Anti-Dumping Duty (ADD).

2. The Central Board of Indirect Taxes and Customs (CBIC) then has three months to accept or reject the DGTR's recommendation. The imposition of ADDs is permitted under the World Trade Organization's (WTO) rules as a trade remedial measure.

Anti-dumping duty (ADD)	Countervailing Duties (CVDs)
1. It is a tax imposed on imported goods that are believed to be sold at a price lower than their fair market value in the exporting country.	1. CVDs are tariffs levied on imported goods to offset subsidies made to producers of these goods in the exporting country
2. This is **done to protect domestic businesses in the importing country** from what is considered unfair competition.	2. CVDs are meant to level the playing field between domestic producers of a product and foreign producers of the same product who can afford to sell it at a lower price because of the subsidy they receive from their government.

E. Science & Technology

1. Nanotechnology Revolutionizes Indian Farming: Zinc & Copper Boost

The Indian Farmers Fertiliser Cooperative Limited (IFFCO) has received approval for its **Nano Zinc and Nano Copper liquid fertilizers**, marking a significant step in the application of nanotechnology in Indian agriculture. These fertilizers are expected to enhance crop yields and address micronutrient deficiencies in plants.

Key points

1. **Zinc and Copper:** These micronutrients are essential for plant growth and development, playing crucial roles in enzyme functions, chlorophyll production, and seed production.

2. **Addressing Deficiencies:** The nanofertilizers aim to tackle zinc and copper deficiencies in agricultural soils, improving crop health and productivity.

3. **Nanotechnology in Agriculture:** This development highlights the growing use of nanotechnology to address challenges in agriculture, such as nutrient deficiencies, pest control, and crop protection.

4. **Previous Approvals:** IFFCO's nano-liquid urea and nano-liquid Di-Ammonia Phosphate (DAP) have also been approved, showcasing the company's commitment to nanotechnology-based solutions.

Benefits of Nano Fertilizers

1. **Enhanced Crop Production and Quality:** By ensuring optimal nutrient availability, nano fertilizers can lead to improved crop yields and better-quality produce.

2. **Reduced Micronutrient Malnutrition:** These fertilizers can help combat micronutrient malnutrition in crops, which can have adverse effects on human health.

3. **Efficient Nutrient Delivery:** Nanoparticles can deliver nutrients directly to plant cells, leading to higher absorption rates and reduced wastage.

Applications of Nanotechnology in Agriculture

1. **Nanofertilizers and Nanopesticides:** These nano formulations can enhance nutrient uptake and target pests more effectively, minimizing environmental impact.

2. **Nanobiosensors:** These sensors can provide real-time data on soil conditions and crop health, enabling farmers to make informed decisions.

3. **Soil Improvement:** Nanomaterials like clay nanoparticles and nanomagnets can improve soil structure and remove contaminants.

4. **Crop Protection:** Silica nanoparticles can protect plants from high temperatures and UV radiation.

5. **Crop Breeding:** Nanotechnology can aid in genetic modification for developing crops with desired traits.

6. **Food Processing:** Nanomaterials can enhance food packaging and preservation.

Potential Harmful Impacts of Nanoparticles (NPs)

1. **Nanophytotoxicity:** Accumulation of NPs at toxic levels in plants negatively impacts their growth and development.

2. **Human Health Hazards:** Consumption of nano-based food can lead to the accumulation of NPs in vital human organs.

3. **Oxidative Stress in Plants:** Certain NPs can cause high oxidative stress, disrupting cell metabolism in plants.

4. **Deleterious Effects on Soil Microbiota:** Exposure of non-target soil microflora to NPs disturbs their metabolism and stability.

5. **Contamination of Groundwater:** NPs accumulated in soil can interact with groundwater, making it unusable.

6. **Toxicity in Beehives:** Continuous exposure of beehives to NPs, carried by bees from plants, can cause toxicity.

Conclusion

Nanotechnology holds immense potential for transforming agriculture by addressing key challenges and improving crop productivity. However, it's crucial to develop regulatory frameworks to ensure the safe and responsible use of nanomaterials in agriculture, mitigating any potential risks to the environment and human health.

Government Initiatives

1. **Nano Mission:** Launched in 2007 to promote research and development in nanotechnology, including its applications in agriculture.
2. **Guidelines:** The Department of Biotechnology has developed guidelines for evaluating nano-agri inputs and products.
3. **National Agricultural Innovation Project (NAIP):** Several projects have been initiated to explore nanotechnology in agriculture.
4. **Skill development training programme on nanotechnology:** By Indian Council for Agriculture Research (ICAR), in line with the Government of India's Skill Development Initiative, to impart hands-on training on the synthesis & characterization of nanomaterials
5. **Nano Fertilizer Plant (NFP):** Established by IFFCO at Phulpur, Prayagraj

2. Xenotransplantation: Using Animal Organs to Save Humans

1. In May, 2024 the **1ˢᵗ recipient of a modified pig kidney transplant, Richard Slayman (62-year-old) passed away** around two months after the surgery was carried out.
2. **Earlier, In January 2022**, the first xenotransplantation of a genetically modified pig heart was done.
3. **However, the patient passed away after two months** due to a range of factors, including being tainted with a latent virus in the pig heart, which may have contributed to the dysfunction of the transplant.

What is Xenotransplantation?

Xenotransplantation is any procedure that involves the transplantation, implantation or infusion into a human recipient of either:

a. live cells, tissues, or organs from a nonhuman animal source
b. human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs.

In simple terms, it means taking an organ or tissue from an animal and putting it into a human. We've even tried pig hearts before, but things got complicated because of a hidden virus in the heart.
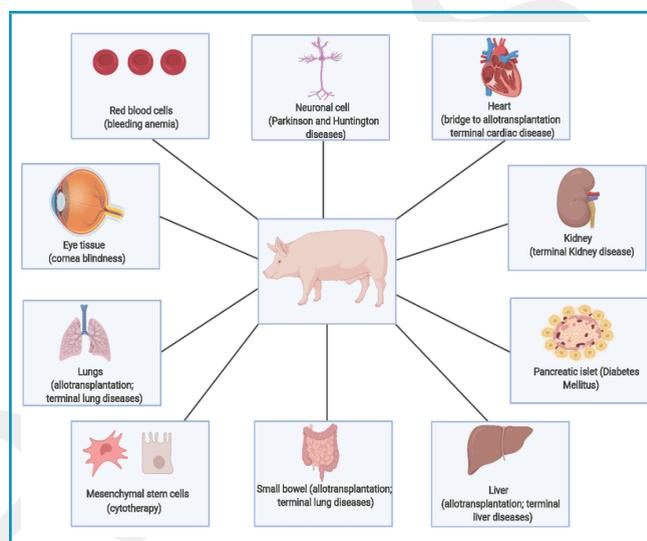
Why do we need it?

There aren't enough human organs for everyone who needs them. Xenotransplantation could give us an endless supply, saving countless lives.

Why pigs?

Pigs are the go-to choice because **their organs are similar in size** to ours and their genes can be tweaked to make their organs less likely to be rejected by our bodies. Plus, they reproduce quickly and live for a decent amount of time.

What are the challenges?

Our bodies tend to reject foreign organs, and there's always the risk of animal infections spreading to humans. It's also a pretty controversial idea, and some people have ethical concerns.

Xenotransplantation is still experimental, but it has the potential to revolutionize medicine.

Practice Question:

Q1. Xenotransplantation, sometimes in news, is best described by which of the following?

(a) Process of transplanting vital organs from deceased human donors.

(b) Technique for growing organs in a laboratory using stem cells.

(c) Process of transplanting live cells or organs from one species to another species.

(d) Process of developing a high-yielding genetically modified plant species.

Ans: (c)

Q2. 'Aerial metagenomics' best refers to which one of the following situations?

(a) Collecting DNA samples from air in a habitat at one go

(b) Understanding the genetic makeup of avian species of a habitat

(c) Using air-borne devices to collect blood samples from moving animals

(d) Sending drones to inaccessible areas to collect plant and animal samples from land surfaces and water bodies

Ans: (a)

3. Thrombosis with Thrombocytopenia Syndrome

The Oxford-AstraZeneca vaccine, marketed as Covishield in India by the Serum Institute of India (SII), has been linked to a rare but serious adverse side effect called **Thrombosis with Thrombocytopenia Syndrome (TTS)**.

What is Thrombosis with Thrombocytopenia Syndrome (TTS)?

TTS, also referred to as Vaccine-induced prothrombotic immune thrombocytopenia (VIPIT) or vaccine-induced immune thrombotic thrombocytopenia (VITT), is a condition characterized by the unusual combination of blood clots (thrombosis) and low platelet count (thrombocytopenia).

1. **Occurrence:** Primarily observed in individuals who have received COVID-19 vaccines using **Adenoviral Vectors** (like Covishield).

2. **Cause:** Believed to be triggered by an immune reaction to the Adenovirus Vector.

- Adenovirus Vectors, are commonly used in vaccine development due to their ability to induce strong immune responses.

3. **Symptoms**: Difficulty breathing, chest or limb pain, small red spots or bruising beyond the injection site, headaches, numbness.

4. **Mechanism:** TTS involves a complex interplay between the immune system and blood clotting mechanisms. The immune response to the Adenovirus Vector can lead to the activation of platelets, which are crucial for blood clotting. However, this activation also triggers the formation of abnormal blood clots, while simultaneously reducing the number of available platelets.

FLiRT- A New Variant of Covid-19

1. A new wave of COVID-19 infections has emerged due to the circulation of the KP.2 and KP1.1 variants, collectively known as the "FLiRT" variants.

2. These variants have been associated with increased cases and hospitalizations in the United States, United Kingdom, South Korea, and New Zealand.

3. India has detected 238 cases of KP.2 and 30 cases of KP1.1 as of May 6, 2024, indicating the presence of these variants in the country.

What are FLiRT Variants?

1. **Origin:** KP.2 and KP1.1 are descendants of the Omicron JN.1 variant, which spread globally in the winter of 2023.

2. **Dominance**: These variants appear to be more dominant than their ancestor and other Omicron variants, with KP.2 being the most dominant.

3. **Immune Evasion**: KP.2 is believed to be capable of evading immunity acquired through vaccination and prior infections.

4. **Mutations:** FLiRT variants originated from the JN.1 variant and carry two new spike mutations.

5. **Transmission:** FLiRT variants spread through respiratory droplets and contact with contaminated surfaces.

6. **Symptoms:** Similar to other Omicron sub-variants: Sore throat, Cough, Nausea, Congestion etc.

7. Prevention: Vaccination and adherence to preventive measures are crucial to curb the spread of these new variants.

8. **Additional Notes:** The situation is evolving, and it is important to stay updated with the latest information from health authorities.

How do different Covid-19 vaccines work?

Viral vector	RNA (nucleic acid)	'Whole' virus	Protein subunit
Uses a harmless virus which is altered to contain part of Covid-19's genetic code	Contains a synthetic version of part of Covid-19's genetic code (messenger RNA)	Contains a weakened or inactivated version of the Covid-19 virus	Uses pieces of the Covid-19 virus - sometimes fragments of the 'spike' protein

The code tells our cells to make the Covid-19 'spike' protein, which triggers an immune response

This triggers an immune response

Ferroptosis: A Newly Discovered Form of Cell Death

Recent research suggests that ferroptosis plays a role in the development of lung damage in COVID-19 patients.

• **Definition:** Ferroptosis is a distinct type of regulated cell death characterized by the buildup of toxic lipid peroxides on cell membranes.

• **Role of Iron:** Iron plays a crucial role in ferroptosis as it catalyzes the formation of these harmful lipid peroxides.

• **Mechanisms:** Ferroptosis is triggered by a decrease in intracellular glutathione and reduced activity of glutathione peroxidase, leading to lipid peroxidation and oxidative damage.

Implications of Ferroptosis in Diseases

• **Ferroptosis has been linked to various diseases, including,** Ischemia-reperfusion injury, Kidney injuries , Nervous system diseases, Cancer, Blood diseases

Other Key Concepts

• **Apoptosis:** Another form of programmed cell death, different from ferroptosis in terms of mechanisms and triggers.

• **Lipids:** Fatty compounds essential for various bodily functions but can be harmful in excess.

4. Bio-taxis: A New Way to Fight Cancer

1. Recently, the researchers at the **Indian Institute of Science (IISC)** have developed a new way to deliver cancer vaccines using the body's natural transport system.

2. They have **developed an antigen** that can **attach itself to a natural protein called serum albumin** in the blood and **travel to the nearest lymph node**, where the immune system is activated. This **method avoids the need for artificial carriers** that can cause side effects and allows for more targeted delivery of cancer vaccines.

Bio-taxis

1. Bio-taxis is like a **super precise way to deliver cancer drugs**. It's kind of like a **GPS for medicine**, using the body's natural pathways to get the drugs directly to the cancer cells.

2. The goal is to make cancer treatment more effective and with **fewer side effects** than traditional chemo. This is because it **focuses on just hitting the bad cells**, leaving the healthy ones alone

3. **One example of bio-taxis** for cancer treatment involves the **use of antibodies or nanoparticles** that are designed to **bind to specific molecules on the surface of cancer cells.** These targeted therapies can attach to/hitchhike on proteins in the bloodstream, such as serum albumin, until they reach their target. Once they reach the tumour, the **therapeutic agents can be released to kill the cancer cells.**

Cancer cells and their detection:

1. **Cancer Cells:** Cancer is a condition where **cells grow and divide uncontrollably** due to a disruption in their DNA.

2. **Immune System:** Normally, **our immune system fights against invaders using antibodies** produced in the **lymph nodes**, which are small organs in the human body. **Antigens** are molecules that **trigger the production of antibodies** to fight invaders (trigger immune response).

3. In the case of cancer, the cancer cells are clever (they evade the immune system) and can **shut down the production of antibodies** that target and eliminate them.

4. **Challenge:** To **develop a cancer vaccine**, scientists **modify or mimic an antigen** found on the surface of cancer cells to turn up or **turn on this antibody production.** These antigens can prod the immune system into producing antibodies. But **how to take the antigens to the lymph nodes?**
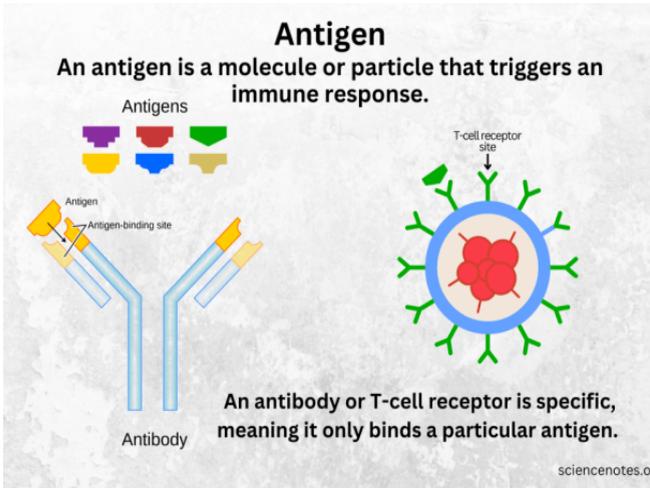
How to get antigens to lymph nodes?

1. **Old Way:** Scientists used to attach cancer antigens (stuff that triggers the immune system) to man-made carriers like viruses or proteins. But these carriers could be big, cause side effects, and sometimes even mess with how well the immune system worked.

2. **New Way:** The scientists figured out how to use the body's own delivery system. They made a special antigen that can stick to a protein called **serum albumin**, which is all over your blood. This antigen "hitchhiking "on the albumin, **going straight to the lymph nodes where the immune system activation happens.** This method is easier and avoids the problems of the old way.

   a. They made a **specific type of sugar called Tn** in the lab. This sugar is found on lots of different cancer cells.

   b. They mixed this sugar with a chemical that likes oils, making tiny bubbles called **micelles.** These bubbles really like to stick to human serum albumin.

   c. When a micelle grabs onto albumin, it breaks apart, and the antigen molecules inside stick to the albumin instead.

3. **What It Means:** This discovery means we might not need to look for viruses, proteins, or other carriers anymore. **Serum albumin itself can do the job** of carrying antigens! This is a big deal for making better cancer vaccines.

Carbohydrate-based antigens:

1. In recent years, scientists have been **focusing on carbohydrates** found on the surfaces of cancer cells to develop these antigens.

2. Both normal and cancer cells have carbohydrates on their surfaces, but cancer cells have heavily truncated (shortened) carbohydrates.

3. Hence, **Carbohydrate-based antigens** can play a crucial role in the development of cancer vaccines.

Practice Question:

Q. Consider the following statements:

Statement I: Human body's natural transport system can be utilised to deliver antigens to specific locations inside the body.

Statement II: Biotaxis is the method in which scientists utilise viruses or protein particles to deliver antigens to the lymph nodes.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

(b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

(c) Statement-I is correct but Statement-II is incorrect

(d) Statement-I is incorrect but Statement-II is correct

Ans: (c)

Q. With reference to recent developments regarding 'Recombinant Vector Vaccines', consider the following statements:

1. Genetic engineering is applied in the development of these vaccines.

2. Bacteria and viruses are used as vectors.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: (c)

5. DRDO's RudraM-II: The Next-Gen Anti-Radiation Missile

1. In May, 2024 The Defence Research and Development Organisation (DRDO) successfully conducted a flight test of the RudraM-II missile, an indigenously-developed air-to-surface missile system.

2. **It was launched from a Su-30 MK-I** platform of the **Indian Air Force (IAF) off the coast of Odisha**.

Key Points:

1. RudraM-II Missile:

  a. Indigenously developed by DRDO.

  b. Solid-propelled air-launched missile system, providing flexibility and rapid deployment.

  c. Designed for Air-to-Surface role.

  d. Range of approximately 350 kilometers.

  e. Neutralizes enemy assets (radar installations, communication centers, etc.).

2. RudraM Series Missiles (New-Generation Anti-Radiation Missiles - NGARMs):

  a. Designed to destroy enemy surveillance, communication, radars, and command and control centers.

  b. RudraM-I Missile (Range: 150 kilometers) was first tested in October 2020.

  c. This series enhance IAF's ability to suppress enemy air defenses **(SEAD missions)**.

3. What are Anti-Radiation Missiles (ARMs)?

  a. ARMs are designed to Detect, track, and neutralize enemy radar installations and communication assets.

  b. Navigation mechanism includes Inertial Navigation System (INS) and Passive Homing Head.

Conclusion

The successful flight test of RudraM-II missile is a significant milestone in India's indigenous missile development program. The missile enhances the Indian Air Force's strike capabilities and strengthens its air defense suppression capabilities. The RudraM series of missiles plays a crucial role in modern warfare by neutralizing enemy radar and communication assets, thereby enhancing the effectiveness of air strikes.

6. Agnikul Cosmos's Agnibaan SoRTed-01 mission

On May 30, 2024, Indian space startup Agnikul Cosmos launches first sub-orbital test vehicle, Agnibaan SOrTeD (Sub-Orbital Technology Demonstrator).

This launch marks the second by a private Indian startup and the first to utilize a private launchpad at Sriharikota.

Key Points:

1. **First in India:** Agnibaan SOrTeD is powered by the world's first single-piece 3D-printed semi-cryogenic rocket engine **(Agnilet)**.

2. **Second private launch:** This launch follows Skyroot Aerospace's Vikram-S launch in November 2022, making it the second by a private Indian space startup.

3. **Private launchpad:** The launch took place from Agnikul's dedicated private launchpad at Sriharikota, a pioneering move for a private company.

4. **Semi-cryogenic engine:** The rocket employs a semi-cryogenic engine, a technology utilizing sub-cooled oxygen as fuel.

Impact:

1. **Lower costs:** 3D printing technology has the potential to drastically reduce launch costs and assembly time.

2. **Affordable access to space:** Agnikul aims to provide cost-effective launch services for small satellites, expanding possibilities for research, communication, and various applications.

3. **Technological advancement:** The successful launch showcases India's growing expertise and innovation in the field of space technology.

Organizations Involved:

1. **Agnikul Cosmos:** An IIT Madras-incubated startup.

2. **Indian Space Research Organisation (ISRO)**

3. **IN-SPACe:** Indian National Space Promotion and Authorisation Centre

Features of Agnibaan SOrTeD:

1. **Agnilet engine:** Equipped with India's first indigenously developed semi-cryogenic engine.

2. **Kerosene-liquid oxygen propellant:** The engine efficiently burns kerosene-liquid oxygen.

3. **Dimensions:** Stands 18 meters tall with a diameter of 1.3 meters and a lift-off mass of 14,000 kg.

4. **Payload capacity:** Can carry a 100 kg payload up to an altitude of 700 km.

5. **Advanced technology:** Includes India's first Ethernet-based avionics architecture and in-house autopilot software.

6. **Versatile launch platform:** Designed for compatibility with multiple launch ports, utilizing the 'Dhanush' launch pedestal.

Significance of Agnibaan SOrTeD:

Agnibaan SOrTeD represents a major advancement in India's space program due to several factors:

1. **World's first:** The rocket boasts the world's first single-piece 3D-printed semi-cryogenic engine.

2. **Private launchpad:** Launched from India's first private launchpad, ALP-01, within ISRO's Sriharikota spaceport.

3. **Versatile access:** Can access both low and high inclination orbits, offering flexibility for various missions.

4. **Multiple launch ports:** Designed for launch from over 10 different launch ports, enhancing operational flexibility.

Agnikul Cosmos:

1. **Indian aerospace manufacturer:** Based at the National Centre for Combustion Research and Development (NCCRD) of IIT Madras in Chennai.

2. **Incorporation:** Formally incorporated as a company in 2017.

3. **Collaboration with ISRO:** Signed a framework agreement with the Department of Space in 2021 for access to ISRO facilities and expertise for the development of its Agnibaan launch vehicle.

7. JWST Spots Earliest-known Galaxy: JADES-GS-z14-0

1. NASA's James Webb Space Telescope (JWST) just found an incredibly old galaxy called **JADES-GS-z14-0.**

2. This galaxy, remarkably large and bright, formed when the universe was just 2% of its current age. Until now, the earliest-known galaxy dated to about 320 million years after the Big Bang, as announced by the JADES **(JWST Advanced Early Extragalactic Survey)** team last year.

Key facts about JADES-GS-z14-0:

The JADES-GS-z14-0 galaxy is one of the **oldest known galaxies**, existing just 290 million years after the Big Bang. This was during the "cosmic dawn," a period when the first galaxies were forming in an environment much denser and gas-rich than today.

1. **Size:** 1,700 light-years across (a light-year is 9.5 trillion km)

2. **Mass:** Equivalent to 500 million suns

3. **Star formation rate**: 20 new stars per year

4. This galaxy was discovered by the JWST Advanced Deep Extragalactic Survey (JADES) program. JADES-GS-z14-0 is smaller than modern galaxies like the Milky Way, but it provides valuable insights into how the universe's earliest galaxies formed and evolved.

5. The JADES program **also discovered the second-oldest known galaxy, JADES-GS-z14-1,** which existed 303 million years after the Big Bang. This galaxy is even smaller than JADES-GS-z14-0, but it still plays a crucial role in our understanding of the early universe.

The **JWST was launched on 25 December 2021** on an Ariane 5 rocket from Kourou, French Guiana. In **January 2022 it arrived at its destination**, a solar orbit near the Sun–Earth L2 Lagrange point, about 1.5 million kilometres (930,000 mi) from Earth. The telescope's first image was released to the public on 11 July 2022.

Q. Recently, scientists observed the merger of giant 'blackholes' billions of light-years away from the Earth. What is the significance of this observation? (PYQ 2019):

(a) 'Higgs boson particles' were detected.

(b) 'Gravitational waves' were detected.

(c) Possibility of intergalactic space travel through 'wormhole' was confirmed.

(d) It enabled the scientists to understand 'singularity'.

Ans: (b)

Q. What is 'JADES-GS-z14-0', recently seen in the news?

(a) Space observatory launched by Japan.

(b) Surface to Surface Missile developed by Russia.

(c) Rocket designed by ISRO, which is reusable.

(d) Earliest known galaxy discovered by James Webb Space Telescope.

Ans: (d)

8. NASA's Mission to Study Polar Regions: PREFIRE Polar Mission

In May, 2024 the National Aeronautics and Space Administration (NASA) launched one of the two climate satellites to **Study "Heat Emissions at Earth's Poles"** from New Zealand. The second satellite will be launched in the upcoming days.

About PREFIRE (Polar Radiant Energy in the Far-InfraRed Experiment) Mission:

1. **Mission name:** PREFIRE (Polar Radiant Energy in the Far-InfraRed Experiment)

2. **Purpose:**

   a. Reveal the full spectrum of **heat loss from Earth's polar regions** for the first time, improving the accuracy of climate models.

   b. Address gaps in knowledge and provide data to improve predictions of climate change and sea-level rise.

   c. Provide new information on how Earth's atmosphere and ice influence the amount of heat radiated out to space from the Arctic and Antarctic.

3. **Developer:** NASA and the University of Wisconsin-Madison (US).

4. **Satellites Type:** 6U CubeSat (They measure around 90 cm in height and nearly 120 cm in width when the solar panels (which will power the satellite) are deployed.

5. **Orbit:** The two satellites will be placed in a **near-polar orbit** (a type of low Earth orbit) at an altitude of about 525 kilometres.

6. **Equipment:** Each of the PREFIRE CubeSat is **equipped with a Thermal Infrared Spectrometer (TIRS)** — to **measure the amount of infrared and far-infrared radiation** from the Arctic and Antarctica.

Understanding Earth's Energy Budget

Imagine Earth like a giant thermometer. The sun shines on Earth, adding heat. At the same time, Earth releases some of this heat back into space. This balance of incoming and outgoing heat is called Earth's energy budget. If the budget is balanced, Earth's temperature stays stable. If it's not balanced, Earth gets warmer or cooler.

Why is Measuring Far-Infrared Radiation Important?

1. The Arctic and Antarctica, the coldest places on Earth, release a lot of heat as a special kind of invisible light called far-infrared radiation. Think of it like a heater you can't see!

2. Scientists haven't had a good way to measure this special heat before. That's like trying to understand the temperature in a room without a thermometer. This missing information creates a gap in our understanding of Earth's energy budget.

How Climate Satellites Will Help

Special tiny satellites **called CubeSats** are being sent to space to measure this missing heat. They'll focus on the Arctic and Antarctica and gather important data about:

   a. How much far-infrared heat is released: This will help us understand how much heat these cold regions are losing to space.

   b. How water vapor and clouds trap heat: This will help us understand how the greenhouse effect, which warms the Earth, works in these areas.

Why This Mission Matters

By measuring this special heat, scientists will have a better understanding of Earth's energy budget. This is important because it can help us:

   a. **Predict climate change:** Understanding the energy budget helps us make better predictions about how Earth's climate might change in the future.

   b. **Protect the environment:** This knowledge can help us find ways to protect the environment and keep Earth's temperature stable.

What are SmallSats?

SmallSats focus on spacecraft with a **mass less than 180 kilograms**.

It can be differentiated into a large variety of size and mass.

1. **Minisatellite,** 100-180 kilograms
2. **Microsatellite**, 10-100 kilograms
3. **Nanosatellite,** 1-10 kilograms
4. **Picosatellite**, 0.01-1 kilograms
5. **Femtosatellite,** 0.001-0.01 kilograms
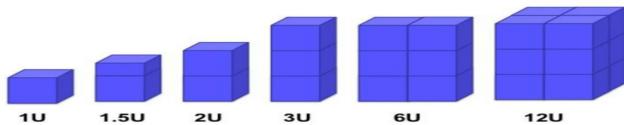
What are CubeSats?

1. CubeSats are are a class of nanosatellites whose basic design is a **10 cm x 10 cm x 10 cm** (which makes up for "one unit" or "1U") cube — just a little bigger than a Rubik's cube — and **weight not more than 1.33 kg**.
2. Depending on the CubeSat's mission, the number of units can be 1.5, 2, 3, 6, and 12U.
3. Owing to their **low cost and less mass** in comparison to traditional satellites, they are placed in orbits for **technology demonstrations, scientific research, and commercial purposes**.

Practice Question:

Q. Consider the following statements with reference to PREFIRE (Polar Radiant Energy in the Far-InfraRed Experiment) Mission:

1. The PREFIRE mission consists of two picosatellites to be deployed in the near-polar orbit.
2. The mission is a collaboration between NASA and ISRO.
3. It aims to determine the concentration of greenhouse gases around the Earth's poles.

How many of the statements given above are correct?

(a) Only one
(b) Only two
(c) All three
(d) None

Ans: (d)

Q. "The experiment will employ a trio of spacecraft flying in formation in the shape of an equilateral triangle that has sides one million kilometres

long, with lasers shining between the craft." The experiment in question refers to (UPSC 2020)

(a) Voyager-2
(b) New Horizons
(c) LISA Pathfinder
(d) Evolved LISA

Ans: (d)

9. Galaxeye Space sends SAR on High-Altitude Platform

Bengaluru-based space start-up, **Galaxeye Space** successfully tested a **Synthetic Aperture Radar** (SAR) developed by it on a **High-Altitude Platform station** (HAPS) of the National Aerospace Laboratories, based in Pune.

About Synthetic Aperture Radar

1. **SAR is like a super-powered camera that can see through clouds and even vegetation to capture detailed images of the ground. It's useful for various applications like tracking changes in the environment, disaster management, and defense.**
2. **HAPS are like big drones,** they can be moved, or made to hover over a certain country or a region.

High-altitude platform stations:

1. High-altitude platform stations (HAPS) are aircrafts that can fly at an **altitude of 18-20 km from the ground** (stratosphere), almost double the heights attained by commercial aeroplanes.
2. HAPs are of many **types:** Balloons, airships and unmanned aerial vehicles.
3. They are **typically solar-powered** so can remain in the air for months and even years, giving the advantage of a satellite.
4. They can carry **payloads of up to 40 kg.**

Differences between HAPS and Satellites:

1. **HAPS** are an emerging technology with the potential to complement terrestrial and satellite networks, offering a balance of coverage, latency, and cost-effectiveness.
2. **Satellites** remain essential for global communications, navigation, and wide-area applications where HAPS may not be suitable.

Features	HAPS	Satellites
Altitude	Operates in the stratosphere,	Varying orbits (Low Earth, Medium Earth, Geostationary)
Deployment & Maintenance	Easier to deploy, maintain, and upgrade due to lower altitude	Challenging and expensive to launch, maintain, and repair due to higher altitude
Latency	Lower latency (similar to terrestrial networks) due to proximity to Earth	Higher latency due to signal travel distance
Coverage	Smaller, localized coverage (suitable for urban or regional areas)	Wider coverage (global or regional)
Mobility	Can be maneuvered or relocated for dynamic coverage or disaster response	Fixed orbit or limited maneuverability
Cost	Generally cheaper than satellites due to no need for a rocket launch.	Launching and maintaining satellites in space is expensive.
Applications	Broadband internet, 5G/6G networks, remote sensing, surveillance, disaster management	Global communications, navigation (GPS), weather forecasting, Earth observation, scientific research Pen spark
Power Source	Solar power, fuel cells, or potential energy storage	Primarily solar power

Q. Consider the following statements with reference to High Altitude Platform Stations (HAPS):

1. HAPS are unmanned air vehicles that fly in the troposphere.
2. HAPS primarily are battery-powered and cannot remain in the air for longer duration.
3. The utility of HAPS is border surveillance and disaster response communication.

How many of the above statements are correct?

(a) Only one   (b) Only two
(c) All three   (d) None

Answer: (a) (Only statement 3 is correct)

10. Eta Aquarid Meteor Shower

Eta Aquarid meteor shower peaks during **early May each year**.

1. Meteors are space rocks that enter Earth's atmosphere burning and causing steak of light.
2. Meteors come from leftover comet particles and bits from broken asteroids.

About Eta Aquarid meteor shower

1. The Eta Aquarids meteor shower is an annual celestial event caused by Earth passing through the debris trail left behind by Halley's Comet.

2. These meteors are known for their speed, often leaving behind glowing trails as they burn up in Earth's atmosphere.
3. Southern Hemisphere is preferable for viewing Eta Aquarids as its radiant – **Aquarius Constellation** –is higher up in Sky in Southern Hemisphere.

11. Central Dogma and Gene Expression

1. Bacteria called Klebsiella pneumoniae can use an enzyme called reverse transcriptase to create new genes when infected with bacteriophages (viruses that attack bacteria).

2. This newly created gene produces a protein named Neo, which puts the bacteria in a dormant state, stalling the virus's replication and protecting the bacteria.

Central dogma of molecular biology:

1. Central dogma of molecular biology explains how genetic information flows from DNA to RNA to proteins.

2. Gene expression is the process our cells use to convert instructions in DNA into proteins. This happens in **two-stages called transcription** (occurs in the nucleus, in eukaryotic organisms) and translation (occurs in cytoplasm).

   a. **Transcription:** mRNA copies the sequence of a gene from DNA, and then leaves the nucleus and travels to cytoplasm.

   b. **Translation:** Using the template encoded by mRNA, translation is carried out by ribosomes, i.e., the information in the mRNA is used to synthesise proteins (building blocks of life).

3. **In prokaryotic cells** (such as bacteria), which lack a nucleus, transcription and translation occur in the same cellular compartment, the cytoplasm.

4. **In eukaryotic organisms,** transcription occurs in the nucleus, while translation occurs in the cytoplasm.

central dogma
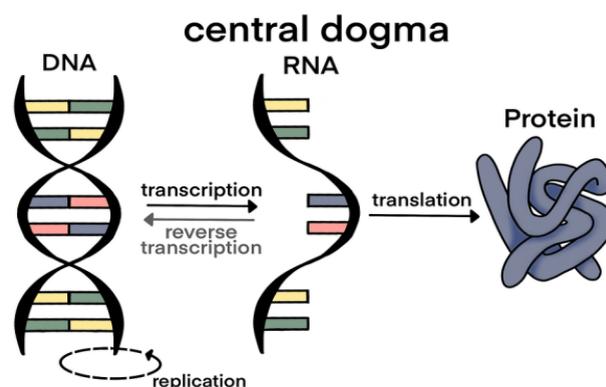
What's Happening	Transcription	Translation	Reverse Transcription
The Gist	Copying DNA into RNA	Using RNA to make a protein	Making DNA from RNA (like rewinding a cassette tape!)
Where it Goes Down	Nucleus of the cell	Cytoplasm of the cell	Can happen in the cytoplasm
The Big Picture	First step to make proteins	Second step to make proteins	Not involved in making proteins directly
Who's the Star	DNA	RNA (specifically, messenger RNA or mRNA)	RNA and a special enzyme called "reverse transcriptase"

Practice Question:

Q. Consider the following statements:

1. In eukaryotic organisms' transcription and translation occur in the cytoplasm.
2. The process of translation is carried out by ribosomes.
3. Reverse transcription is the flow of information from DNA to RNA.

How many of the statements given above are correct?

(a) Only one

(b) Only two

(c) All three

(d) None

Ans: (a) (Only statement 2 is correct)

Q. 'RNA interference (RNAi)' technology has gained popularity in the last few years. Why?

(1) It is used in developing gene silencing therapies.

(2) It can be used in developing therapies for the treatment of cancer.

(3) It can be used to develop hormone replacement therapies.

(4) It can be used to produce crop plants that are resistant to virtual pathogens.

Select the correct answer using the code given below.

(a) 1, 2 and 4

(b) 2 and 3

(c) 1 and 3

(d) 1 and 4 only

Ans. a)

12. WHO Prequalifies New Dengue Vaccine TAK-003

The World Health Organization (WHO) has prequalified a new dengue vaccine called TAK-003, developed by Takeda Pharmaceuticals.

This is the second dengue vaccine to receive WHO prequalification, following Sanofi Pasteur's CYD-TDV.

Key Points about TAK-003:

1. **Target Population:** Recommended for children aged 6-16 years in areas with high dengue burden and transmission intensity.

2. **Dosage:** Administered in a 2-dose schedule with a 3-month interval between doses.

3. **Vaccine Type:** Live-attenuated vaccine containing weakened versions of the four serotypes of the dengue virus.

4. **Significance:** This prequalification makes TAK-003 eligible for procurement by UN agencies like UNICEF and PAHO, expanding global access to dengue vaccines.

About WHO Vaccine prequalification

1. It was created in 1987 to assure the quality of vaccines distributed by UN purchasing agencies.

2. Vaccines showing positive outcomes after evaluation of relevant data, testing of samples and WHO inspection of relevant manufacturing sites are included in the list.

3. However, inclusion in the list does not imply approval of vaccines and manufacturing sites by the WHO.
   - Such approval is a prerogative of the National Regulatory Authorities.

4. Yet, pre-qualification is an important step in the expansion of global access to vaccines as it

5. enables procurement by UN agencies including UNICEF and PAHO (Pan American Health Organization).

6. Other vector-borne disease for which vaccines are included in this list include malaria, yellow fever, Japanese encephalitis, Rabies, etc.

13. AI agents: The Next Frontier in Artificial Intelligence

The recent launch of **GPT-4o by OpenAI and Project Astra by Google** has heralded a new era in Artificial Intelligence (AI) technology, marking a significant shift from text-based chatbots to more sophisticated, multimodal AI agents.

What are AI agents?

AI agents are **advanced AI systems** designed to interact with humans in real-time using multiple modes of communication, such as text, image, or voice. Unlike traditional language models that rely solely on text, AI agents can process and respond to a wider range of inputs, including voice commands, images, and even environmental data.

Key characteristics of AI agents:

1. **Multimodal interaction:** AI agents can communicate through various channels, making interactions more natural and immersive.

2. **Real-time responsiveness:** They are designed for instant, real-time conversations, providing a more human-like experience.

3. **Adaptability:** AI agents can quickly adapt to new situations and environments, making them incredibly versatile.

4. **Contextual awareness:** They can understand and learn from the context of interactions, allowing for more personalized and relevant responses.

5. **Autonomous task execution:** Beyond generating text, AI agents can perform complex tasks like coding, data analysis, and even physical actions when integrated with robotic systems.

Feature	AI Agents	Large Language Models (LLMs)
1. **Interaction Modes**	Multimodal (text, image, voice, environment)	Primarily text generation
2. **Real-time Response**	Yes	Limited
3. **Contextual Awareness**	Yes	Limited
4. **Task Execution**	Complex tasks, autonomous actions (with robotics)	Primarily text generation

Potential applications of AI agents:

1. **Customer service:** Providing personalized support, recommendations, and instant query resolution.
2. **Education:** Acting as personal tutors, adapting to individual learning styles, and offering tailored instruction.
3. **Healthcare:** Assisting medical professionals with real-time analysis, diagnostics, and patient monitoring**.**

Risk and Challenges	Solutions
1. **Privacy and security**	Implement robust data anonymization techniques, and enforce strict data security protocols.
2. **Misuse and Manipulation**	Clear ethical guidelines for development and use, strong regulations, and robust security measures to prevent unauthorized access and misuse.
3. **Job Displacement**	Focus on reskilling and upskilling the workforce to adapt to new job roles that complement AI capabilities.
4. **Over-reliance and Dependency**	Promote human oversight and control over AI systems, emphasize critical thinking and problem-solving skills, and ensure that humans remain the ultimate decision-makers.

Differences between AI, AGI, and AI Agents:

1. **AI:** The most common form of artificial intelligence today. It excels at specific tasks but lacks broader cognitive abilities.
2. **AGI:** A hypothetical level of AI that possesses human-like intelligence and can perform any intellectual task that a human can.
3. **AI Agents:** Entities that can perceive their environment and take actions to achieve specific goals. They are becoming more sophisticated and autonomous.

Features	Artificial Intelligence	Artificial General Intelligence (AGI)	AI Agents
1. **Scope**	Narrow, task-specific	Broad, human-level or beyond	Goal-oriented, multiple tasks
2. **Capabilities**	Learns and performs defined tasks	Reasons, plans, solves novel problems	Acts autonomously to achieve goals
3. **Adaptability**	Limited to training data	Adapts to new situations	Adapts based on feedback and environment
4. **Examples**	Image recognition, language translation	Hypothetical, not yet achieved	Chatbots, autonomous vehicles
5. **Current State**	Widely deployed	Active research area	Increasingly sophisticated
6. **Potential Impact**	Transforming various industries	Potential to revolutionize society	Enhancing productivity and decision-making
7. **Challenges**	Bias, explainability, safety	Technical hurdles, ethical concerns	Complexity, safety, alignment with human values

Q. Consider the following statements:

Q. 'AI Agents' are best described as which among the following?

(a) Large language models that can solely work on text-based inputs and outputs.

(b) A software program that can only respond to predefined commands.

(c) Sophisticated AI systems that can engage in real-time, multimodal interactions with humans.

(d) A large database that stores information for later retrieval.

Ans: (c)

14. Europe's AI Convention

1. In this background, **On May 17, 2024** the Council of Europe (COE) adopted the **Framework Convention on Artificial Intelligence and Human Rights, Democracy, and the Rule of Law, also known as the 'AI convention'.**

2. This convention is the first legally binding international instrument aimed at ensuring the ethical and responsible use of artificial intelligence (AI) while safeguarding human rights, democracy, and the rule of law.

Why is this convention important?

As of now, there are many tools, guidelines, and governance principles at national levels, but none of them are binding or acceptable at a global level. The AI Convention addresses this gap by establishing a common framework for the development and deployment of AI systems that upholds fundamental values and prevents potential harms.

What does the AI Convention cover?

The convention addresses a wide range of issues related to AI, including:

1. **Human Rights**: It mandates that AI systems be designed and used in ways that respect human rights, dignity, and fundamental freedoms.

2. **Democracy:** The convention seeks to prevent AI from being used to undermine democratic processes, manipulate public opinion, or discriminate against individuals or groups.

3. **Rule of Law:** It emphasizes the need for transparency, accountability, and fairness in AI systems to ensure they operate within legal and ethical boundaries.

4. **Risk Management:** The convention establishes a risk-based approach, requiring that AI systems be assessed for their potential impact on human rights and democratic values.

Key features of Framework Convention on Artificial Intelligence and Human Rights, Democracy, and the Rule of Law (AI Convention):

1. **General Obligations:** Parties to the convention are obliged to protect human rights and democratic processes in the context of AI**.**

2. **Fundamental Principles:** The convention enshrines principles such as respect for the rule of law, non-discrimination, and accountability in AI development and deployment.

3. **Risk Categorization:** The convention defines **4 risk categories for AI systems (minimal, limited, high, and unacceptable),** with corresponding obligations and restrictions.

4. **Oversight Mechanism:** It establishes a follow-up mechanism to monitor the implementation of the convention and promote cooperation among parties.

What Next?

The AI Convention is a significant milestone in the global effort to govern AI responsibly. However, its effectiveness will depend on its implementation and enforcement. Going forward, it will be crucial to:

a. **Encourage wider adoption:** Promote the convention globally to ensure broader protection of human rights and democratic values in the age of AI.

b. **Adapt and evolve**: As AI technology continues to advance, the convention may need to be updated to address emerging challenges and opportunities.

Conclusion

The Council of Europe's AI Convention marks a crucial step towards ensuring that AI serves humanity rather than harming it. By establishing clear guidelines and safeguards, it paves the way for a future where AI can be harnessed for good while minimizing its potential risks.

15. Nephrotic Syndrome

1. Recently, Kerala researchers reported multiple cases linking regular fairness cream usage to **Nephrotic syndrome.**

2. Nephrotic syndrome is a group of symptoms that indicate kidneys are not working properly. **These symptoms include**

a. too much protein in urine, **called proteinuria**

b. low levels of a protein called albumin in blood, called **hypoalbuminemia**

c. swelling in parts of body, called **edema**

d. high levels of cholesterol and other lipids (fats) in blood, called **hyperlipidemia**

• Study found a link between the increasing

use of fairness creams with high levels of mercury (beyond the safe limit of 1 ppm) and the development of membranous nephropathy.

e. Membranous nephropathy is an organ-specific autoimmune disease and a leading cause of nephrotic syndrome in adults.

3. Autoimmune disease is a condition in which the body's immune system mistakes its own healthy tissues as foreign and attacks them.

16. Virus-like particles (VLPs)

1. Scientists at the Institute of Advanced Virology (IAV), Thiruvananthapuram developed a **novel way of generating non-infectious Nipah Virus-Like Particles (VLPs)** in the laboratory.

2. These VLPs allow scientists to test vaccines and treatments for the Nipah virus in safer labs with lower safety requirements (BSL-2), making the research process safer and more accessible.

About Virus-Like Particles (VLPs):

Virus-Like Particle: No genome. Has at least some of the viral proteins.

Virion: Has genome and all viral proteins
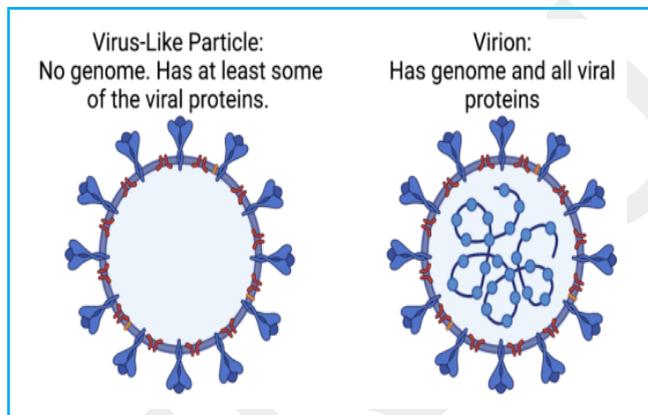
1. The VLPs are molecules that closely resemble viruses, but are non-infectious. They have long been recognised as effective quantitative platforms for studying viral binding and entry kinetics of the virus.

2. They are minute particles, typically ranging from 20 to 200 nanometers in radius, this small size allows them to navigate through the body and reach the lymph nodes efficiently, where they can activate the immune system.

Composition of VLPS:

They are **composed of one or more structural proteins**. These proteins can arrange themselves in layers, and some VLPs even have an outer lipid envelope that replicates the structure of a virus's protective shell.

Application of VLPS:

While current VLP vaccines effectively protect against several different diseases, including hepatitis B, human papillomavirus infection and malaria, the use of the VLP approach in other vaccines has been limited due to challenges with stability, difficulty in manufacturing, high production costs and sensitivity to temperature.

Benefits of VLPs:

1. VLP vaccines **can be produced using bacterial, yeast, insect, or mammalian cells.**

2. When introduced into the body, **they trigger an immune response** just like a real virus.

3. However, since VLPs lack genetic material, they cannot cause illness, this controlled exposure allows the body to develop immunity to the specific virus the VLP mimics due to their high-density display of epitopes and the capacity to present multiple proteins to the immune system.

4. It has been employed as nanomachines to deliver pharmaceutically active products to specific sites and into specific cells in the body.

About Nipha Virus (NiV):

1. Nipah Virus (NiV) is a severe and often fatal zoonotic disease,meaning it can be transmitted from animals to humans. It is a significant public health concern due to its high mortality rate and potential for outbreaks.

2. **Transmission:** It is a zoonotic disease that can be transmitted to humans through direct contact with infected animals, especially bats and pigs. Nipah virus infection can be transmitted through contaminated food or directly from person to person.

3. **Natural Reservoir**: Fruit Bats (also known as flying foxes) are believed to be the natural reservoir/primary carriers of the Nipah virus.

4. **Symptoms:**

a. The initial symptoms of NiV infection can be similar to those of influenza: Fever, muscle pain, and respiratory problems (similar to that of influenza).

b. Inflammation of the brain as well as late onset of Encephalitis can also occur.

c. The case fatality rate is between 65 percent and 100 percent.

5. **Treatment:** NiV is on the top-10 priority list of pathogens identified by the World Health Organization. Currently, there are no approved vaccines available against NiV.

17. West Nile fever

The Kerala government issued an alert in the State against West Nile fever, a mosquito-borne viral infection, after one death and eight cases were reported in recent days.

TRANSMISSION CYCLE OF WEST NILE VIRUS

Source: NIH/National Library of Medicine, US
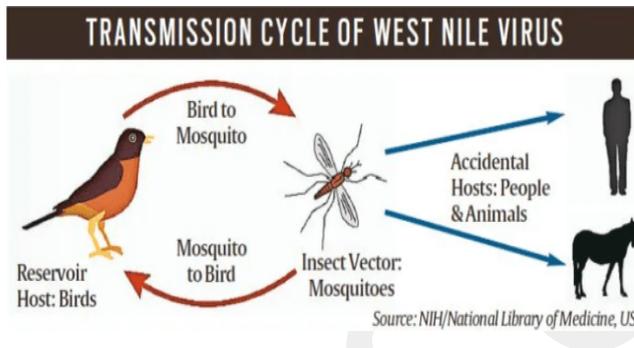
About West Nile Virus

1. West Nile virus belongs to the Flavivirus family.

2. It is a **flavivirus** associated to the viruses that are also responsible for causing St. Louis encephalitis, Japanese encephalitis, and yellow fever.

3. It's a simple virus made of a single strand of RNA.

4. Culex mosquitoes are responsible for spreading WNV.

5. It was first found in a woman in the West Nile district of Uganda in 1937. Later, it was discovered in birds in the Nile delta region in 1953.

6. Along all major bird migratory routes, WNV outbreak sites are found: **Africa, Europe, the Middle East, North America, and West Asia.**

7. Currently, there's no vaccine available for WNV.

Only supportive treatments can be provided to neuroinvasive WNV patients.

Transmission:

1. WNV are RNA viruses primarily transmitted by mosquitoes and ticks.

2. **West Nile Virus (WNV) is primarily spread by the bite of infected Culex mosquitoes.**

3. Birds are the main carriers of the virus, and infected mosquitoes transmit WNV between birds and other animals, including humans

4. **WNV can also get transmitted from an infected mother to her child through blood transfusion.**

   o A very small proportion of human infections have occurred through organ transplant, blood transfusions and breast milk. **There is one reported case of transplacental (mother-to-child) WNV transmission.**

5. No instance of transmission by contact with infected humans or animals has been reported.

6. It does not spread 'through eating infected animals, including birds.

7. According to the World Health Organization (WHO), **no human-to-human transmission of WNV through casual contact has been reported till date.**

Symptoms

1. **Severe Cases:** High fever, headache, confusion, coma, tremors, seizures, muscle weakness, and paralysis.

2. Most of the symptoms are similar to that of Japanese encephalitis.

3. However, most infected people (80%) have no symptoms.

4. **Rare Complications:** Severe infection may even cause neurological diseases like West Nile encephalitis or meningitis or West Nile poliomyelitis or acute flaccid paralysis.

5. There are reports of WNV-associated Guillain-Barré syndrome and radiculopathy.

6. **The *Flaviviridae* are a family of positive, single-**

stranded, enveloped RNA viruses.

7. They are found in **arthropods, (primarily ticks and mosquitoes), and can occasionally infect humans.**

8. **Some of the mosquitoes-transmitted viruses include**: Yellow Fever, Dengue Fever, Japanese encephalitis, West Nile viruses, and Zika virus.

9. Other *Flaviviruses* are transmitted by ticks and are responsible of encephalitis and haemorrhagic diseases: Kyasanur Forest Disease (KFD) and Alkhurma disease.

Practice Question for Prelims:

Q. Consider the following statements with reference to the West Nile Virus (WNV):

1. It is spread by the Culex species of mosquitoes.

2. The virus can get transmitted from an infected mother to the child.

3. The World Health Organisation has recently recommended the 'RTS,S' vaccine to prevent West Nile Fever.

How many of the statements given above is/are correct?

(a) Only one

(b) Only two

(c) All three

(d) None

Ans: (b)

Note: The World Health Organization (WHO) **recommended use of the RTS,S/AS01 (RTS,S) malaria vaccine among children in sub-Saharan Africa and in other regions with moderate to high *P. falciparum* malaria transmission.** The recommendation is based on results from an ongoing pilot programme in Ghana, Kenya and Malawi that has reached more than 900 000 children since 2019.

18. Brain-Eating Amoeba

A 15-year-old boy in Kerala's Alappuzha district has died of a rare infection caused by Naegleria fowleri, commonly known as the "brain-eating amoeba".

Key Points

LIFE CYCLE OF NAEGLERIA FOWLERI
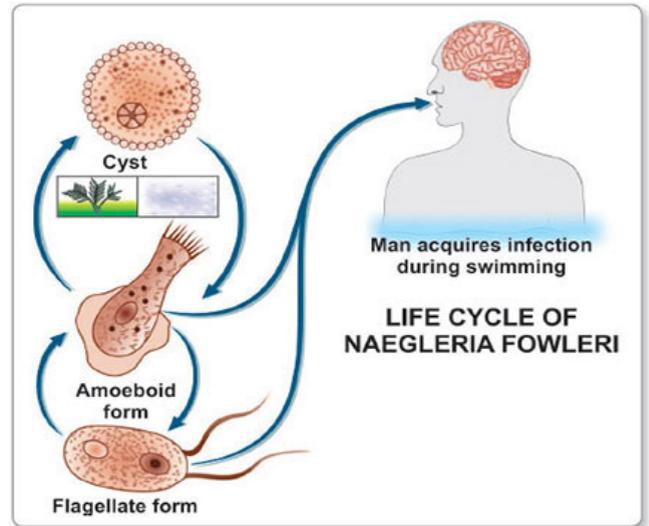
1. **What is Naegleria fowleri?:** A **single-celled (Unicellular)** organism found in warm freshwater environments like lakes, hot springs, and poorly maintained pools.

   • It survives on bacteria found in sediments in lakes and rivers. It does not survive in salt water and is therefore not found in marine water.

2. **How is it spread?** Enters through the nose and mouth during water activities like swimming, diving, or religious rituals. Travels to the brain via the olfactory nerve, causing inflammation and tissue destruction.

   • Infection **does not spread** from Person to Person (P2P).

3. **Symptoms (appear within a week):** Severe headache, fever, nausea, vomiting, stiff neck, confusion, seizures, and hallucinations.

4. **Prognosis**: Infection progresses rapidly, leading to coma and death. Chances of survival are low.

5. **Treatment:** Combination of medications, including miltefosine, which has shown efficacy in killing Naegleria fowleri. Survival rates are low, with mortality rates as high as 97%.

F. GEOGRAPHY & ENVIRONMENT

1. India Became Third Largest Solar Power Generator

1. India has surpassed Japan to become the **world's 3rd largest solar power generato**r in 2023, according to the Global Electricity Review (GER) 2024 by Ember, a global energy think tank.

2. This achievement highlights India's rapid growth in solar energy deployment and commitment to renewable energy sources.

Key finding of the report

GLOBAL

1. The **GER 2024** provides a comprehensive overview of the global power system in 2023 based on country-level data.

2. The **report covers 80 countries** representing 92% of global electricity demand, along with **historical data from 215 countries**.

3. Solar power maintained its status as the fastest-growing electricity source globally for the 19th consecutive year.

4. **Clean Electricity Growth Outpaces Demand:** Clean energy generation is projected to increase by 1300 TWh in 2024, surpassing the anticipated rise in electricity demand (968 TWh).
   - This growth is primarily driven by solar and wind energy expansion.
   - **India's solar capacity** additions were 74% higher in 2023 than in 2022, and wind additions were 47% higher.

5. **Fossil Fuel Generation Decline:** Global fossil fuel generation is expected to fall by 2% in 2024.
   - Half of the world's economies have already passed their peak in fossil fuel-based electricity generation.

6. **Emission Reduction:** The power sector is expected to witness a fall in emissions in 2024 due to the substantial growth in clean energy surpassing the increase in electricity demand.

7. **Electricity Demand Surge:** A significant increase in electricity demand is anticipated in 2024, driven by the rebound in OECD demand, the rise of electric vehicles, heat pumps, data centers, and **industrial growth in China and India.**
   - **India accounts** for the fastest rate of growth for demand of electricity through 2026 among major economies.

India-Specific findings

1. India's ranking has significantly improved from 9th place in 2015 to 3rd place in 2023.

2. India generated a record 5.8% of its electricity from solar power in 2023, surpassing Japan's solar contribution.

3. Renewables provided 30% of global electricity for the first time.

4. Solar was the main supplier of electricity growth in 2023.

5. India saw the **world's fourth-largest surge** in solar generation in 2023 behind China, the US and Brazil.

6. India produced the **second highest amount of electricity** from coal.

7. India's per capita emissions from the power sector are the fourth lowest in the G20, despite high coal reliance.

8. India's per capita emissions from the power sector are just over half the global average and even further below the average in Asia.

Challenges in the Power Sector and Potential Solutions

1. **Challenge 1: Drought and Reduced Hydropower**
   a. Invest in diverse energy sources (solar, wind, etc.) to reduce reliance on hydropower.
   b. Improve water management practices in reservoirs and implement drought-resistant crops in hydropower catchment areas.

2. **Challenge 2: India's electricity generation is more carbon-intensive than the global average.**
   a. Rapidly expand renewable energy capacity (solar, wind) through supportive policies and investment.
   b. Invest in carbon capture and storage (CCS) technologies for existing coal-fired plants.

3. **Despite progress, wind, solar and other low-carbon sources are not yet growing fast enough to meet India's rapidly growing electricity demand.**
   a. **Permitting Streamline:** Fast-track approvals for renewable projects.
   b. **Grid Modernization:** Upgrade the grid to handle more renewables.
   c. **Research & Development:** Continuously invest in research and development of new and improved renewable energy technologies and storage solutions. This will help to drive down costs, improve efficiency, and make renewables even more competitive with traditional fossil fuels.

Conclusion:

India's achievement of becoming the 3rd largest solar power generator is a policy to its commitment to sustainable development and clean energy transition. The country's progress in solar power generation is expected to continue as it strives to achieve its renewable energy targets and contribute to global efforts to mitigate climate change.

2. Marine Heat Waves

Scientists at the ICAR-Central Marine Fisheries Research Institute (CMFRI) have recorded an alarming situation of severe **coral bleaching in the Lakshadweep Sea** owing to marine heat waves.

About Marine Heat Waves

Marine heat waves (MHW): are extreme rises in ocean temperature that occur over an extended period of time. These events can happen at different locations in the ocean and have become more frequent and intense over the last few decades.

1. **Definition:** MHWs are sharp spikes of anomalously warm temperature **that last at least five days, although many persist for weeks or even months.** During an MHW, the average temperatures of the ocean surface (up to a depth of 300 feet) goes 5-7 degree C above normal.
   a. **Around 90%** of the warming caused by greenhouse gas emissions is absorbed by the oceans.

2. **Causes:** They are fuelled by climate change-induced ocean warming, but other factors can contribute as well.
   a. These include natural variability, shorter-term weather phenomena (such as fronts), intrapersonal events (30- to 90-day cycles), annual variations, and decadal changes.

3. **Impacts:**
   a. **Ecosystems:** MHWs can have harmful effects on marine ecosystems. For instance, coral reefs may experience bleaching due to prolonged exposure to high temperatures. Seagrass beds and kelp forests can also be affected.
   b. **Marine Industries:** Fisheries and aquaculture can suffer due to changes in fish distribution and productivity caused by MHWs.
   c. **Human Activities:** Coastal communities and economies can be impacted by disruptions in fishing, tourism, and other ocean-related activities.
   d. **Long-Term Effects:** Even after the water cools down, the impacts of MHWs can persist for years, affecting marine ecosystems and biodiversity.

Recent Incidence: Lakshadweep Sea

1. Scientists at ICAR-CMFRI recorded severe coral bleaching due to MHW.
2. Prolonged period of MHW since late October 2023.
3. Degree Heating Week (DHW) indicator surged above 4°C-weeks, posing substantial risk of coral bleaching.
4. Heat stress threatens coral survival and overall marine biodiversity.
5. Sea-grass meadows also impacted, affecting local marine food webs.
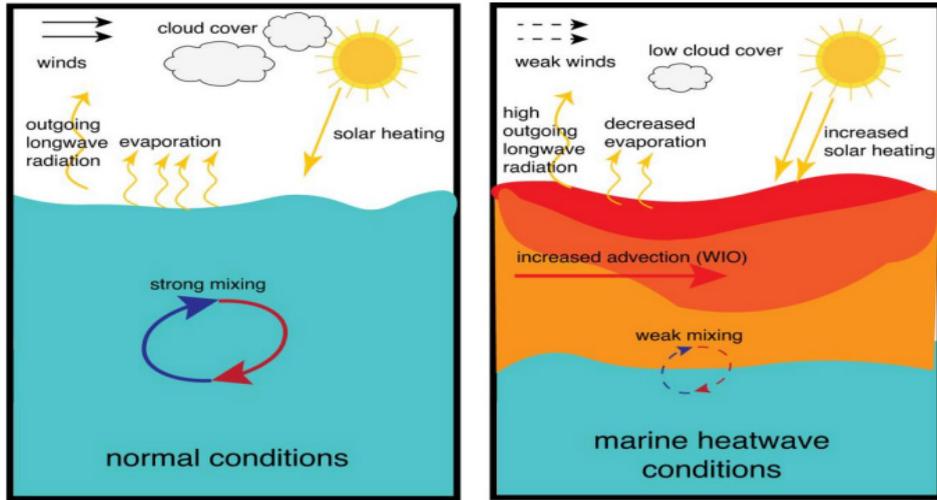
Challenges	Solutions
1. Coral Bleaching due to prolonged MHWs	2. Develop and implement coral reef restoration projects. 3. Invest in research to understand coral resilience and identify heat-resistant strains.
2. Impacts on Seagrass Meadows and Marine Food Webs	1. Implement conservation measures to protect seagrass habitats. 3. Research the impacts of MHWs on seagrass to develop adaptive management strategies.
3. Disruption of Fisheries and Aquaculture Industries	1. Develop early warning systems for MHWs to allow for timely response and adaptation in fishing practices. 3. Diversify aquaculture species to reduce vulnerability to MHWs.

Incidences of Marine Heat Waves
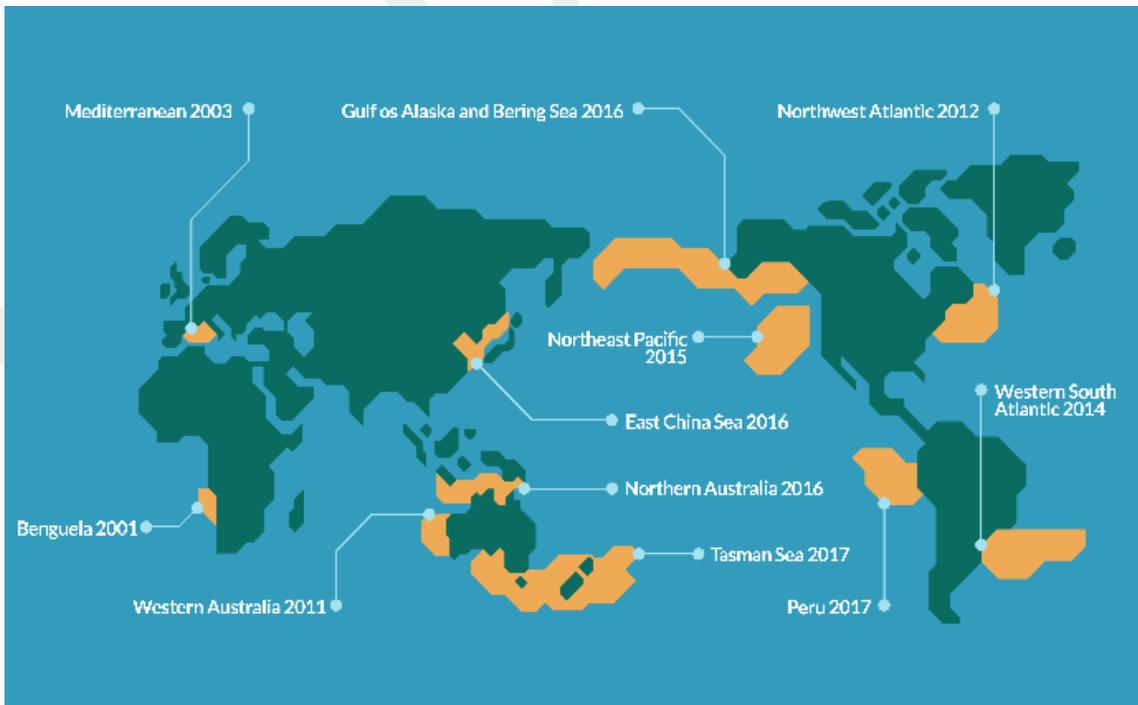
3. Understanding Urban Heat Islands

According to **Carbon Brief**, nearly 40% of the Earth's surface experienced its **highest-ever daily temperature** between 2013 and 2023. This increases the instances of Urban Heat Island.

What is Urban Heat Island?

1. An urban heat island occurs when a **city experiences** significantly **warmer temperatures** than nearby rural areas.

2. This temperature difference arises from the varying abilities of urban and rural surfaces to absorb and retain heat.

Instances of Rising Temperatures

Rising temperatures are becoming increasingly concerning worldwide. In recent years, we've witnessed record-breaking temperatures in various locations: the United Kingdom exceeded 40°C for the first time in July 2022, a town in northwest China reached a national high of 52°C last year, and Sicily, Italy, experienced Europe's hottest temperature on record at 48.8°C in 2021. While there have been reports of 52.9°C in New Delhi, these are under verification due to inconsistencies with other local measurements.

Reasons for Rising Temperatures

Feature	Rural Areas	Urban Areas
1. **Surface Cover**	Plants, grasses, trees, farmland	Buildings, roads, concrete, asphalt
2. **Heat Absorption**	**Lower:** Plant surfaces reflect more solar radiation and absorb less heat.	**Higher:** Building materials absorb and store more solar radiation, leading to increased heat.
3. **Heat Retention**	**Lower:** Transpiration from plants releases water vapor, cooling the environment. Open spaces allow for better air circulation.	**Higher:** Stored heat in building materials is released slowly, resulting in warmer temperatures day and night. Reduced air circulation.
4. **Cooling Mechanism**	Transpiration (plant sweating), evaporation of water from soil, and wind flow.	Limited cooling mechanisms. Heat is dissipated mainly through radiation and some convection.

Urban Heat Islands - Causes, Impacts, and Mitigation

Factor	Causes	Impacts	Mitigation
1. **Urban Structure**	Urbanization, tall buildings, removal of vegetation	Heat absorption, reduced evaporative cooling	Increased vegetation cover, green roofs, tree planting, sustainable building design
2. **Human Activities**	Transportation, industrial processes, energy consumption	Heat release	Pedestrian-friendly urban spaces, green areas, sustainable building practices
3. **Surface Properties**	Low albedo surfaces (concrete, asphalt)	Increased solar radiation absorption	Reflective roofing materials, heat-absorbing coatings on pavements
4. **Green Spaces**	Reduction of parks and gardens	Decreased cooling effect of vegetation	Urban forestry programs, increased green spaces

4. Clean Energy Transition

1. World Economic Forum released "Fostering Effective Energy Transition 2024" report.
2. Report is based on the Energy Transition Index (ETI) that evaluates 120 countries on their energy system performance and readiness for secure, sustainable, and inclusive energy systems.
3. ETI 2024 framework offers a comprehensive assessment of countries' energy systems with a consistent methodology, allowing decisionmakers to compare and track progress.

Key Findings

1. **India's rank**: 63rd (up from 67 in 2023)
2. **Clean energy infrastructure investments**: Reached $1.8 trillion in 2023, with nearly 90% of the growth since 2021 occurring in advanced economies and China.
3. **Top 5 performers**: Sweden, Denmark, Finland, Switzerland and France.
4. **Six G20 countries are among the top 20 performers**: France, Germany, Brazil, China, the UK, and the USA.
5. **Net-zero Achievers**: 8 countries (Bhutan, Comoros, Gabon, Guyana, Madagascar, Niue, Panama, and Suriname)

Energy Transition

1. **Definition:** Shifting energy production from high-emission sources like fossil fuels to low/no-emission sources.
2. **Significance for India**: Energy security; Job Creation; Achieve climate target like to reach net zero emissions by 2070; etc. India's Status of Clean Energy Transition

India's Clean Energy Status:

1. **Global Rank:** India stands 4th globally in Renewable Energy Installed Capacity, 4th in Wind Power capacity and 5th in Solar Power capacity
2. **Installed RE Capacity**: Increased from 76.37 GW in 2014 to 193.58 GW (including hydro) in May 2024.
3. **RE targets in India**
   a. India aims reaching a non-fossil fuel energy capacity of 500 GW by 2030 and
   b. Fulfilling at least half of its energy requirements via RE by 2030.

India Renewable Energy Mix (May 2024)
Solar 57%
Wind 32%
Small Hydro Power 3%
Waste to Energy 1%
Biomass cogeneration 7%
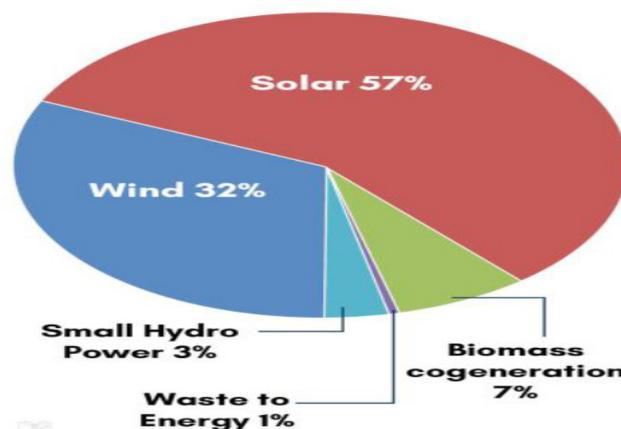
Challenges:

1. **Technological Barriers:** Advanced clean energy technologies are not yet fully developed or widely deployed.
2. **Investment Disparities:** Insufficient investment in developing nations, with most clean energy investment concentrated in advanced economies and China.
3. **Uncertainties in Subsidies and Supply Chains:** High interest rates and cost increases deter investment in clean energy projects.
4. **Geopolitical Tensions and Trade Protectionism:** These factors create barriers to the energy transition, especially for developing countries.
5. **Energy Storage Limitations:** Lack of effective and affordable energy storage solutions for renewable energy sources.
6. **Financial and Economic Barriers:** High upfront costs of clean energy projects hinder their adoption.

Way Forward:

1. **Bridge the Investment Gap:** Increased financial support from advanced economies and mobilization of domestic capital in developing nations.
2. **Implement Decarbonization Regulations:** Strong political commitment and consistent policies to drive decarbonization.
3. **Deliver Energy Equity:** Social safety nets and compensatory measures to protect vulnerable households during the transition.

4. **Drive R&D and Technology Adoption:** Accelerate research and development of new energy technologies and promote their adoption.

5. **Make Renewable Energy a Global Public Good:** Remove barriers to knowledge sharing and technology transfer, including intellectual property rights.

6. **Level the Playing Field for RE Technologies:** Reform domestic policies to streamline renewable energy projects and encourage private investment.

Initiatives to Facilitate Energy Transition

	Initiative	Lead/Key Players	Focus
Global			
1.	International Solar Alliance (ISA)	India, France (Founding Members)	Solar energy deployment and access
2.	Clean Energy Transitions Programme	International Energy Agency (IEA)	Comprehensive clean energy transformation
3.	Panel on Critical Minerals	Governments, organizations, UN bodies (incl. India)	Responsible management of energy transition minerals
4.	Just Energy Transition Partnerships (JETP)	IEA, World Economic Forum	Supporting developing countries' clean energy transitions
5.	Carbon Border Adjustment Mechanism (CBAM)	European Union	Leveling the playing field for carbon-intensive products
6.	Global Renewables Pledge	133 countries	Tripling renewables capacity by 2030
India			
1.	National Solar Mission	Government of India	Establish India as a global solar leader
2.	National Electric Mobility Mission Plan	Government of India	Promote electric and hybrid vehicle adoption
3.	Green Energy Corridor Project	Government of India, World Bank	Nationwide transmission network for renewable energy
4.	National Biofuel Policy	Government of India	Promote biofuel use as fossil fuel substitute
5.	Renewable Purchase Obligation (RPO)	Government of India	Mandate renewable energy purchase by utilities
6.	National Green Hydrogen Mission	Government of India	Make India a global green hydrogen hub

5. Cyclone Remal

1. Recently, Cyclone Remal originated in the **Bay of Bengal** and made landfall over the coasts of West Bengal over which 1 lakh people were evacuated from coastal regions in Bengal to secure shelters.

2. Cyclone Remal was the **1st storm in the Bay of Bengal** during the pre-monsoon season.

3. It is a tropical cyclone, currently **impacting the Bay of Bengal.**

4. The name **"Remal," meaning 'sand' in Arabic, was chosen by Oman** and assigned according to the standard convention for naming tropical cyclones in the region.

Understanding Cyclones and Their Types

A **"Cyclonic Storm"** or **"Cyclone"** is an intense vortex or cycle in the atmosphere with very strong winds rotating counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. Cyclones are often accompanied by violent storms and adverse weather conditions.

Coined from the Greek word "Cyclos" by Henry Peddington, cyclones are associated with violent storms, heavy rainfall, and strong winds.

Types of Cyclones

The National Disaster Management Authority (NDMA) categorizes cyclones into 2 types:

1. Tropical Cyclones

2. Extratropical Cyclones (Mid-latitude Cyclones)

1. Tropical Cyclones:

I. Form over warm tropical or subtropical waters.

II. Derive energy from the evaporation of water from the ocean surface. (A tropical cyclone starts to weaken when it loses its source of warm, moist air, typically after making landfall or moving over cooler ocean waters.)

III. Have different names based on location:(Worldwide Terminology of Tropical Cyclones)

  a. Hurricanes (Atlantic and eastern Pacific Oceans)

  b. Typhoons (western Pacific Ocean)

  c. Willy-willies (Australian region)

  d. Cyclones (North Indian Ocean)
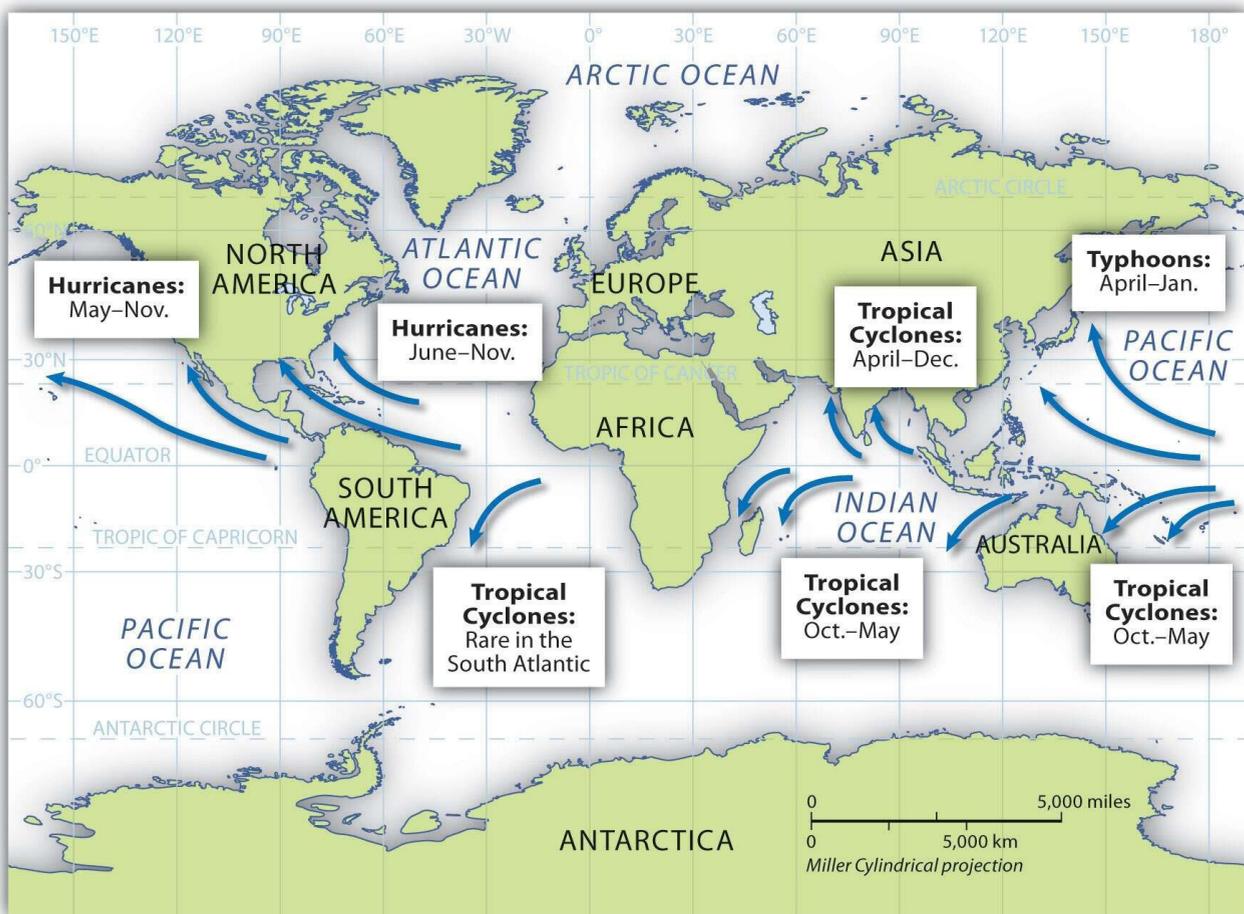
Fig: Distribution of cyclones in tropical regions.

Naming of Tropical Cyclones

1. The naming of tropical cyclones is a relatively new practice **coordinated by the World Meteorological Organization (WMO).**

2. In the **Indian Ocean region**, a naming formula was established in 2004 involving **eight countries**: Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka, and Thailand.

3. **Each country contributes a list of names**, which are used sequentially whenever a cyclonic storm forms.

- **Examples** of named cyclones in this region include **Hudhud, Titli, Phethai, Fani, Vayu, and Amphan**.

2. **Extratropical Cyclones (Mid-latitude Cyclones):**
   I. Occur outside tropical regions (beyond the Tropics of Cancer and Capricorn).
   II. Have cold air at their core.
   III. Derive energy from the interaction of cold and warm air masses.
   IV. Always have one or more fronts (boundaries between different air masses).
   V. Can occur over both land and ocean.

Key Differences Between Tropical and Extratropical Cyclones

Feature	Tropical Cyclones	Extratropical Cyclones
Formation Location	Warm tropical/subtropical waters	Outside tropical regions
Energy Source	Evaporation of water from the ocean surface	Interaction of cold and warm air masses
Core Temperature	Warm	Cold
Fronts	Not associated with fronts	Always have one or more fronts
Naming	Vary based on location (hurricanes, typhoons)	Generally, not named by specific conventions

Fronts

1. When **2 different air masses** with distinct properties meet, the boundary zone between them is called a front.
   - **An air mass is a large body** of air with consistent temperature and humidity. It forms when air stays over a uniform area (like an ocean or plain) for a long time, taking on the characteristics of that area. These characteristics remain stable as long as the air mass stays over the same type of surface. Air masses are important for weather and climate.
2. There are **4 main types** of fronts:
   a. **Stationary Front**: When neither air mass displaces the other, it's called a stationary front. Weather conditions along a stationary front can remain unchanged for several days.
   b. **Cold Front**: When colder, denser air moves towards warmer air, it forms a cold front. Cold fronts typically bring abrupt changes in weather, including intense precipitation and thunderstorms.
   c. **Warm Front**: When warmer air advances over cooler air, it creates a warm front. Warm fronts bring more gradual weather changes, characterized by prolonged periods of light to moderate precipitation.
   d. **Occluded Front**: When a cold front overtakes a warm front, lifting the warm air mass off the ground, it forms an occluded front. Occluded fronts often bring a mix of weather conditions, including precipitation and sometimes thunderstorms.

Cyclones in India

Tropical cyclones originating over the Bay of Bengal, Arabian Sea, and Indian Ocean bring destructive elements to the Indian coastal states of Tamil Nadu, Andhra Pradesh, West Bengal, Odisha, and Gujarat, which are more vulnerable to cyclone disasters. These cyclones are characterized by:

1. **Strong Winds/Squalls**: High wind velocities damage infrastructure, homes, communication systems, and trees, resulting in significant loss of life and property.
2. **Torrential Rains and Inland Flooding**: Heavy rainfall over wide areas causes severe problems for people left homeless by cyclones. It leads to extensive soil erosion, weakens embankments, and contributes to widespread flooding.
3. **Storm Surge**: A severe tropical cyclone causes an abnormal rise in sea level near the coast, known as storm surge. This inundates low-lying coastal areas, submerging human settlements, and livestock, eroding beaches, destroying vegetation, and reducing soil fertility.

Bay of Bengal vs. Arabian Sea: A Tale of Two Cyclone Hotspots

Both the Bay of Bengal and the Arabian Sea are facing increased cyclone risks, driven by a combination of geographic, meteorological, and human factors. While the Bay of Bengal has historically been more prone to cyclones due to its unique geography, the Arabian Sea is experiencing a concerning rise in cyclone activity, largely attributed to the impacts of climate change. This shift highlights the importance of understanding and adapting to the evolving nature of cyclone risks in both regions to protect vulnerable coastal communities and infrastructure.

Features	Bay of Bengal	Arabian Sea
1. **Cyclone Frequency**	Historically more prone to frequent cyclones	Historically fewer cyclones, but experiencing an increase in recent decades
2. **Geographic Factors**	Shallow northern part and landlocked nature intensify storm surges; low-lying islands with numerous rivers exacerbate flooding and erosion	Rising sea surface temperatures (1.2°C to 1.4°C increase) create favorable conditions for cyclone formation and intensification
3. **Meteorological Factors**	Complex coastal geometry leads to diverse cyclone impacts depending on local geography	Indian Ocean Dipole (IOD) positive phase causes warmer sea surface temperatures and increased precipitation in the western Indian Ocean region, contributing to cyclone development
4. **Human Factors**	Increased population concentration in vulnerable coastal areas due to infrastructure development heightens exposure and vulnerability	Densely populated coastal regions along the western coast of India (Thiruvananthapuram to Gujarat) face growing threats from increasingly intense cyclones with higher wind, storm surges, and severe rainfall
5. Key Concerns	Storm surges, flooding, erosion, and impact on vulnerable coastal communities	Increasing cyclone intensity, heightened risk of wind damage, storm surges, severe rainfall, and threats to densely populated coastal areas

Prelims:

In the South Atlantic and South-Eastern Pacific regions in tropical latitudes, cyclones do not originate. What is the reason? (UPSC CSE 2015)

(a) Sea surface temperatures are low

(b) Inter-Tropical Convergence Zone seldom occurs

(c) Coriolis force is too weak

(d) Absence of land in those regions

Ans. (b)

6. Constructed Wetlands

Recently, there has been a shift towards constructed wetlands **for industrial wastewater treatment**. Unlike traditional methods, constructed wetlands **use natural processes** involving vegetation and soil to effectively treat diverse pollutants, offering better performance and additional environmental benefits.

What are Constructed Wetlands?

1. Constructed wetlands are **man-made systems** that work like natural wetlands to clean wastewater.
2. They use plants, soil, and water to **remove pollutants**.
3. These systems help **good bacteria and plants grow**, which break down harmful substances and improve water quality.

What are the types of Constructed Wetlands?

1. **Subsurface Flow** (SSF): In SSF wetlands, wastewater flows **through gravel beds** or porous materials, where microbes break down organic matter.
2. **Surface Flow** (SF): In SF wetlands, water flows **above the surface**, creating attractive landscapes with various plants.

Need of Constructed Wetlands

1. Traditional wastewater treatment methods, like physical and chemical treatments, often struggle with the complex pollutants in industrial wastewater.
2. These methods can be costly, energy-intensive, and may not fully remove all contaminants, highlighting the need for more **comprehensive and sustainable solutions** like constructed wetlands.

Environmental Benefits of Constructed Wetlands

1. Constructed wetlands serve as **habitats for various plant and animal species**, contributing to biodiversity conservation.
2. They provide ecosystem services such as **flood control** and **carbon sequestration**, enhancing their ecological value.
3. They also offer a sustainable solution for **water treatment**, requiring minimal energy and utilizing natural processes for purification.

Cost-Effective of Constructed Wetlands

1. Compared to traditional wastewater treatment plants, constructed wetlands are **less expensive** to build, operate, and maintain.
2. They efficiently **remove pollutants** like nitrogen, phosphorus, and organic matter, and can be used to reclaim land degraded by activities such as mining, and restoring natural wetland functions.

Applications of Constructed Wetlands

1. Constructed wetlands can serve as **secondary or tertiary treatment stages**, enhancing water quality before discharge or reuse.
2. These systems effectively **filter stormwater runoff**, removing pollutants and sediments before they enter natural waterways.
3. Constructed wetlands **can be customized** to treat specific types of industrial wastewater, depending on the contaminants.
4. They are useful in **treating agricultural runoff**, reducing pollution, and improving water quality for irrigation.

Constructed Wetlands in India

1. The **Asola Bhatti Wildlife Sanctuary** in Delhi uses constructed wetlands to purify sewage from nearby settlements while providing a habitat for flora and fauna.
2. Similarly, the **Kolkata East Wetlands** in West Bengal treat wastewater from Kolkata, supporting local fishing and agriculture.
3. In Rajasthan, the **Sariska Tiger Reserve** has implemented constructed wetlands to treat wastewater from nearby villages.

Aspect		Natural Wetlands	Constructed Wetlands
1.	**Definition**	Ecosystems occurring naturally in the environment, are characterized by water, and supporting aquatic plants and wildlife.	Man-made systems designed to mimic natural wetlands for water treatment purposes.
2.	**Formation**	Form naturally in low-lying areas due to factors like rainfall, groundwater, or proximity to rivers/lakes.	Engineered and built by humans to treat wastewater, stormwater, or industrial water.
3.	**Biodiversity**	Rich in biodiversity, providing habitat for diverse plant and animal species, including endangered species.	Supports selected plant species and microorganisms that aid in water purification.

4.	Ecosystem Services	Provides natural services like water purification, flood control, carbon sequestration, and support for fisheries and agriculture.	Designed to perform specific functions such as wastewater treatment, stormwater management, and pollutant removal.
5.	Types	Includes marshes, swamps, bogs, fens, etc.	Includes subsurface flow (SSF) and surface flow (SF) wetlands, each with different water flow mechanisms.
6.	Purpose	Natural ecological balance and support system for wildlife.	Treatment of wastewater, stormwater, and agricultural runoff while mimicking natural processes.

What are the Challenges associated with the Constructed Wetlands?

1. Effective **plant selection** is crucial for nutrient absorption and pollutant removal in constructed wetlands. Species like cattails, bulrushes, and sedges are commonly used.

2. Constructing wetlands **requires significant land**, which can be a limitation, especially in urban areas with limited space.

3. While effective, constructed wetlands may not achieve the same level of purification as conventional treatment plants for **heavily polluted water**.

4. **Regular maintenance** is essential to ensure proper functioning, prevent clogging, and control mosquito breeding.

5. Challenges include the need for clear **policies and regulations**, raising awareness among stakeholders, technical expertise, and continuous monitoring to optimize performance.

How to make this practice more effective?

1. **Design Optimization**: Learning from Germany and the Netherlands, India can adopt multi-stage systems with both surface flow and subsurface flow configurations tailored to different influent characteristics.

2. **Performance Monitoring**: Following US EPA recommendations, establishing clear protocols for monitoring water quality parameters and wetland health is essential for maximizing treatment efficiency and addressing potential issues.

3. **Policy and Regulation**: Recognizing constructed wetlands as a viable wastewater treatment option, the Central Pollution Control Board (CPCB) should develop supportive policy frameworks. This includes incentives for municipalities and industries, along with guidelines for design, operation, and maintenance.

4. **Financial Instruments**: Exploring innovative financing mechanisms such as Public-Private Partnerships (PPPs) and subsidies can attract investment and make constructed wetlands more accessible, especially for smaller communities.

5. **Demonstration Projects**: Implementing successful demonstration projects across diverse geographical and climatic zones in India will showcase the effectiveness of constructed wetlands in practical scenarios and provide valuable data for future applications.

6. **Community Engagement**: Involving local communities in the planning, construction, and operation phases is crucial. This includes raising awareness about the benefits of constructed wetlands and fostering community ownership for long-term sustainability.

7. Mangrove Conservation

A recent report by a group that tracks the health of plants and animals around the world, the **International Union for Conservation of Nature** (IUCN), found that many mangrove forests around the world are in trouble. Half of the ones they checked were classified as either "at risk," "in danger," or "in very bad danger." These categories are called vulnerable, endangered, and critically endangered.

More About News

1. The study, which **evaluated 36 regions across 44 countries** with the help of experts from organizations like the Global Mangrove Alliance, reveals that **nearly half** (around 50%) of the world's mangrove ecosystems are under **significant threat**.

2. The **IUCN Red List categorizes** the risk levels of ecosystems using terms like "vulnerable," "endangered," and "critically endangered." The study found:

   a. **High Risk**: Nearly **20%** of the assessed mangroves fall into the endangered or critically endangered categories, indicating a severe risk of collapse if no action is taken.

   b. **Climate Change Threat**: Close to **33%** of the world's mangrove ecosystems face threats directly linked to climate change, highlighting its significant impact on these coastal habitats.

   c. **Regional Variations**: Some regions are experiencing more severe threats than others. Mangrove ecosystems in south India, Sri Lanka, the Maldives, and the Northwest Atlantic are classified as critically endangered, indicating the most urgent need for conservation efforts.

3. This IUCN Red List assessment is considered a **crucial indicator** for the upcoming Kunming-Montreal Global Biodiversity Framework under the Convention on Biological Diversity (CBD). The findings underscore the urgent need for global cooperation and concrete action plans to protect these vital ecosystems.

Key Takeaways

1. Almost half of the world's mangrove ecosystems are at risk of disappearing.
2. Climate change poses a major threat to these coastal habitats.
3. Some regions, like south India and the Northwest Atlantic, face particularly dire situations.
4. The IUCN Red List findings highlight the importance of international collaboration for mangrove conservation.

Threats to Mangrove System

Mangrove forests, crucial coastal habitats, face a double threat: **climate change** and **human activity**.

1. Rising **sea levels** and more frequent severe storms due to climate change put mangroves at risk of disappearing.

2. Human activities like **building dams and cities** disrupt the natural water flow, harming the mangroves. Pollution from sewage, industrial waste, and unsustainable fishing practices like shrimp farming also poison the water and damage these ecosystems.

Mangroves and its Ecosystem Services

1. Mangrove ecosystems cover approximately **150,000 square kilometres**, primarily on tropical, subtropical, and warm temperate coastlines globally, representing roughly **15% of the world's coastlines**.

2. These ecosystems play a significant role in **carbon sequestration**, storing an estimated 11 billion tonnes of carbon. This is noteworthy as it's nearly three times the amount stored by tropical forests of a similar size.

3. Mangroves provide **vital protection for coastlines**. Healthy mangrove ecosystems can help mitigate the effects of rising sea levels and offer a natural buffer against extreme weather events.

4. Furthermore, mangroves are crucial for **biodiversity conservation**. They support a wide variety of plant and animal life.

Initiatives for Mangroves Conservation

1. The 2023 **India State of Forest Report** (ISFR) by the **Forest Survey of India** (FSI) shows a positive trend in India's mangrove cover. There's been a measurable **increase of 17 sq km** (0.34%) compared to the previous assessment.

2. The Ministry of Environment, Forest and Climate Change (MOEF&CC) is actively involved in mangrove conservation efforts through the **Mangrove Initiative for Shoreline Habitats & Tangible Incomes** (MISHTI) program.

   a. The initiative aims to **expand mangrove cover** along the coastline and on saltpan lands.

   b. MISHTI provides **financial assistance** to local communities, potentially incentivizing their participation in mangrove plantation projects.

   c. **Educating people** about the importance of mangroves and their role in environmental protection is another aspect of the program.

3. **Sustainable Aquaculture in Mangrove Ecosystems (SAIME)**: This initiative promotes the use of Integrated Mangrove Aquaculture (IMA) systems. IMA farms integrate mangroves directly into aquaculture ponds, creating a more sustainable and environmentally friendly approach to shrimp farming.

4. **Magical Mangroves Campaign**: Led by WWF India, this campaign engages citizens in nine coastal states, raising awareness about the importance of mangrove conservation and potentially encouraging their participation in protection efforts.

5. **National Coastal Mission Programme on Mangrove and Coral Reef Conservation**: This government program focuses on creating annual Management Action Plans (MAPs) specifically for mangrove conservation and management. These plans likely outline specific actions and strategies to protect these vital ecosystems.

How to Increase Mangrove Conservation?

Legal Framework: India has a strong legal foundation for mangrove protection through existing laws like:

   a. Indian Forest Act, 1927
   b. Environmental Impact Assessment (EIA), 1986
   c. Forest Conservation Act, 1980

Ecological Conservation Measures:

1. **Restoration**: Identifying and focusing restoration efforts on suitable regions to expand mangrove cover.

2. **Green Belts & Buffer Zones**: Creating green belts and buffer zones around existing mangrove forests helps maintain their ecological integrity.

3. **Wetland Management**: Regulating wetland soil elevation and sediment flow through rivers helps sustain mangrove habitats.

4. **Connectivity**: Connecting mangrove forests with terrestrial areas like national parks (e.g., Sundarbans) improves overall conservation efforts.

Research and Development:

1. **Data Collection**: Conducting core research and collecting data on mangrove varieties at various scales allows for localized, customized conservation solutions.

2. **Germplasm Preservation Centers**: Identifying and designating important mangrove areas as "Mangrove Germplasm Preservation Centres" can enhance their management and protection.

International Collaboration:

1. **UN Decade for Ecosystem Restoration**: Aligning with the UN initiative (2021-2030), India can collaborate internationally to channel global political will, scientific expertise, and financial resources towards mangrove conservation as a key focus within marine ecosystem restoration efforts.

This comprehensive approach highlights India's commitment to protecting these vital ecosystems through legal frameworks, on-the-ground restoration initiatives, research & development, and international cooperation.

8. Fire Safety Regulations in India

Recent fires in Rajkot's (Gujarat) gaming zone, a Harda (Madhya Pradesh) firecracker factory and a Delhi hospital have sparked concerns about fire safety in India.

More About News

1. A **National Crime Records Bureau** (NCRB) report revealed a troubling fire safety situation in India.

2. In 2022 alone, over 7,500 fire accidents **claimed 7,435 lives**.

3. Notably, Delhi itself recorded around **800 factory fires** in the past two years.

4. These incidents highlight the need to **address key causes** like violations of fire safety norms, negligence, electrical problems, and industrial accidents.

Existing Fire Safety Regulations in India

1. **Constitutional Framework**:
   a. **State Subject**: Fire service falls under the responsibility of individual states as per the 12th Schedule of the Constitution. This empowers municipalities to manage fire safety within their jurisdictions.

2. **National Building Code** (NBC):
   a. **Central Standard**: Established by the Bureau of Indian Standards (BIS), the NBC sets national fire safety guidelines. These cover building construction requirements, maintenance, exit strategies, and fire safety measures.

b. **State Implementation**: States are obligated to incorporate the minimum fire safety and rescue measures outlined in the NBC into their local building bylaws.

3. **Additional Supporting Measures**:

a. **Model Building Bye Laws** (2016): Issued by the Ministry of Housing and Urban Affairs, these provide a recommended framework for states to develop their building bylaws.

b. **Model Bill for Fire & Emergency Service** (2019): This model framework guides states in establishing and maintaining effective fire and emergency services.

c. **Fire and Life Safety Guidelines** (2020): The Ministry of Health issued guidelines mandating third-party fire safety accreditation, Fire Response Plans (FRPs), and other measures.

d. **Scheme for Expansion & Modernization** (2023): A central government initiative launched in 2023 to strengthen fire services in states until 2025-26.

Challenges to Maintaining Fire Safety Standards and Solutions

Challenge 1: Uneven Legislation and Enforcement

- **Problem:** Fire safety laws are inconsistent across states, and even when laws exist, they may not be updated or properly enforced. Key provisions like fire safety audits are not mandatory in many areas.

- **Solution:**
  a. Harmonize fire safety legislation across India, ensuring it aligns with the Model Fire Act (2019).
  b. Make fire safety audits mandatory for all high-occupancy buildings nationwide.
  c. Strengthen enforcement mechanisms to ensure consistent application of fire safety laws.

Challenge 2: Weak Implementation and Limited Resources

- **Problem:** Local bodies often fail to conduct thorough or regular fire safety checks due to poor inspection quality, infrequent follow-ups, and potential corruption. Fire departments lack adequate resources, personnel, and equipment.

- **Solution:**
  a. Improve the quality of fire safety inspections through better training and oversight.
  b. Increase funding and resources for fire departments to ensure they have adequate personnel, equipment, and training.
  c. Implement the NDMA guidelines for fire services equipment and training.

Challenge 3: Other Systemic Challenges

- **Problem:** Lenient penalties for fire safety violations, poorly structured fire departments, limited career progression for fire service personnel, and a lack of necessary infrastructure hinder fire safety efforts.

- **Solution:**
  a. Strengthen penalties for fire safety violations to deter non-compliance.
  b. Restructure fire departments to improve efficiency and effectiveness.
  c. Invest in infrastructure to support fire safety efforts.

Challenge 4: Urbanization Issues

- **Problem:** High population density in urban areas increases fire casualty risks and complicates evacuation during emergencies. Poor urban planning with congested layouts and narrow lanes hinders fire response.

- **Solution:**
  a. Incorporate fire safety considerations into urban planning and development.
  b. Ensure adequate access for fire engines and emergency responders in urban areas.
  c. Conduct regular fire safety drills in residential areas and schools to prepare residents for emergencies.

Challenge 5: Non-Compliance

- **Problem:** Many fire incidents occur due to violations of fire safety standards by builders, private entities, and individuals.

- **Solution:**
  a. Enforce fire safety standards more rigorously and impose harsher penalties for violations.
  b. Conduct Hazard Identification & Risk Assessment (HIRA) to proactively identify and mitigate fire hazards.
  c. Raise public awareness about fire safety and the importance of compliance.

NDMA Guidelines

1. **Laws and Fire Services**: All states should have Fire Acts requiring mandatory fire department approval for specific buildings.

   a. Additionally, comprehensive state plans are needed to modernize fire services with more stations, water reserves, and training centres. Expanding fire services to lower levels would improve response times.

2. **Public Awareness, Training, and Technology**: Communities need fire safety education, and professional fire service leadership is essential.

   a. Investing in water-saving fire tech and state-of-the-art training centres will enhance firefighter skills.

3. **Additional Measures**: Mandatory annual fire safety audits for high-occupancy buildings, proactive hazard identification, stricter enforcement with harsher penalties, and strengthening local fire departments through increased funding and training, aligned with National Disaster Management Authority (NDMA) guidelines, are all crucial steps.

9. International Solar Alliance (ISA)

In May, 2024 Spain became the 99th member country of the International Solar Alliance (ISA).

About ISA

1. **Objective**: A treaty-based intergovernmental organization, serving as an action-oriented, member-driven, **collaborative platform** to increase the deployment of solar energy technologies.

2. **Genesis**: Jointly launched by **India and France** in **2015 during COP-21** of the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. It was officially established in 2017 with the entry into force of the ISA Framework Agreement. The amendment of the Framework Agreement in 2020 made all member states of the United Nations eligible to join the ISA.

3. **Key Strategy**: Guided by the '**Towards 1000**' strategy, ISA aims to:

   a. Mobilize USD 1,000 billion in **investments** for solar energy solutions by 2030.

   b. Deliver **energy access** to 1,000 million people.

   c. Install 1,000 GW of **solar energy capacity**.

4. **Observer Status of UN**: In 2021, the UN General Assembly conferred Observer Status to the ISA.

5. **Headquarters**: Gurugram, India.

Significance of ISA

1. Promoting a fair **energy shift** through solar energy by enabling technology transfer, mobilizing financial resources, and more.

2. ISA, alongside initiatives like the Global Biofuels Alliance and Coalition for Disaster Resilient Infrastructure, enhances **India's soft power** on the global stage.

Initiatives Taken by ISA

1. **One Sun One World One Grid** (OSOWOG): Aims to connect different regional grids through a common grid that will be used to transfer renewable energy power.

2. The **Global Solar Facility** (GSF): Catalyze solar investments in underserved segments and geographies across Africa.

3. **Solar Technology Application Resource Centre** [STAR C] Initiative: To support capacity-building efforts.

4. Development of **Large-Scale Solar Power Projects** under the Solar Park Concept in Cluster/Group of ISA Member Countries.

10. World Wildlife Crime Report 2024

United Nations Office on Drugs and Crime (UNODC) released World Wildlife Crime Report 2024

What is wildlife crime?

1. It can be defined as taking, **possession, trade or movement, or consumption** of wild animals and plants or their derivatives in contravention of any international, regional, or national legislation.

What are the factors driving wildlife crime?

1. **High Demand**: There is a strong black market for wildlife products due to their use in traditional medicine, exotic pets, bushmeat, and ornamental plants.

2. **Lucrative Profits**: Illegal traders exploit this demand, generating significant profits from the sale of endangered species and their body parts, like rhinoceros' horns.

3. **Enforcement Challenges**: Corruption weakens government efforts to control wildlife harvesting, trade, and use, creating loopholes for criminals to operate.

Key Findings of the Report

1. **Most Trafficked**: Rhinos were the animals **most impacted by wildlife trafficking** between 2015 and 2021, based on seizure data.

2. **Plant Focus**: Cedars topped the list of **trafficked plants** during the same period.

3. **Animal Seizure Trends**: Seizures of animals (including crocodiles) showed a gradual increase from 2015 to 2019, followed by a decline in 2020 and 2021.

4. **Plant Seizure Trends**: Plant seizures saw a significant rise in 2020 and 2021, contrasting the trend for animals.

5. **Overall**: This data highlights the ongoing threat of wildlife trafficking, with both animals and plants being targeted.

Impact of Wildlife Crime & Potential Solutions

Impact of Wildlife Crime	Potential Solution
1. **Reduced wildlife populations**	• Stricter enforcement of anti-poaching laws and regulations
2. **Threat of invasive species**	• Increased monitoring and control of invasive species, stricter biosecurity measures at borders
3. **Loss of biodiversity**	• Increased funding for conservation efforts, stricter penalties for wildlife crimes
4. **Degraded ecosystems**	• Focus on habitat restoration and conservation, promotion of sustainable land use practices

11. Nor Wester

India is setting up its **first-ever research facility** to study the weather phenomenon known as Nor'westers.

What are Nor Westers?

1. Nor'westers are **strong, localized winds** impacting the **eastern and northeastern regions** of India every summer.

2. These winds bring **intense thunderstorms** and are known by different names in various areas: "**Kalbaishakhi**" (meaning "calamity of Baisakh") in Bengal and "**Bardoli Chheerha**" in Assam.

3. Impact of Nor Westers:
   a. They deliver **pre-monsoon showers** that are crucial for the health of crops like jute, paddy, vegetables, and fruits. Additionally, the sudden drop in temperature provides a welcome respite from the oppressive midday heat.
   b. However, they are also known to **spawn tornadoes**, uprooting trees and causing property damage.

About Research Facility

1. **Goal**: To gain a deeper understanding of Nor'westers, powerful summer thunderstorms affecting eastern India.

2. **Focus**:
   a. **Storm Formation**: Scientists will closely observe the initial stages of Nor'wester development.
   b. Growth: The testbed will **track** how these storms intensify.
   c. **Movement**: Researchers will **study the paths** Nor'westers take as they travel across the region.
   d. **Location**: The testbed will cover a large area encompassing West Bengal, Odisha, and Jharkhand. Chandbali, Odisha's Bhadrak district (near Bhubaneswar), will serve as the control center.

3. **Collaboration**: This initiative involves three key Indian agencies:
   a. **India Meteorological Department (IMD)**
   b. **Indian Institute of Tropical Meteorology (IITM), Pune**
   c. **National Centre for Medium-Range Weather Forecasting (NCMRWF), Delhi**

4. **Significance**: This collaborative research effort aims to improve Nor'wester **prediction** and potentially develop **mitigation strategies** for these impactful weather events.

Other Local Winds and Their Influence

1. **Loo:** Loo, hot and dry winds blowing throughout the day in northern and western India during May and June, are a consequence of the Monsoon Low Pressure Trough forming in northern India.

   a. **Negative Effects**: Loo winds pose a significant health risk, causing dehydration and even loss of life in extreme cases.

   b. **Positive Effects**: Despite their harsh nature, Loo winds do offer some benefits. They aid in separating chaff from grains during the harvest season, and the dry conditions contribute to a decline in mosquito populations, leading to a decrease in insect-borne diseases like malaria.

2. **Aandhi:** Also known as '**Kali Aandhi**,' these are powerful **dust storms** that occur in northwestern and Central India **before the monsoon season**. They can cause loss of life and property and contribute to pollution in cities like Delhi.

3. **Mango Showers:** They are **pre-monsoon** local rain-carrying winds that bring early showers along the coasts of **Karnataka and Kerala**. These rains help in the **early ripening of mangoes**, which is why they are locally called Mango Showers.

4. **Blossom Showers:** They are **pre-monsoon showers** in late summer in Kerala and nearby regions. These rains help **coffee flowers to bloom**, which is commercially important for the state.

5. **Elephanta:** They are strong **southerly and southwesterly winds** that blow along the Malabar coast of India after the monsoon, in September and October. These winds signify the **end of the southwest monsoon**.

12. Why Sky Glow even after Sunset?

1. The sun may have set, but it still **illuminates the upper atmosphere** from beneath the horizon.

2. This **scattered sunlight** causes the **sky to glow**, explaining the **red evening sky**.

3. Both this and the daytime blue sky result from **Rayleigh scattering**, where sunlight is scattered by air particles smaller than the light's wavelength.

4. As the sun sets further, **less sunlight reaches the upper atmosphere**, and nightfall begins when the sun is about 18 degrees below the horizon.

5. **Daylight arrives similarly**, in reverse. When the sun is 18 degrees below the eastern horizon, the sky starts to turn red near the horizon.

6. Day breaks once the sun crosses the horizon as seen by the observer.

7. The sky can still glow after the sun is 18 degrees below the horizon due to starlight scattering and increasing light pollution.

Rayleigh Scattering

1. Rayleigh scattering refers to the **scattering of light by particles** that are up to one-tenth the wavelength of the light.

2. This scattering occurs **without any loss of energy** or change in wavelength.

3. For light frequencies well below the resonance frequency of the scattering medium, the **amount of scattering is inversely proportional** to the fourth power of the wavelength.

4. This means **blue light**, with its shorter wavelength, is **scattered much more** than red light as it travels through the air.

13 Glacier Erosion (Venezuela)

1. According to the **International Cryosphere Climate Initiative** (ICCI), the Humboldt Glacier, **Venezuela's last glacier** in the Andes, **has shrunk** to the point where it no longer qualifies as a glacier.

2. The ICCI is a **network of experts and researchers** working with governments and organizations to preserve the **Earth's cryosphere**, which includes snow and ice on land, ice caps, glaciers, permafrost, and sea ice.

3. A glacier is a **large mass of ice** and snow that moves slowly over land. Glaciers are melting rapidly due to factors like **global warming** and warming ocean waters. This affects both Alpine glaciers, such as those in the Hindu Kush Himalayas, and ice sheets, such as those in Antarctica.

Impact of Glacier Melting

1. According to NASA, if all glaciers and ice sheets melted, **global sea levels would rise** by more than 60 meters. This would lead to increased coastal erosion and higher storm surges.

2. Melting ice **affects wildlife**, such as walruses **losing their habitats** and polar bears spending more time on land. This increases the likelihood of conflicts between people and bears.

3. The frequency of **glacial lake outbursts** (GLOFs) in regions like the Himalayas is expected to rise.

4. **Reduced water availability in rivers** like the Ganges, and economic activities such as fishing and navigation, would be significantly affected.

Steps Taken To Protect Glaciers

1. **Global**
   a. **Hindu Kush Himalayan Monitoring and Assessment Programme** (HIMAP) launched by the International Centre for Integrated Mountain Development (ICIMOD) etc.
   b. UNESCO's **World Glacier Monitoring Services**.
   c. Year 2025 has been declared as the **International Year of Glacier** Preservation by the United Nations.

2. **India**
   a. **National Mission for Sustaining Himalayan Ecosystem**: part of the National Action Plan on Climate Change (NAPCC), launched in 2008.
   b. Research station '**Himansh**' was established in the Chandra basin (Himachal Pradesh) in 2016.

14. Sea Anemone

Scientists have found mass sea anemone bleaching off Agatti island, Lakshadweep.

About Sea anemone:

1. They are ocean-dwelling members of the **phylum Cnidaria**.
   - **Sea anemones** are predatory animals and most species are found in coastal tropical waters.

2. Like corals, sea anemones establish symbiotic relationships with green algae.

3. Sea surface temperature rise disrupts this relationship, resulting in bleaching.

4. They also have a symbiotic relation with clownfish.
   - **Clownfish** are protected by the stinging tentacles of anemone and anemone gets food from Clownfish's meals.

5. They play key biogeochemical roles in benthic ecosystem

15. Batillipes chandrayaani

1. A new species of **marine tardigrade** discovered from the southeast coast of **Tamil Nadu** has been named Batillipes chandrayaani after the **Chandrayaan-3 moon mission** by researchers at the Cochin University of Science and Technology (Cusat).

2. The **Indian Space Research Organisation** (ISRO) is credited with the first landing near the south pole of the moon.

3. Found in the **sandy area** between the **high and low tide marks** at Mandapam, Tamil Nadu.

4. Classified as the **39th type of tardigrade** under the genus Batillipes.

5. **Head**: Resembles a trapezoid shape.

6. **Legs**: Possesses four pairs of legs.

7. **Leg Features**: Legs have pointy spines, which likely aid in sensing the environment.

What are Tardigrades?

1. Tardigrades, commonly known as "**water bears**," are **microscopic** marvels of nature.

2. **Marine tardigrades** constitute **17% of all known tardigrade species**, thriving in every ocean.

3. Tardigrades have evolved **unique survival mechanisms**, including cryptobiosis.

4. This process allows tardigrades to enter a **reversible state of metabolic dormancy**, suspending their biological activities until conditions improve.

G. SOCIETY AND CULTURE

1. Women Entrepreneurs In India

Reserve Bank of India's Innovation Hub (RBIH) recently published a white paper titled '**At the Helm: Women Entrepreneurs Transforming Middle India.**'

More about News

1. The report examines the **complex socioeconomic factors** impacting women's participation in entrepreneurship, **particularly in Tier II and Tier III cities.**
2. Despite advancements in education **and workplace legislation, women entrepreneurs** remain **underrepresented** in these areas.
3. The study underscores the need for immediate action to address this gap and empower women entrepreneurs in Middle India, recognizing their potential to play a transformative role in the region's economic development.

Significance of Women Entrepreneurs in Middle India

1. **Economic Significance:**
   a. **Sustainable Economic Development & Employment Generation:** Increased women's entrepreneurship can create millions of jobs and significantly boost economic growth.
      - 13.76% of entrepreneurs are women (NITI Aayog).
      - 57th place of India among 65 countries in MasterCard Index of Women Entrepreneurs (MIWE,2021)
   b. **Poverty Alleviation:** Including more women in the workforce can raise GDP and sustainably increase family income.
2. **Social Significance:**
   a. **Gender Equality:** Women entrepreneurs help bridge the gender gap in business and promote gender equality.
      - Only 19.2% of Indian women participate in the workforce, in stark contrast to 70.1% of men, highlighting a significant employability gap of 50.9% (ILO).

b. **Fuller Utilization of Human Capital:** Increasing female labor force participation utilizes untapped potential.
3. **Women Empowerment:** Women entrepreneurs gain financial independence and decision-making authority, empowering themselves and inspiring others.
   - **Example: Usha Jha:** Affectionately known as 'Usha auntie' in Patna, supported women with entrepreneurial aspirations.

Challenges and Solution for Women Entrepreneurs in Middle India

Challenges	Description	Solution
1. **Capital Gap**	Only 3% of women entrepreneurs access external funding, hindering business growth.	Provide grants to women entrepreneurs and female-focused Venture Capital funds.
2. **Data Gap**	Lack of gender-disaggregated data makes it difficult to present compelling business cases to investors.	Collect and analyze gender-disaggregated data at a granular level to inform policy interventions and attract investors.
3. **Visibility Gap**	Societal undervaluation and stereotypes limit the recognition of women entrepreneurs' work.	Showcase success stories of local women entrepreneurs through new urban infrastructure and platforms. pen_spark

4.	Safety Gap	Cities perceived as safer for women tend to have more entrepreneurs.	Improve women's safety to foster a more vibrant entrepreneurial ecosystem.
5.	Network Gap Care Gap	Migration due to marriage disrupts social networks, hindering career progression.	Develop programs and initiatives to support women in rebuilding social networks after migration.
6.	Care Gap	Women entrepreneurs often experience career pauses due to caregiving responsibilities.	Offer fiscal incentives to female-owned businesses for childcare leave and expenses.

Major Initiatives Taken:

1. **Mudra Yojana for Women/ Mahila Udhyami Yojana**: By Ministry of Finance, Loans up to Rs 10 lakh are provided to women entrepreneurs, without any collateral, and with low interest with flexible repayment tenure.

2. **Pradhan Mantri Virasat Ka Samvardhan (PM Vikas) Scheme**: By Ministry of Minority Affairs, focuses on to improve livelihoods of the minorities with a focus on women, youth and disabled.

3. **Mahila Samriddhi Yojana**: By Ministry of Social Justice and Empowerment, It is a Micro Finance scheme for women with a rebate in interest. Financial Assistance up to the cost of Rs. 1,40,000/- is provided.

4. **Women Entrepreneurship Platform (WEP)**: By Niti Aayog, As an aggregator platform,WEP hosts information and services relevant to women entrepreneurs. It enables key partnerships to bring crucial content, workshops, campaigns, and other avenues of learning and growth to its users from trailblazers in the industry.

5. **Trade Related Entrepreneurship Assistance and Development (TREAD):** Lending institutions/ banks would finance loan assistance for women through NGO for undertaking non-farm activities.

6. **Support to Training and Employment Programme for Women (STEP)**: By Ministry of Women and Child Development, scheme aims to provide competencies and skills that enable women to become self-employed/entrepreneurs.

7. **Stand-Up India**: For financing SC/ST and/or Women Entrepreneurs.

2. Hindu Marriages Invalid Without Proper Ceremonies: SC

The Supreme Court ruled that a **Hindu marriage is not valid 'unless performed with ceremonies in proper form'**. This was despite the couple in question having an official marriage certificate.

About Marriage

Marriage, a social institution present in virtually every culture, serves several functions and comes in various types: -

1. **C.P. Kottack:** Marriage is a socially recognized relationship between a socially recognized male (Husband) and a socially recognized female (Wife) so that the children born to the wife are accepted as the offspring of both the husband and wife.

2. **Functions of Marriage:**

   a. **Social Stability and Order:** Marriage provides a framework for organizing familial relationships, establishing legal rights and responsibilities, and maintaining social order within a community.

   b. **Reproduction and Family Formation:** Traditionally, marriage has been the primary institution for procreation and raising children. It provides a stable environment for the upbringing of offspring.

   c. **Emotional Support and Companionship:** Marriage offers emotional and psychological support through companionship, intimacy, and partnership. Spouses often rely on each other for love, encouragement, and comfort.

   d. **Economic Cooperation:** Marriage facilitates economic cooperation and pooling of resources between spouses, enabling them to share financial burdens, manage household expenses, and plan for the future together.

e. **Cultural and Religious Significance:** Many cultures and religions attach profound cultural and religious significance to marriage, viewing it as a sacred union with spiritual implications.

f. **Legal and Social Recognition:** Marriage grants legal and social recognition to the relationship between spouses, conferring rights such as inheritance, healthcare decision-making, and spousal benefits.

3. **Types of Marriage:**

a. **Monogamy:** Monogamy involves the union of two individuals, typically one man and one woman, forming an exclusive partnership. It is the **most common form of marriage** in many societies.

b. **Polygamy:**

   • **Polygyny:** Polygyny permits a man to have multiple wives simultaneously. This practice has historical and cultural roots in various societies, though it is less common today.

   • **Polyandry:** Polyandry allows a woman to have multiple husbands simultaneously. It is rarer than polygyny and is found in specific cultures, often in areas with scarce resources.

c. **Group Marriage:** Also known as communal marriage or collective marriage, group marriage involves multiple men and women forming a marital union together. This type of marriage is relatively uncommon and often associated with alternative lifestyle communities.

d. **Same-Sex Marriage:** Same-sex marriage involves the union of two individuals of the same gender. While historically marginalized or prohibited in many societies, it has gained legal recognition and acceptance in an increasing number of countries.

e. **Arranged Marriage:** Arranged marriage involves families or intermediaries selecting spouses for individuals based on various factors such as compatibility, social status, and familial considerations. While prevalent in some cultures, the degree of consent and autonomy can vary significantly.

The Supreme Court Ruling:

1. The Supreme Court **ruled that a Hindu couple**, despite possessing an official marriage certificate, was deemed to have **"never acquired the status of husband and wife."**

2. This ruling was based on the fact that the couple's marriage was registered under the Hindu Marriage Act, 1955 (HMA) before they performed the wedding rituals.

3. Consequently, the couple did not need to obtain a divorce because they were considered to have never been married in the first place.

Understanding Solemnized (Rituals) Marriage:

1. Solemnizing a marriage entail conducting an official marriage ceremony, including appropriate rituals.

2. In India, marriage is governed by personal laws and statutes like the Special Marriage Act, 1954 (SMA).

3. Different religions have their own requirements for a valid marriage, such as rituals for Hindus and Christians, and a contractual agreement for Muslims.

Registered Marriages vs. Solemnized Marriages

Feature	Registered Marriage (Special Marriage Act, 1954)	Solemnized Marriage (Personal Laws like HMA)
1. **Legal Basis**	Special Marriage Act, 1954	Respective personal laws (e.g., Hindu Marriage Act: HMA)
2. **Religious Rituals**	Not required	Required for validity
3. **Terminology**	"Court marriage," "registered marriage"	"Traditional marriage," "religious marriage"
4. **Registration**	Mandatory under the SMA	Optional, but governed by respective personal laws (e.g., Section 8 of HMA)

5.	Applicability	All Indian citizens, regardless of religion	Specific to a particular religion
6.	Procedure	Notice, declaration, solemnization at designated office	Ceremonies as per religious customs

Implications of Marriage Registration

1. Marriage registration serves various official purposes, such as spousal visa applications and joint medical insurance.

2. However, the absence of marriage registration does not inherently invalidate a marriage, as registration alone does not confer validity.

Legal Presumptions and Evidence

1. Various legal presumptions exist regarding marriage, such as the presumption of marriage when cohabitation is continuous.

2. Evidence of a valid marriage includes proof of performing rituals, long-term cohabitation, and acceptance by family and friends.

3. While a marriage certificate holds corroborative value, it is not considered conclusive evidence on its own in legal proceedings.

Significance in Legal Matters:

1. Validity of marriage is crucial in legal contexts like bigamy trials and inheritance disputes.

2. Proof of performing valid rituals, evidence of cohabitation, and acceptance by family and friends are essential in establishing the validity of marriage.

3. A marriage certificate supplements evidence but is not sole proof of marriage validity.

3. Allegations of Child Labor Raised in India

In recent developments, the Australian Joint Standing Committee on Trade and Investment Growth released a report raising concerns about child and forced labor in India.

a. This report emerged amid ongoing negotiations between India and Australia for the **Comprehensive Economic Cooperation Agreement (CECA)**, which aims to expand the **existing Economic Cooperation and Trade Agreement (ECTA) signed in 2022.**

Allegations Made by the Australian Panel:

1. The **Australian committee's report** highlighted concerns about child and forced labor in India based on claims made by the Community and Public Sector Union (CPSU) and the State Public Services Federation (SPSF Group).

2. The **report recommended** that the Australian Government incorporate human rights, labor, and environmental chapters into its trade agreements, aligning with United Nations and International Labor Organisation conventions and declarations signed by Australia.

Facts Supporting Australia's Claim:

1. According to the **2023 Global Slavery Index estimates by Walk Free,** India had the highest number of people living in modern slavery on any given day in 2021, with an estimated 11 million individuals**.**

2. Census data indicates that there were **approximately 259.6 million children in India aged 5-14 years,** with an estimated **10.1 million (3.9% of the total child population) engaged in work either as 'main workers' or 'marginal workers'.**

India's Response to the Allegations:

1. The **Indian government firmly denies the allegations of child labour**, asserting that existing rules and regulations **strictly prohibit child labor and bonded labor.**

2. **Constitutional Protection:** India's Constitution safeguards **labor rights and empowers both the central and state governments to enact laws such as the Bonded Labor System (Abolition) Act, 1976**, which is designed to protect workers' **rights**, including the right to form unions and address issues of harassment.

3. **Licensing and Compliance:** All business entities in India are **licensed by local governing bodies** and must comply with **labor welfare laws established** by the union and state governments.

4. **Comprehensive Records:** Processing units are **required to maintain comprehensive records** related to processing, quality control, employee training, and compliance with applicable regulations.

Legal Provisions Addressing Child Labor and Forced Labor in India:

1. **Constitutional Rights:**

   a. **Article 23:** Prohibits trafficking in human beings and forced labor, providing protection against exploitation and degrading work conditions.

   b. **Article 24:** Prohibits the employment of children **under 14 in factories, mines, or hazardous** occupations to safeguard their health, development, and access to education.

   c. **Article 39:** Outlines **principles that the State should follow, including equal rights to livelihood, equal pay for equal work**, and opportunities for children to develop in a dignified and healthy manner.

2. **Legislations Against Child Labor:**

   a. **Child Labour (Prohibition & Regulation) Act, 1986 (amended in 2016):** Bans employing children under 14 in all work, with certain exceptions for family businesses, entertainment industry, and adolescent work in non-hazardous occupations.

   b. **Factories Act, 1948:** Prohibits the employment of children under 14 in factories.

   c. **Mines Act, 1952:** Prohibits the employment of children under 18 in mines.

   d. **Juvenile Justice (Care and Protection of Children) Act, 2015:** Includes working children under the category of **"in need of care and protection."**

   e. **National Policy on Child Labour (1987):** Focuses on the rehabilitation of children already engaged in work.

   f. **The Right of Children to Free and Compulsory Education (RTE) Act, 2009:** Ensures free education and indirectly prevents child labor by keeping children in school.

3. **Legislations Against Forced Labor:**

   a. **Bonded Labour System (Abolition) Act, 1976:** Criminalizes bonded labor (debt traps).

   b. **Central Sector Scheme for Rehabilitation of Bonded Labourer, 2021:** Provides financial assistance for the rehabilitation of freed bonded laborers.

Who are bonded labour and what are the related provision ?

1. **Bonded Labor:**

   a. Defined by the **National Human Rights Commission of India**, bonded labor is a severe form of modern slavery, also known as **debt bondage**.

   b. It involves workers being forced to work for extended periods with little pay, often as a way to settle debts.

2. **Supreme Court Ruling:**

   a. In 1983, the **Supreme Court** ruled in the **People's Union for Democratic Rights (PUDR) vs. Union of India** case that the right against forced labor includes the **right to a minimum wage.**

   b. The Court recognized that migrant and contract laborers often **had no choice but to accept work for less than the minimum wage,** deeming this economic compulsion a form of forced labor.

3. **Constitutional Guarantee:**

   a. The Court emphasized the **need for a constitutional guarantee of the minimum wage to address the issue of forced labor.**

   b. This guarantee ensures that **workers are protected from exploitation and receive fair compensation for their work.**

4. Street Vendors Act, 2014

A **decade has passed** since the Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act came into effect on **May 1, 2014**, marking a significant milestone following nearly four decades of legal advocacy and the dedicated efforts of street vendor movements across India.

About Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act

1. The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act aims to **protect and regulate street vending in cities**, with State-level rules and schemes implemented by Urban Local Bodies (ULBs) through by-laws, planning, and regulation.

2. It defines the **roles and responsibilities of vendors and government levels**, establishing participatory governance via Town Vending Committees (TVCs) where vendor representatives constitute 40%, including 33% women.

3. These committees ensure all existing vendors are included in vending zones, with mechanisms for **grievance redressal** chaired by a civil judge or judicial magistrate.

4. The Act proposes **limiting vendors to 2.5% of the local population**, recognizing their urban role and committing to livelihood protection by accommodating existing vendors in designated zones and issuing vending certificates.

About PM Street Vendor's AtmaNirbharNidhi

1. The PM Street Vendor's AtmaNirbharNidhi (PM SVANidhi) Scheme, launched on June 1, 2020, is a **micro credit scheme** for urban street vendors that aims to provide **collateral-free** working capital loans up to ₹50,000.

2. Under the scheme regular repayments are incentivized with a **7% interest subsidy** and digital transactions are rewarded with cashback up to ₹1,200 per year.

3. The scheme employs **Aadhaar-based e-KYC**, utilizes an end-to-end IT platform, and employs SMS-based notifications for application status updates.

4. All lending institutions, including **NBFCs/MFIs and DPAs**, have partnered with the aim to alleviate urban poverty in India.

Challenges in Implementing the Street Vendors Act

1. **Bureaucratic Challenges**: Street vendors often face eviction threats due to an outdated bureaucratic mindset that views them as illegal entities rather than recognizing their legitimacy under the Street Vendors Act.

2. **Awareness Gap**: There is a pervasive lack of awareness and education about the rights and protections provided by the Street Vendors Act among state authorities, the general public, and even among the vendors themselves.

3. **Limited Influence of TVCs**: Town Vending Committees (TVCs) often operate under the control of local authorities, limiting meaningful participation from street vendor representatives. Women vendors, in particular, may face tokenistic representation within these committees.

4. **Governance Challenges**: Existing urban governance mechanisms often lack integration with the provisions of the Street Vendors Act and the framework set by the 74th Constitutional Amendment Act. Urban Local Bodies (ULBs) frequently lack the necessary authority and capacity to effectively implement the Act.

5. **Social Exclusion**: The pursuit of 'world-class cities' often excludes street vendors, stigmatizing them as obstacles to urban development rather than recognizing their role as essential contributors to the urban economy. This exclusionary mindset influences city planning, policies, and public perceptions of neighbourhoods.

What more could be done?

1. **Progressive Legislation**: The Street Vendors Act is comprehensive and progressive but requires initial direction from the Ministry of Housing and Urban Affairs, transitioning to decentralized management.

2. **Decentralization for Effective Implementation**: Enhancing Urban Local Bodies' (ULBs) capacities and decentralizing management are crucial for

implementing the Act effectively, shifting from department-led actions to inclusive processes at the Town Vending Committee (TVC) level.

3. **Integration into Urban Planning**: City planning guidelines, urban schemes, and policies should explicitly incorporate and support street vending to ensure their integration into urban development plans.

4. **Addressing New Challenges**:
   a. Climate Change Impact: Consider how climate change affects street vendors' working conditions and sustainability.
   b. Rising Vendor Numbers: Manage and support the increasing number of street vendors.
   c. E-commerce Competition: Address competitive pressures from online markets affecting street vendors.
   d. Income Stability: Develop innovative solutions to stabilize and enhance street vendors' earnings.

5. **Reviewing Vendor Limits**: Given the inadequacy of the 2.5 per cent cap on street vendors in densely populated cities like Mumbai and Delhi, the Ministry of Housing and Urban Affairs should explore revisiting this ceiling to accommodate economic activities appropriately.

The sub-component focusing on street vendors within the National Urban Livelihood Mission must adapt to current conditions and introduce innovative measures to meet their evolving needs. PM SVANidhi, which offers micro-credit to street vendors, serves as a commendable example in this regard.

5. Tobacco Epidemic In India

1. Tobacco remains the most preventable cause of disease and death globally. India, with the world's **second-largest population** of tobacco consumers (nearly 26 crore), bears a significant burden of tobacco-related illnesses and mortality.

2. **World No Tobacco Day observed on 31st May** annually, aims to highlight the devastating consequences of tobacco use and advocate for stronger tobacco control measures.

3. The **2024 theme, "Protecting Children from Tobacco Industry Interference,"** underscores the industry's tactics to attract young users.

Key Facts about Tobacco Usage in India

1. Tobacco use claims an estimated 1.35 million lives annually in India.

2. While tobacco use has declined across most demographics, it has seen an increase among women (2.1%) between 2015 and 2021.

3. Cigarettes, bidis, and smokeless tobacco have become more affordable, partly due to the integrated tax system under the Goods and Services Tax (GST).

India's Legislative Framework for Tobacco Control

1. **WHO Framework Convention on Tobacco Control (FCTC):** India is a signatory to this international treaty, demonstrating its commitment to global tobacco control efforts.

2. **Cigarettes and Other Tobacco Products Act (COTPA), 2003**: This comprehensive law regulates various aspects of tobacco, including production, advertising, sale, and packaging.

3. **National Tobacco Control Program (NTCP), 2007**: Established to strengthen COTPA implementation and ensure compliance with the FCTC, the NTCP focuses on public awareness, cessation initiatives, and enforcement mechanisms.

4. **Prohibition of Electronic Cigarette Act (PECA), 2019**: This act banned the production, manufacture, import, export, transport, sale, distribution, storage, and advertisement of e-cigarettes in India.

Hidden Costs of Tobacco: Beyond Health Risks

1. **Environmental Degradation**: Tobacco cultivation depletes soil nutrients, leading to increased fertilizer use and further soil degradation. Additionally, it contributes to deforestation as significant amounts of wood are required for tobacco processing.

2. **Waste Generation and Management**: The production and consumption of tobacco create a substantial waste burden, with an estimated 1.7 lakh tonnes of tobacco waste generated annually in India. The cost of cleaning up this waste is estimated at Rs. 6,367 crore annually.

3. **Economic Burden:** Tobacco-related healthcare costs are immense, exceeding Rs. 1.7 lakh crore in 2017-18. This surpasses the national health budget and represents a significant economic burden for the country.

4. **Occupational Hazards**: Over 6 million people working in the tobacco industry are exposed to health risks due to tobacco absorption through the skin.

	Challenge	Solution
1.	Non-compliant Products (Smokeless tobacco, smuggled tobacco)	Strengthen legislation to address novel tobacco products
2.	Weak Penalties	Increase penalties for COTPA violations
3.	Surrogate Advertising	Counter surrogate advertising with stricter regulations
4.	Stalled Amendments	Update and strengthen COTPA
5.	Limited Enforcement Capacity	Enhance enforcement capacity of NTCP
6.	Limited Alternative Livelihoods for Tobacco Farmers	Support farmers' transition to alternative livelihoods
7.	Lack of Data-Driven Strategies	Regularly collect and analyze data on tobacco use patterns

Conclusion

India's fight against tobacco is a multifaceted challenge that requires a comprehensive and sustained approach. By strengthening legislation, increasing taxation, enhancing enforcement, and supporting farmers' transition, India can effectively curb tobacco use and mitigate its devastating consequences for public health and the economy.

6. World Migration Report 2024

The International Organization for Migration (IOM) has released its World Migration Report 2024.

Global Trends:

1. **Displacement Crisis Intensifies**: The alarming rise in **displaced people (117 million)** underscores the urgency of addressing conflicts and mitigating climate change. These dual threats are reshaping the global landscape, forcing millions to seek safety and security elsewhere.

2. **Migration as a Global Phenomenon**: With **281 million international migrants**, the report reminds us that migration is not an isolated issue but a global reality intertwined with economic, social, and political factors.

India related findings

1. In India, strong influence of climate impacts on internal migration from Rajasthan, Uttar Pradesh and Madhya Pradesh.

2. India hosts the **world's largest number of international migrants** (18 million), residing notably in UAE, USA, and Saudi Arabia.

3. In 2022, India remains the top remittance recipient country, receiving more than USD 111bn, the first country to reach and even surpass the USD 100 bn mark.

	Challenge	India's Situation spark	Potential Solutions spark
1.	Climate-Driven Internal Migration	• Increased frequency of extreme weather events displacing populations within the country.	a. Strengthen disaster preparedness and early warning systems. b. Invest in climate-resilient infrastructure and agriculture. c. Develop comprehensive internal migration policies and support systems.
2.	Lack of Safe Migration Pathways	• Large numbers of Indians migrate internationally, often through irregular channels.	a. Expand legal migration options and streamline visa processes. b. Collaborate with destination countries to create bilateral agreements for safe labor migration. c. Strengthen international cooperation to combat human trafficking and smuggling.

3. Protecting Migrant Rights	• Discrimination and violence against migrants, both internally and abroad.	a. Enforce anti-discrimination laws and promote awareness campaigns. b. Provide legal aid and support services for migrants. c. Engage with diaspora communities to foster inclusivity and integration.
4. Economic Impact of Migration	• India is a top recipient of remittances, but also a source of skilled labor emigration.	a. Invest in skill development programs to enhance the employability of potential migrants. b. Create incentives for returning migrants to contribute to the domestic economy. c. Promote circular migration models that benefit both source and destination countries.

7. Andaman's Onge Tribe

The **Onge tribe, one of India's distinctive indigenous tribes, recently celebrated the birth of a baby boy.** The arrival of this new life has taken the **tribe's total population to 136**, giving them a ray of hope to continue their unique cultural heritage.

About the Onge Tribe:

1. **History and Ancestry:**
    a. The Onge tribe is **considered one of India's most primitive tribes**, with roots in the **Negrito racial ancestry.**
    b. Their presence is centered on **Little Andaman Island, the southernmost island in the Andaman archipelago.**

2. **Semi-Nomadic Lifestyle:**
    a. Traditionally, the **Onge tribe practiced a semi-nomadic lifestyle,** relying on the ocean and the forest for sustenance.

3. **Religious Beliefs:**
    a. Unlike many other religions, the **Onge tribe does not follow firm worshipping practices or engage in sacrifices.**

4. **Dental Customs:**
    a. The **color of teeth holds a unique significance among the Onge tribe.** They view pearly white teeth as a symbol of death and have a tradition of chewing bark to impart a red color to their teeth.

5. **Body Ornamentation:**
    a. The Onge **people decorate their bodies and faces with white and ochre clay**. Special occasions call for more elaborate body ornamentation.

6. **Historical Presence and Current Interactions:**
    a. **Until the 1940s, the Onge tribe were the sole permanent inhabitants of Goubalambabey** (the Onge name for Little Andaman).
    b. Today, **they share the island with approximately 17,000 settlers from India, Bangladesh, and the Nicobar Islands.**

7. **Population Decline and Conservation Efforts:**
    a. The Onge tribe's population experienced a **significant decline following contact with British colonists and Indian settlers, falling from 670 in 1900 to only 96 members by the early 2000s.**
    b. **In 1976, the Onge tribe was settled in order to provide them with basic facilities for hygienic living and protection against natural elements.**
    c. They now **reside in a reserve in Dugong Creek (Little Andaman),** which is a fraction of the size of their original territory.

8. **Infertility and Challenges:**
    a. The Onge tribe is **also known for having one of the world's lowest fertility rates.**
    b. **Infertility affects more than 40% of married couples within the tribe**, posing a significant challenge to their population growth.

Preserving the Onge tribe's cultural heritage and addressing their unique challenges is **essential for safeguarding the diversity and richness of India's indigenous communities.** Efforts to support their traditional practices, **while also providing access to healthcare and education, are crucial steps towards ensuring the well-being and longevity of the Onge tribe.**

Which tribes live in andaman and nicobar islands?

The Indigenous tribes of the Andaman and Nicobar Islands can be **classified into two distinct racial groups.**

1. The **Negrito group** consists of the Andamanese, **Jarawas, Onges, and Sentinelese, who reside in the Andaman group of islands.**

2. In contrast, the **Mongoloid group includes the Nicobarese and Shompens, who inhabit the Nicobar Islands.**

3. Among these tribes, the **Nicobarese are the only ones not classified as Particularly Vulnerable Tribal Groups (PVTGs),** while the **remaining five tribes hold this designation.**

About Particularly Vulnerable Tribal Groups (PVTGs):

1. Particularly Vulnerable Tribal Groups (PVTGs) are a **sub-classification of Scheduled Tribes that are considered more vulnerable and require special attention for their development.** They were previously known as **Primitive Tribal Groups.**

2. **Characteristics of PVTGs:**

   a. **Homogeneity:** They are **mostly homogenous, with a small population.**

   b. **Isolation:** They are relatively **physically isolated.**

   c. **Social Structure:** Their social institutions are simple and traditional.

   d. **Language:** They **often lack a written language.**

   e. **Vulnerability:** They are **more vulnerable to exploitation**, **displacement**, and **loss of cultural identity.**

Government Initiatives:

1. The Indian government has identified **75 PVTGs across 18 states** and **1 union territory** and has initiated various schemes and programs to address their specific needs and challenges.

2. These initiatives focus on **education, healthcare, livelihood development, land rights, and cultural preservatio**n.

3. The **Ministry of Tribal Affairs administers a scheme specifically for PVTGs called the "Development of Particularly Vulnerable Tribal Groups (PVTGs)."**

4. This scheme aims to plan their **socio-economic development comprehensively** while retaining their unique culture and heritage.

Examples of PVTGs:

1. Some examples of PVTGs include the **Great Andamanese, Jarawas, Onges, and Shom Pens of the Andaman and Nicobar Islands, the Chenchus of Andhra Pradesh, and the Baigas of Chhattisgarh.**

2. Overall, the **PVTG classification is a recognition of the unique vulnerabilities faced by certain tribal groups in India and the need for targeted interventions to ensure their well-being and development.**

8. 300th birth anniversary of the Maratha queen Ahilya Bai Holkar

May 31st marks the 300th birth anniversary of the Maratha queen Ahilya Bai Holkar who was a great administrator and visionary. In all her dealings with her subjects, Ahilya Bai was guided by her innate generosity and principles.

About Ahilyabai Holkar:

1. **Born in 1725**, she was the Rani of Indore (Holkar dynasty) within the Maratha Confederacy.

2. She established **Maheshwar (in Madhya Pradesh) as the seat of the Holkar Dynasty, south of Indore on the Narmada River.**

3. After the demise of her husband (Khande Rao) she was trained in military affairs by Malhar Rao Holkar.

4. She came to power after the passing of her father-in-law Malhar Rao Holkar.

Contributions in Culture:

1. **Ahilyabai funded the reconstruction of the Kashi Vishwanath Temple in Varanasi (1780)** which had been destroyed in the past and subsequently converted into a mosque by Aurangzeb in 1669.

2. The current structure of **Vishnupad Temple, Gaya, Bihar was built by Maharani Ahilya Bai Holkar in 1787.**

3. Ahilya Bai resurrected the jyotirlingas across the country. Renovations in Somnath, Varanasi, Trambak, Gaya, Pushkar, Vrindavan, Nathdwara, Haridwar, Badrinath, Kedarnath and many other sacred sites were undertaken during her reign.

4. The **Maheshwari Sari are also part of the queen's legacy.** She not only promoted the traditional weave but also paved the way for skilling women, thus empowering them. The production of these saris was not only a way to increase the revenue collection of the state, but provided a steady source of income to the weavers. **Under her encouragement, the production of Maheswari saris gained momentum and popularity.**

MARATHA CONFEDERACY
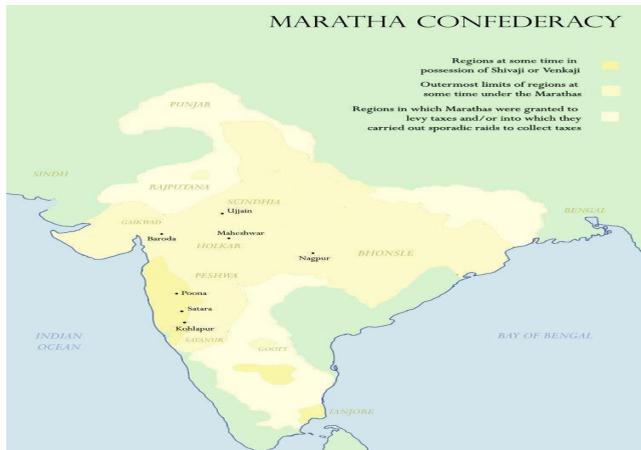
About Holkars of Maratha Confederacy:

1. **The Holkars were Subedar (one of the designations of a governor of a Subah/province)** under Peshwa Baji Rao I (Pune seat).

2. When the Maratha Empire began to weaken due to internal clashes, the Holkars declared themselves the rulers of Indore in Central India, **existing as an autonomous member of the Maratha Empire until 1818.** After this they were **under the protectorate of the British Empire.**

3. The dynasty was founded with **Malhar Rao, who joined the service of the Peshwas of the Maratha Empire in 1721,** and quickly rose to the rank of Subedar.

4. In the 1720s, he led Maratha armies in Malwa region, and in 1733 was granted 9 parganas in the vicinity of Indore by the Peshwa.

5. By the time of his death, he ruled much of Malwa, and was acknowledged as one of the five virtually independent rulers of the Maratha Confederacy.

6. **He was succeeded by Ahilyabai Holkar (his daughter-in-law).**

9. First Evidence Of Rock Art In Mangaluru City

Recently, Archaeologists found the **1st evidence of rock art in Mangaluru City** near Boloor Panne Koteda Babbu Swamy shrine.

a. The rock art has a **pair of human footprints, found on a natural stone boulder near the shrine.**

b. These footprints might have been **made in the 1st or 2nd century AD.**

Rock Art Tradition in India

1. Rock art, including paintings and engravings on natural surfaces such as caves, shelters, and boulders, is a global phenomenon and one of humanity's earliest artistic expressions.

2. **In India, rock art exhibits** remarkable diversity **in both style and subject matter, covering from the Upper Palaeolithic period** to historic times, and even resonating in the artistic traditions of present-day tribal communities.

Rock Art Sites in India

1. **South India:**
   a. **Karnataka:** Kupgal (Sanaganakallu), Badami, Maski, Piklihal, Tekkalakota.
   b. **Andhra Pradesh:** Budagavi, Chintakunta, Kethavaram, Kurnool.
   c. **Tamil Nadu:** Alambadi, Padiyandal.
   d. **Kerala:** Edakkal and Ezhuthupura rock shelters.

2. **Lakhudiyar Rock Shelters, Uttarakhand:**
   a. Notable prehistoric paintings, including scenes of hand-linked dancing human figures.

3. **Vindhyan Region and Satpura Ranges:**
   a. **Bhimbetka (Raisen), Madhya Pradesh:** A **UNESCO World Heritage Site** renowned for its rock shelters.
   b. **Cave (Bhimbetka III F-24) petroglyphs:** The oldest known rock art in the world.

4. **Ajanta Rock Paintings, Maharashtra:**
   a. Primarily depict Buddhist subjects and stories from the Jataka tales.
   b. Late 6th century CE painting of Bodhisattva Padmapani holding a lotus flower.

5. **Ellora Paintings, Maharashtra:**
   a. Hindu, Buddhist, and Jain cave temples from the 8th to 10th centuries CE.
   b. Paintings with sharp features and pointed noses in the Jain caves.

10. PM Modi Meditates at Vivekananda Rock Memorial

In May, 2024 Prime Minister Narendra Modi visited the Vivekananda Rock Memorial in Kanyakumari, Tamil Nadu, and engaged in 45-hour meditation at the site of Swami Vivekananda's enlightenment.

This event highlights the importance of India's spiritual heritage and the enduring legacy of Swami Vivekananda, whose teachings continue to inspire millions worldwide.

Spiritual significance of Vivekananda rock:

1. Located near **Kanyakumari's Vanathurai beach,** at the southernmost tip of mainland India where the **Indian Ocean, Arabian Sea, and Bay of Bengal converge,** Vivekananda Rock holds profound historical and spiritual importance.
2. **In 1892,** according to the disciples of Swami Vivekananda, it was at this place, **he ultimately achieved enlightenment.**

About Swami Vivekananda (1862-1902):

1. Swami Vivekananda (original name was Narendranath Datta), emerged as a prominent **advocate of Ramakrishna's teachings,** adapting them to contemporary Indian society and becoming a significant figure in the propagation of neo-Hinduism.
2. His ideology drew from the spiritual **experiences of Ramakrishna, the teachings of the Upanishads and the Gita, as well as the examples set by Buddha and Jesus**, all forming the foundation of his message on human values.
3. **Central to Vivekananda's philosophy was Vedanta,** which he viewed as **a rational and superior approach to spirituality.**
4. **His mission aimed to bridge the gap between spiritual pursuits and practical life,** advocating for a holistic approach to human existence encompassing **both paramartha (spiritual service) and vyavahara (daily conduct).**

5. Vivekananda stressed the unity of God and humanity, advocating for the integration of Hinduism and Islam in India for the nation's well-being.
6. He emphasized the importance of combining knowledge with action, **criticizing the neglect of social issues by religious institutions and urging Hindus to engage actively in social reform.**
7. At the 1893 Parliament of Religions in Chicago, **Vivekananda highlighted the need for a balanced synthesis of Eastern spiritualism and Western materialism** to foster global happiness and progress.
8. **In 1897 to inspire pride in Indian culture and foster social reform,** he founded the **Ramakrishna Mission,** which has since become a global organization dedicated to humanitarian relief, education, and social service, guided by the principle that service to humanity is akin to worship.
9. **The Ramakrishna Mission, though deeply religious, does not seek to convert;** instead, it embraces universal spiritual values and respects diverse religious practices.
10. **In 1898, Vivekananda established the Ramakrishna Math in Belur (Karnataka).** It was open to all regardless of caste or creed, symbolizing his vision of an inclusive spiritual community committed to service and enlightenment.
11. In 1887, Narendra compiled a **Bengali song anthology named Sangeet Kalpataru** with **Vaishnav Charan Basak.**
12. He also composed **'Khandana Bhava Bandhana'**, a prayer song dedicated to Ramakrishna, in 1898.

11. 106-year-old Maharani Temple: Gulmarg

The **Maharani Temple situated on the beautiful hill of Gulmarg** has sadly fallen prey to a terrible fire.

Historical Significance:

1. **Location:** Situated on a small hill in the **middle of Gulmarg town in Baramulla district of Jammu and Kashmir,** Maharani Temple has immense historical and cultural importance.
2. **Alternative Names:** Also **known as the Rani Temple or Mohineshwar Shivalaya**, this temple is dedicated to **Lord Shiva** and his divine consort, Parvati.

3. **Architectural Heritage: Constructed in 1915 by Mohini Bai Sisodia,** wife of the former ruler of Kashmir, Maharaja Hari Singh, the temple stands as a testament to the **rich heritage of the Dogra dynasty.**

   a. **Maharaja Hari Singh:** Maharaja Sir Hari Singh **(1895 – 1961) was the last ruling Maharaja of the princely state of Jammu and Kashmir.**

   b. He played a significant role in the accession of **Jammu and Kashmir to the Dominion of India in 1947.**

4. **Royal Connection:** Once a **royal temple of the Dogra dynasty**, the Maharani Temple reflects the grandeur of the **erstwhile princely state of Jammu and Kashmir.**

5. **Panoramic Views:** The **strategic location** of the temple allows visitors to enjoy the **breathtaking views of Gulmarg from every corner.**

6. **Architectural Marvel:** The **intricate carvings and designs of the temple display** a beautiful blend of **Indian and Persian architectural styles**, making it an architectural masterpiece.

7. **Religious Harmony:** The **temple is an example of religious harmony**, with **Muslim priests performing the rituals**, which reflects the **peaceful co-existence of different religions in the region.**

Restoration Efforts:

In 2021, the **Indian Army in collaboration** with the **local communities launched a comprehensive restoration project for this 106-year-old temple.** The project **not only included the restoration of the temple** structure but also the redesigning of the pathways leading to the temple.

12. UNESCO's Memory of the World Recognition for Indian Texts

The inclusion of the Ramcharitmanas, Panchatantra, and Sahṛdayāloka-Locana in UNESCO's Memory of the World Asia-Pacific Regional Register marks a significant milestone for India. This recognition celebrates India's profound literary heritage and cultural legacy, underscoring its global importance.

About the Memory of the World Programme:

1. The MoW Programme is an **international initiative launched by UNESCO in 1992** to protect the documentary heritage of humanity.

2. It aims to recognize significant documentary heritage analogous to **UNESCO's World Heritage Convention** and **World Heritage List**, which identify important natural and cultural sites.

3. **The MoW Programme aims to:**

   a. Facilitate the preservation of the **world's documentary heritage**, especially in regions affected by conflict or natural disaster.

   b. **Enable universal access to documentary heritage worldwide.**

   c. **Enhance public awareness about the significance of documentary heritage among the broader public.**

Governance:

1. The International Advisory Committee (IAC) is the primary body responsible for advising UNESCO on the planning and implementation of the MoW Programme.

2. The IAC comprises 14 members serving in a personal capacity, appointed by UNESCO's Director-General and chosen for their authority in the field of documentary heritage.

Nomination for MoW:

1. The call for nominations and inscriptions on the **Asia Pacific Register is made every 2 years** unless unexpected circumstances make this impractical.

2. **Nominations are usually requested in even-number years (to alternate with the International Register).**

India's Three Items Included in MoW:

1. **Ramcharitmanas:**

   a. **Written by Tulsidas in the 16th century.**

   b. Composed in the **Awadhi dialect, spoken primarily in the districts of Lucknow, Prayagraj, and Ayodhya.**

2. **Panchatantra:**

   a. A collection of fables **originally written in Sanskrit.**

   b. Comprises **5 distinct sections, each focused on a specific principle.**

c. Believed to have been written by **Vishnu Sharma.**

3. **Sahṛdayāloka-Locana:**

   a. **A Sanskrit commentary on the Dhvanyaloka.**

13. Musankwa sanyatiensis: A New Dinosaur Species

Fossil remains found on the shores of **Lake Kariba in Zimbabwe have revealed a completely new dinosaur species, Musankwa sanyatiensis.**

About Musankwa sanyatiensis:

1. Musankwa sanyatiensis is a **newly identified dinosaur species based on fossils discovered** along the **shores of Lake Kariba in Zimbabwe.**

2. The genus name "**Musankwa**" was **derived from the name of the houseboat** used by scientists during their research expeditions to the site.

3. The **species name "sanyatiensis" refers to the Sanyati River that flows into Lake Kariba.**

4. Musankwa sanyatiensis represents the **first dinosaur named from the Mid-Zambezi Basin of northern Zimbabwe** in **over 50 years.**

5. It is only the **fourth dinosaur to be named from Zimbabwe, following Syntarsus rhodesiensis, Vulcanodon karibaensis, and Mbiresaurus raathi.**

6. The rocks containing the **Musankwa sanyatiensis specimen date back to the Late Triassic period, approximately 210 million years ago.**

7. Musankwa sanyatiensis is **represented by the remains of a single hind leg, including the thigh, shin, and ankle bones.**

8. Evolutionary analysis suggests that **Musankwa sanyatiensis was a member of the Sauropodomorpha, a group of bipedal, long-necked dinosaurs prevalent during the Late Triassic.**

9. Interestingly, it appears to be closely related to **contemporary dinosaurs found in South Africa and Argentina.**

Additional key points:

1. Musankwa sanyatiensis was a **relatively large dinosaur for its time, weighing around 390 kg.**

2. It was primarily a **plant-eater and likely inhabited swampy areas.**

The Triassic Period:

1. The Triassic Period, the **first of the three geologic periods of the Mesozoic Era, began approximately 252 million years ago and ended about 201 million years ago.**

2. It followed the **Permian extinction, the largest mass extinction in Earth's history**.

3. The name **"Triassic" is derived from the Trias, a sequence of three rock strata in Germany found above Permian rocks** and below **Jurassic rocks.**

4. The **Triassic Period marked the beginning of significant changes, including the rearrangement of continents**, the evolution of life, and the **geographic distribution of living organisms, that would occur throughout the Mesozoic Era.**

14. The 'Air of the Anthropocene' Initiative

The **"Air of the Anthropocene"** project creatively **combines art and science** to visualise air pollution in India, Ethiopia, and the UK.

a. This **initiative aims to raise awareness** about the severe health risks posed by air pollution and spark global discussions on air quality.

About the Initiative:

1. **Artistic Expression:** The **"Air of the Anthropocene"** project utilizes **light painting, a photographic technique, to capture and visualize air pollution.** Artists and researchers collaborate to produce visually striking images that convey the extent and severity of air pollution in different regions.

2. **Scientific Accuracy:** In addition to the artistic aspect, the **project incorporates scientific data collected using low-cost air pollution sensors.** These **sensors measure particulate matter (PM) levels, including PM2.5**, which is considered a significant health hazard.

What is Particulate Matter (PM):
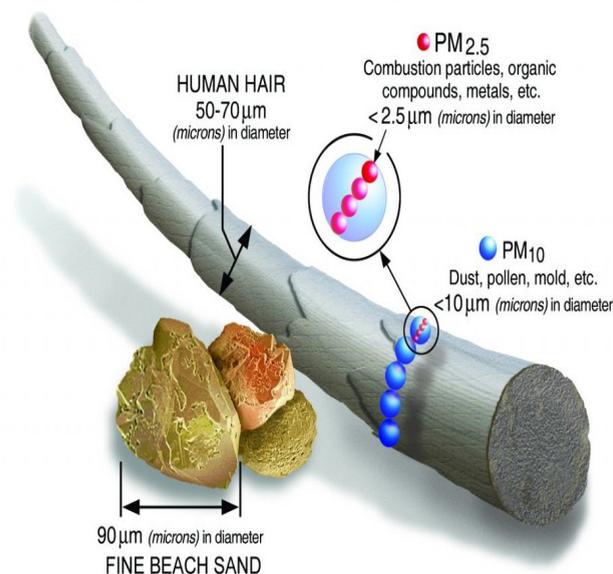
Definition: Particulate matter **(PM) is a complex mixture of solid and liquid particles suspended in the air.** It includes **organic and inorganic particles**, such as **dust, pollen, soot, smoke, and liquid droplets**. PM varies in size, composition, and origin.

Impact of Air Pollution:

1. **Public Health Concerns: PM, particularly PM2.5,** poses severe health risks. It has been linked to an increased incidence of **cardiovascular diseases, stroke, and respiratory issues**, making it a leading cause of morbidity and mortality worldwide.

2. **Global Prevalence:** According to the World Health Organization **(WHO), an estimated 99% of the global population breathes air that exceeds WHO** guideline limits, resulting in **approximately 7 million premature deaths annually attributable to air pollution.**

LEDs (Light Emitting Diodes):

1. **Versatile Technology:** LEDs are **semiconductor devices** that **emit light when an electric current passes through them.** They are used in various applications, including **electronics, lighting, medicine, and data communication.**

2. **Characteristics: LEDs are known for their energy efficiency, long lifespan, and versatility** in terms of color and brightness, making them ideal for light painting in the **"Air of the Anthropocene" project.**

15. 2024 Global Report on Internal Displacement

Recently, **Geneva-based Internal Displacement Monitoring Centre (IDMC) published a report which reveals 69,000 displacements in South Asia due to conflict, with Manipur violence accounting for 67,000.**

1. The **IDMC is a global organization that tracks and reports on internal displacement.**

2. The term **"internal displacement" refers to the forced movement of a person within the borders of a country.**

Global Perspective:

1. **68.3 million displaced by conflict and violence worldwide in 2023.**

2. 22.6 million increase in IDPs **(Internally displaced people)** due to conflict in the past 5 years.

3. **Sudan, DRC, Palestinian territories saw major displacements in 2023.**

4. 75.9 million total IDPs globally (including disasters) at 2023-end.

   a. **Internally displaced people (IDPs) :** Internally displaced people are those who have been forced to flee their homes as a result of conflict, violence, or disasters and who have not crossed an internationally recognized State border.

Key Differences:

Feature	Internally Displaced People (IDPs)	Internal Displacements (Movements)
Focus	Individuals	Events/ Occurrences
What it measures	Number of people displaced	Number of displacement instances
Time frame	Point in time (e.g., end of year)	Cumulative over a period (e.g., year)

Why does the number of IDPs keep increasing?

1. New escalations of conflict such as in Sudan and Palestine forced millions of people to flee in 2023.
2. Earthquakes, storms, floods and wildfires destroyed large numbers of homes, forcing even more people to remain displaced at the end of the year.
3. In the absence of durable solutions to displacement, the number will likely continue to rise.

Key Points:

1. The report by the IDMC termed it the **highest number of displacements triggered by conflict and violence in India since 2018.**
2. Last year, On May 3, 2023, a **'Tribal Solidarity March'** in the hill districts of Manipur led to **ethnic clashes between the Meitei and Kuki communities**, resulting in the l**oss of more than 200 lives.**
   - The Manipur High Court had called for recommendations for **recognizing the Meitei community as a "Scheduled Tribe"**, which had faced **opposition from other local STs, including the Kukis.**
   - More than **three-quarters of the movements took place within Manipur**, but about one-fifth took place in the neighbouring state of Mizoram and smaller numbers in Nagaland and Assam.
3. **At the end of 2023, there were 0.61 million internally displaced persons in India.**

Manipur's Displacement Crisis:

1. In 2023, Manipur experienced internal displacement, accounting for 97% of all such cases in South Asia.
2. This means that **67,000 people out of a total of 69,000 people in the entire region were displaced from their homes within the state.**

The Spark that Ignited the Crisis

1. The root of the crisis lies in the ethnic clashes that broke out between the **Meitei and Kuki** communities following the **'Tribal Solidarity March' on May 3, 2023.**
2. The **march was organised in protest against the Meitei community's demand for Scheduled Tribe (ST) status.**
3. **A designation intended to protect marginalised groups.**
4. However, this **demand faced resistance from other local STs, including the Kukis, who feared losing their existing benefits and rights.**

5. The **tension had further increased due to a land dispute between the two communities.**
6. The violence that followed quickly spread to several districts including **Churachandpur, Imphal East, Imphal West, Bishnupur, Tengnoupal and Kangpokpi.**
7. This caused widespread **fear and panic, forcing thousands of people to flee their homes in search of safety.**

Government Response:

1. In response to the increasing violence, the Indian government implemented a number of measures aimed at restoring order and providing assistance to the displaced.
2. These measures included **imposing curfews, shutting down the internet, and deploying security forces**.
3. Additionally, the government established relief camps to provide temporary shelter and basic needs to those who had lost their homes.
4. A **peace committee was also established to facilitate dialogue between the conflicting communities and find a peaceful solution to the crisis.**
5. However, the committee **faced challenges due to disagreements over its structure and lack of trust between communities.**
6. As a result, **its effectiveness in restoring peace and facilitating the return of displaced persons has been limited.**

The Road to Recovery:

The road to reform for Manipur is challenging, with immediate needs such as shelter, food, water, and healthcare for the displaced. Long-term consequences like psychological trauma and disrupted education also require attention. **Restoring peace and security is important for the safe return of displaced persons, involving addressing grievances and resolving land disputes.**

1. The **government should invest in infrastructure and economic opportunities to support recovery.** The international community can provide financial and technical support for relief and rehabilitation efforts and promote dialogue and reconciliation.
2. The displacement crisis in Manipur emphasizes the need for addressing the root causes of violence and having early warning systems and preparedness measures to prevent future displacement crises.

H. ETHICS

1. Ethical Use of Social Media Platforms

Recently, the Election Commission of India (ECI) has noticed violations of the Model Code of Conduct and other legal provisions regarding the use of social media in election campaigning by political parties. This highlights the lack of well-defined social media ethics in the rapidly changing landscape of social media.

Ethical Concerns Regarding Social Media

1. **Individuals v/s Social media platforms:**
   a. **Privacy concerns** arise due to platforms collecting and using data to enhance user experience without clear consent for how personal data is stored and shared, raising ethical issues of confidentiality breaches. For example, targeted advertising and doxxing illustrate these concerns. The distinction between **public and private information** is often unclear, creating dilemmas such as media roles and celebrities' struggles with privacy on social media.
   b. **Discrimination** on social media platforms is evident as they enable widespread participation but lack structures to ensure equitable access for marginalized groups. For instance, social media campaigns promoting **anti-immigration sentiments** in Western countries highlight these inequalities.
   c. **Fake news** on social media is exacerbated by the absence of robust verification processes and accountability, often stemming from the platform's anonymity feature. This contributes to the rampant spread of misinformation, intentional or unintentional, which undermines effective decision-making. For example, during the COVID-19 pandemic, **misinformation about vaccines** greatly affected public perception and hindered government efforts to combat the virus.

2. **Society v/s social media platforms:**
   a. **Division on social media** occurs when individuals segregate into groups that share their views, creating 'echo chambers' and 'filter bubbles.' This means they only hear similar opinions and ignore different ones. For example, **Facebook was used** to **stir up violence** against the Rohingya in Myanmar and to divide people based on race, religion, and caste.
   b. **Erosion of Boundaries** Between Public and Private: Social media platforms have blurred the line between what is public and what is private in our lives. Example: The use of mobile phones during family dinners has disrupted family interactions, isolating children from family bonding moments.

3. **Regulatory ecosystem v/s Social media platforms:**
   a. **National Interest vs. Individual Freedom**: Governments prioritize content moderation to safeguard national security and dignity, while platforms argue it restricts users' freedom of speech.
   b. **Ethical Responsibility of Platforms**: Should platforms prioritize finding morally acceptable solutions, even if it risks their business model?
   c. **Transparency and Accountability**: Challenges in holding platforms accountable for content and the complexity of tracing its origins reduce transparency and trust in the system. Example: WhatsApp's end-to-end encryption complicates efforts to track criminal activities on the platform.

> *"I think there should be regulations on social media to the degree that it negatively affects the public good. We can't have like willy-nilly proliferation of fake news, that's crazy." - Elon Musk*

What are the principles for an ethical social media?

1. On social media platforms, critical thinking is essential to combat the "**Spiral of Silence**" effect.

2. This phenomenon describes how people's **fear of isolation** silences their opinions on important political and civic issues.

3. Essentially, we subconsciously gauge the **popularity of an opinion** and are less likely to voice a view we perceive as unpopular.

4. This dynamic can distort **public discourse**, amplifying popular (but not necessarily accurate) opinions while silencing valuable dissent.

Way Forward

1. Social media ethics are tricky. Regulations can **stifle innovation**, but without them, who protects users? Frameworks like **India's 2021 rules** try to find a middle ground. They hold **platforms accountable** (think grievance officers) while letting them set their own rules (with some government oversight). This aims to **balance user safety** with platform freedom.

2. Social media platforms **walk a tightrope** between protecting users and stifling expression. Striking the right balance is key to maintaining trust. This can involve:

   a. Following **government guidelines** on data (think national security)

   b. **Voluntary industry** codes (like the election code) for specific situations

3. For a healthy democracy, **responsible social media use** during elections is crucial. Political parties should have strong internal guidelines and a code of ethics to promote ethical conduct online. This self-regulation will ensure a fair and trustworthy electoral process.

4. Holding social media platforms accountable for ethical behaviour is a **collective responsibility** we all share. Working together, we can make them more accountable and create a healthier online environment.

5. Social media thrives on **responsible users**. Let's all be mindful of the risks and ethical considerations to make it a positive experience for everyone.

The rise of user empowerment is evident in initiatives like Apple's iOS 14.5 opt-in for ad tracking and platforms like X's (Twitter) Civic Integrity Policy. By following suit and using social media thoughtfully, we can collectively foster a safer and more positive online space.

2. Compassionate Capitalism

Recently, **Narayana Murthy** raised concerns about the big **difference in income** between top executives and lower-level employees in Indian companies. He suggested practising compassionate capitalism to solve these issues.

A report from the **Wealth Inequality Lab** found that in India, the richest 1% of people earned 22.6% of the country's income in 2022-23.

There were also reports that **Amazon warehouse workers** were not allowed bathroom breaks or water until they met their daily work quotas.

These examples show why we need to **rethink traditional capitalist practices**.

> *"It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest."*
> — *Adam Smith*

What is Capitalism?

1. Capitalism is an **economic system** where private individuals own and manage property based on their own goals.

   a. Prices in markets are determined freely by **supply and demand**, which ideally benefits society as a whole.

   b. Adam Smith's "**The Wealth of Nations**" established the fundamental principles of capitalism.

   c. According to Smith, in voluntary exchanges, both parties pursue their interests, but they must also consider the desires of the other party to achieve their own goals.

   d. This rational pursuit of **self-interest** drives economic growth and prosperity.

What is Compassionate Capitalism?

1. Compassionate capitalism seeks to **combine capitalist opportunities** with fair distribution of wealth inspired by **socialist ideas**.

2. Compassionate capitalism integrates **Adam Smith's** focus on individual economic initiative with **Karl Marx's** principles of equitable wealth distribution.

3. It blends the ideals of communism's fair wealth sharing with concepts like work ethics, opportunities, and just economic rewards.

4. Compassionate Capitalism is about ensuring **everyone has fair access** to abundant economic opportunities and supporting others to achieve personal and collective benefits through this process.

Difference between Capitalism and Compassionate Capitalism

Capitalism	Compassionate Capitalism
Concentration of Wealth (perpetuates in equality)	Redistribution of Wealth
Profit to the Business	Profit to all Stakeholders
Exploitation of Resources	Sustainable use of Resources
No accountability towards society	Accountability to society for their decisions and actions

Contribution of Moral Thinkers to the Idea of Compassionate Capitalism

Various moral philosophers have laid the foundations for compassionate capitalism. These philosophies emphasise **human dignity, societal welfare, and environmental sustainability**, aligning with compassionate capitalism's goal of balancing financial success with ethical responsibility to stakeholders.

1. **Buddhism's Pratityasamutpada**: Based on dependent origination, this view holds that people are interconnected with each other and the Earth. It promotes shared prosperity in a sustainable world with minimal suffering.

2. **Immanuel Kant's Categorical Imperative**: Kant emphasized treating every person as an end in themselves, not merely as a means. His moral law dictates acting out of duty to ethical rules, not mere self-interest.

3. **Gandhian Thought**: Gandhi's principles of truth, non-violence, and socio-economic ideals include simple living, uplifting all (Sarvodaya), and trusteeship.

4. **Amartya Sen's Capability Approach**: Sen's framework evaluates individual well-being and social policies based on people's capabilities and freedoms, not just monetary metrics. This approach provides an alternative to pure profit-driven models.

> *"From each according to his ability, to each according to his needs". — Karl Marx*

Practices that make Capitalism Compassionate towards various stakeholders

1. **Workers:**
   a. **Open and flexible work cultures** promote collaboration, innovation, and creativity while investing in skill development to enhance workers' capabilities.
   b. **Equal opportunity** for growth can be seen in initiatives like Infosys' Employee Stock Ownership Plan (ESOP), which democratizes wealth by granting company stock to employees.
   c. Financial security and fair **wealth redistribution** are exemplified by Tata Steel's commitment to pay the families of employees who died from COVID-19 their last drawn salary until the deceased would have turned 60.
   d. Compassionate leadership fosters values like **empathy, openness and communication**, physical and mental well-being, inclusiveness, and integrity in leadership.

2. **Environment:**
   a. **Environmental accounting** involves including environmental and ecological damages in the cost of doing business.
   b. For example, in 2012, SEBI issued a guidance note on **environmental, Social, and Governance** (ESG) disclosures, requiring companies listed on Indian stock exchanges to report their ESG performance in annual reports.
   c. Reducing pollution efforts include initiatives like the **carbon action initiative**, which focuses on high greenhouse gas emission companies.
   d. Adopting a **circular economic model**, such as the one implemented by ITC, helps reduce environmental footprints while achieving greater efficiency and cost savings.
   e. Minimizing consumerism is based on the "**Limits to Growth**" principle proposed by the Club of Rome, which suggests that humans can live sustainably on Earth by limiting the production and consumption of material goods.

3. Society:

   a. Corporate Social Responsibility (CSR) is a commitment by businesses to integrate social and environmental concerns into their operations.

   b. In India, CSR is also a **legal requirement** under Section 135 of the Companies Act, 2013, and the Companies (CSR Policy) Rules, 2014.

   c. Redistribution of wealth generated from development can be seen in initiatives like the Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY), which ensures that the benefits of development reach the people and areas affected by mining.

   d. Addressing **societal needs** is another aspect, exemplified by the 'Goodfellows' initiative, which helps the elderly in India, catering to the country's ageing population.

Ethical dilemma associated with compassionate capitalism

1. Balancing **employee welfare and profit maximization** involves ensuring fair wages, reasonable working hours, and good working conditions, which may increase operational costs and potentially reduce profits.

2. Focusing on **consumer interests** by producing higher-quality, safer products may result in higher costs and impact profit margins.

3. Balancing **environmental responsibility** with cost efficiency can be challenging, as eco-friendly initiatives might increase expenses and affect competitive pricing and profitability.

4. Offering **competitive compensation packages** to attract top talent can create a significant income gap between the highest and lowest earners.

5. Investing in **community projects** and social causes can enhance a company's social responsibility image but might not provide immediate financial returns to shareholders.

Way Ahead

1. Business is a **dominant force** globally, crossing national and international borders and operating beyond financial, political, cultural, ethnic, or religious constraints.

2. As such, it holds a **moral responsibility** to positively influence and support everything it impacts.

3. The true purpose of business should be to enhance the **quality of life**.

4. **Traditional capitalism**, however, often falls short of this goal, making a shift towards compassionate capitalism necessary.

5. This concept aligns with principles embedded in the Indian Constitution, specifically **Article 38 and Article 39(C)**, which urge the state to reduce income inequality and prevent the concentration of wealth.

3. Ethics of Punishment

The **Pune accident** involving a teenager from an influential family, driving a luxury car resulting in the death of two individuals, has sparked ethical concerns over **disparities in punishment**.

Despite the severity of the incident, the Juvenile Justice Board's decision to grant bail and impose a **lenient penalty** has raised questions about fairness and equity in the justice system.

> "*If he who breaks the law is not punished, he who obeys it is cheated. This, and this alone, is why lawbreakers ought to be punished: to authenticate as good, and to encourage useful, law-abiding behaviour. The aim of criminal law cannot be correction or deterrence; it can only be the maintenance of the legal order.*" -*Thomas Szasz*

Philosophies of Punishment

1. **Deterrence theory** says that punishing people can stop others from committing crimes. **General deterrence** aims to prevent crime by scaring the public, while **specific deterrence** tries to stop people who have already been punished from committing crimes again.

   a. But giving very **harsh punishments**, could **overshadow efforts** to help people change their behaviour and make things right again through rehabilitation and restorative justice.

2. **Incapacitation theory** says we should **keep offenders away from society** to stop them from committing more crimes. Prisons are where we isolate offenders to protect the public and prevent crimes. The most serious form of this is capital punishment.

   a. But this idea raises concerns. People **worry about human rights**, whether they could be abused, and if keeping someone in prison for a long time stops them from committing more crimes.

3. **Retribution** means punishment should **match the severity of the offence**, aiming to balance the scales of justice rather than just prevent crime, as outlined in the Indian Penal Code.

   a. But retribution is **criticized for being too strict**, disproportionate, and not effective in changing how society behaves.

4. **Restorative Justice** focuses on **repairing the harm done to victims** and communities by offenders through punishment.

   a. But it may **not be appropriate for all crimes** or offenders, and victims may not always perceive it as fair.

5. **Rehabilitation** aims to **help individuals** who have committed crimes change their behaviour through interventions like **therapy and education**, enabling their reintegration into society.

   a. But challenges such as financial constraints, **public support** for tougher sentences, and a focus on crime control rather than prevention can hinder support for rehabilitation programs.

Ethical Concerns in the Indian Punishment System

1. The legal system is seen as **unfair to the poor** and marginalized who often can't afford legal representation.

2. Data shows a higher number of **undertrial prisoners** come from **Scheduled Castes** (SC) and **Scheduled Tribes** (ST) communities.

3. **Corruption** in the **legal system** means that sometimes people who are supposed to uphold justice take bribes or do unethical things.

   a. This can lead to **cases not being handled fairly** or quickly, which affects how justice is delivered to people.

4. In India, **cultural norms** sometimes prioritize **reconciliation and forgiveness** over strict punishment for offenders, reflecting values of tolerance and compassion.

   a. But this approach can lead to **challenges in maintaining social order** when offenders are not held fully accountable, potentially undermining deterrence and public trust in the justice system.

5. In some legal systems, **sentencing lacks clear rules or guidelines** for judges to follow when deciding how to punish someone for committing a crime.

   a. This can result in different judges giving **different punishments for the same crime**, which may seem unfair or inconsistent to people.

6. Debates surrounding the **death penalty** often focus on fundamental issues such as whether it respects the **right to life**, whether it evokes empathy for those facing execution, and the moral values society upholds regarding the taking of human life as a form of punishment.

   a. These discussions delve into **ethical dilemmas** and societal values regarding justice and human rights.

7. **Custodial torture** refers to the physical or psychological abuse inflicted on individuals who are detained by law enforcement or awaiting trial. It violates the fundamental principle that individuals are presumed innocent until proven guilty in a court of law.

   a. Such acts of torture undermine the **right to dignity** of the accused, as they are subjected to mistreatment while under the custody of authorities.

8. The **disparity in punishments** for different offences under Indian law, can sometimes appear arbitrary or disproportionate.

   a. In India, the **offence of assault** or using criminal force can result in a relatively **short prison term**, typically around three months.

   b. On the other hand, the offence of **flying a kite dangerously** can lead to a much **longer prison term**, up to two years.

> *Punishment is the last and least effective instrument in the hands of the legislature for the prevention of crime - John Ruskin*

What could be done?

1. A **clear sentencing policy** is essential to ensure consistency and fairness in how punishments are determined for crimes.

   a. The Supreme Court has emphasized that judges should not have unrestricted discretion in sentencing but should **follow guidelines** to ensure that sentences are based on established **legal principles and societal norms**, rather than solely on personal judgment.

2. **Justified punishment** means showing that a crime deserves a punishment that's fair and necessary.

   a. It involves deciding if the **benefits of giving a punishment**, like keeping society safe, are **more important than any negative effects** it might have, such as the impact on the offender's life and future opportunities.

3. Ensuring that **punishments are fair and balanced** about the severity of the crime committed. For example, minor offences should not result in disproportionately harsh penalties.

   a. Establishing **uniform guidelines** so that similar crimes receive similar punishments across different cases and jurisdictions. This helps in promoting fairness and predictability in the legal system.

4. Before passing laws, it's important to **assess** whether they can be effectively **enforced** and implemented in **real-life situations**.

   a. Lawmakers should **evaluate how new laws will affect** people and society to ensure they are fair and reasonable and achieve their intended goals while avoiding unintended negative consequences.

5. **Rehabilitation** aims to address the root causes of **criminal behaviour** and help offenders reintegrate into society.

   a. By focusing on **education, therapy**, and skills training, rehabilitation seeks to reduce offence rates and offer offenders a chance to lead law-abiding lives after serving their sentences.

4. Ethics and Entrepreneurship

Big business award time in India! A group recently met to pick the winners for a "**40 Under Forty**" list, honouring the country's most impressive young business leaders. This year marks the **10th anniversary of the award**, and according to a judge, they're looking for more than just business skills - they want leaders who give back to society too.

> *"If ethics is poor at the top, that behaviour is copied down throughout the organization." — Robert Noyce*

Stakeholders and their Interests

1. **Entrepreneurs:** A winning business plan isn't just about how you make **money**. It also needs buy-in from your team and plays by the rules. This means having a happy, skilled workforce and working well with regulators to keep things running smoothly.

2. **Customer:** Products and services should be **accessible** without breaking the bank, while also being kind to the environment. This means entrepreneurs need to operate with high **ethical standards**.

3. **Government/Regulatory Authorities:** To cultivate successful businesses, we need to foster a **positive environment for entrepreneurs**. This will help them turn their ideas into thriving ventures. Entrepreneurs need to operate within the legal framework (comply with the law of the land) to ensure their businesses run smoothly and ethically.

4. **Employees:** A thriving entrepreneurial ecosystem requires a **work environment** that fosters respect, minimizes office politics, and empowers founders with the resources and support to turn their ideas into ethical, sustainable businesses.

5. **Business Partners/Dealers:** To ensure **long-term success**, entrepreneurs must not only sign deals but also faithfully implement them (in letter and spirit). This requires transparency in daily operations and a strong emphasis on accountability from everyone in the company.

6. **Investors:** Investors, of course, seek **high returns on their investments**. That's a given. But the best ones also prioritize backing honest and accountable entrepreneurs who can build sustainable business models. This creates a win-win situation where everyone benefits.

7. **Community/ Non-Governmental Organization (NGO):** Successful entrepreneurs are increasingly expected to **balance profitability** with a focus on social responsibility and environmental impact. This means creating businesses that are good for the world, not just the bottom line.

Ethical Issues Faced by Entrepreneurs

1. **Profit vs. Social Impact**: Companies can struggle to prioritize both social good and financial gain. For instance, Byju's aggressive expansion might have compromised its financial health.

2. **Environmental Responsibility**: Businesses often prioritize short-term profits over long-term environmental sustainability. Reliance Industries' fine is a stark reminder of the potential consequences.

3. **Ethical Conduct**: The pressure to succeed can sometimes lead entrepreneurs down a dark path, exemplified by the Satyam scandal where financial statements were manipulated. Additionally, cutting corners on IPR can damage innovation.

4. **Employee Wellbeing**: Pushing employees too hard can lead to burnout and a toxic work environment.

> *"Businesses need to go beyond the interest of their companies to the communities they serve."*
> *— Ratan Tata*

Ethical Entrepreneurship: Doing Well by Doing Good

Ethical Entrepreneurship goes beyond just turning a profit. It's about **building successful businesses** that prioritize:

1. **Social Responsibility**: Creating positive impacts on society and communities.

2. **Environmental Sustainability**: Minimizing environmental harm and promoting eco-friendly practices.

3. **Profitability**: Ensuring financial health and growth for the business.

4. This triple-bottom-line approach fosters long-term success.

Key Principles:

1. **Ethical Conduct**: Following high moral standards and adhering to regulations.

2. **Transparency**: Open and honest communication with all stakeholders.

3. **Accountability**: Taking responsibility for decisions and actions.

4. **Corporate Governance**: Implementing good decision-making processes that consider the interests of all stakeholders (shareholders, employees, suppliers, customers, and the community).

Benefits:

1. **Stronger Brand Reputation**: Consumers increasingly value ethical practices, leading to higher trust and loyalty.

2. **Sustainable Growth**: Ethical businesses are better positioned for long-term success by mitigating risks and attracting responsible investors.

3. **Positive Impact**: Ethical entrepreneurship can create a ripple effect of positive change on society and the environment.

Ways to Integrate Ethical Principles into Entrepreneurship

1. Ethical entrepreneurship bridges the gap between **financial success** and **social good**. It's about:

   a. **Social Impact**: Addressing social needs and creating a positive societal impact. (e.g., eHealthPoint providing healthcare in remote areas)

   b. **Profitability**: Generating enough revenue to sustain the business and its mission.

2. Building an Ethical Framework:

   a. **Stakeholder Engagement**: Open communication with employees, customers, and communities is essential. Encourage them to voice concerns about ethical practices. (e.g., TATA Steel's stakeholder engagement process)

   b. **Whistleblower Programs**: Provide safe channels for employees to report misconduct anonymously.

   c. **Ethical Sourcing**: Source raw materials responsibly to avoid exploitation in the supply chain. (e.g., Ben & Jerry's commitment to ethical ingredients)

   d. **Ethical Leadership**: Entrepreneurs set the tone. Their commitment to ethical conduct inspires others. (e.g., Wipro's contribution during the COVID-19 pandemic)

   e. **Transparency & Accountability**: Be open about business practices, impact metrics, and sustainability goals. This builds trust and fosters informed decision-making.

   f. **Code of Ethics**: Establish a clear set of principles and standards that guide ethical behaviour within the organization. (e.g., Raymond's Code of Conduct and Ethics)

India's entrepreneurial boom focuses on a **key approach**: maintaining a balance between profit-making and creating a positive social impact. While initial costs for compliance and process changes might be higher, this approach fosters sustainable development in the long run.

I. ESSAY

Application Of Science and Technology for Women's Empowerment

Introduction

The renowned physicist **Marie Curie** aptly stated, *"One never notices what has been done; one can only see what remains to be done."*

This quote highlights the ongoing need to **strive for progress**, particularly regarding women's empowerment. While advancements have been made, significant work remains to create a truly equitable world. This essay will explore how Science and Technology (S&T) applications can empower women across various spheres, bridging the gender gap and fostering a more inclusive future.

Education and Skill Development: Breaking Down Barriers

Historically, access to education has been a significant barrier to women's empowerment. However, S&T advancements are revolutionizing this landscape. **Online learning platforms**, like Khan Academy and Coursera, transcend geographical limitations, providing **women in remote areas** with flexible educational opportunities. Platforms like Udacity and Udemy offer vocational training programs in diverse fields, empowering women with marketable skills that can enhance their economic independence.

The transformative power of S&T in education is exemplified by organizations like the **African Virtual University** (AVU). Founded in 1997, the AVU utilizes **online learning** to provide higher education opportunities for women across Africa, particularly in underserved regions. This initiative empowers women to pursue careers in fields traditionally dominated by men, such as information technology and engineering.

Healthcare and Well-being: Taking Control

S&T advancements significantly contribute to improved **healthcare for women**. **Telemedicine**, which utilizes telecommunications technology for remote consultations, is a game-changer. Platforms like **Teladoc and Doctor on Demand** connect women with specialists, especially in rural areas where access to advanced healthcare is limited. Mobile health applications like **Flo and Clue** provide vital information on reproductive health, nutrition, and disease prevention, empowering women to make informed decisions about their well-being.

Furthermore, **wearable health monitors** like Fitbit and Apple Watch track vital signs and physical activity, allowing women to take charge of their health. Innovations in medical technology, such as minimally invasive surgical procedures, coupled with advancements in prenatal and postnatal care, contribute to improved maternal health outcomes. As **Ruth Bader Ginsburg**, the iconic Supreme Court Justice, once remarked, *"The decisions of the United States Supreme Court can determine whether women can control their bodies and their destinies."* This quote emphasizes the importance of bodily autonomy for women, and S&T empowers them with the knowledge and tools to make informed choices about their health.

Economic Participation and Entrepreneurship: Leveling the Playing Field

S&T plays a crucial role in promoting women's **economic participation**. Digital platforms like **Etsy** and **Shopify** facilitate online businesses and **e-commerce**, enabling women entrepreneurs to reach wider markets and compete globally. Initiatives like SheTrades, a World Trade Organization (WTO) program, utilize online platforms to connect women-owned businesses with international buyers, fostering economic empowerment.

Technology tools like mobile banking and digital financial services, pioneered by institutions like **M-Pesa** in Kenya, **empower women** with greater control over their finances. This financial independence can be a transformative force, allowing women to **invest in businesses**, support their families, and break free from cycles of poverty. Moreover, S&T advancements in agriculture, such as precision farming techniques and weather monitoring apps, can equip women farmers with tools for improved yields, better resource management, and access to markets. This fosters **economic empowerment for women** in rural communities, who are often the backbone of agricultural production.

Social Inclusion and Safety: Building a Support System

S&T is a powerful tool for promoting women's safety and social inclusion. Mobile applications like **Saftey App** (India) and **bSafe** (global) provide **emergency alert systems** and connect women with support networks in times of distress. Social media platforms, while often fraught with challenges, can be leveraged to raise

awareness about **gender-based violence** and empower women to speak up against injustice. Campaigns like #MeToo, which **utilized social media** to expose and challenge sexual harassment, demonstrate the power of technology in fostering collective action and promoting social change.

Furthermore, technological advancements in areas like **assistive technology** can significantly impact the lives of women with disabilities. Text-to-speech software, screen readers, and voice-activated interfaces empower women with disabilities to access information, communicate effectively, and participate actively in society. As **Helen Keller**, a champion for disability rights, once stated, *"Life is either a daring adventure or nothing at all."* This quote embodies the courage and determination required for people with disabilities to live fulfilling lives. **S&T empowers women with disabilities** to embrace the adventure of life on their terms.

Challenges and Considerations

Despite the vast potential of S&T for women's empowerment, significant challenges remain. The **"digital divide"** persists, with women in developing countries often lacking access to technology or the skills to utilize it effectively. Moreover, cultural barriers and social norms can hinder women's participation in STEM fields (Science, Technology, Engineering, and Mathematics), limiting their participation

Addressing these challenges requires a **multi-pronged approach**. Governments, NGOs, and the private sector must collaborate to bridge the digital divide. Initiatives like community technology centres, digital literacy programs, and affordable internet access plans are crucial to ensure equitable access to S&T resources for all women.

Furthermore, promoting **STEM education for girls** from a young age is essential. Programs like Girls Who Code and Black Girls CODE provide girls with hands-on learning experiences, mentorship opportunities, and role models in the tech industry. By fostering a culture of STEM education for girls, we can **dismantle stereotypes** and encourage more women to pursue careers in technology, shaping the future of S&T and closing the gender gap in these fields.

Empowering Women, Empowering Society

The empowerment of women is not just a moral imperative; it's a **strategic investment** in a nation's future. As the World Bank aptly states, *"Educated girls contribute to economic growth, reduce poverty, and improve the health and well-being of families and communities."* When women are empowered with knowledge, skills, and economic independence, they are better equipped to contribute to their communities and drive societal progress.

Examples of Success: Inspiring Stories of Change

Several inspiring examples illustrate the transformative impact of S&T on women's empowerment. **Dr. Aasha Patel**, an Indian physician, utilizes telemedicine to provide remote healthcare consultations to women in rural communities, bridging the geographical gap to quality medical care. In Rwanda, the "Inyenyeri Women's Initiative" empowers women with skills in drone technology, enabling them to collect and analyze aerial data for crop monitoring and resource management. These examples showcase the power of S&T to equip women with unique skills and disrupt traditional gender roles.

Ethical Considerations and Sustainable Practices

While S&T offers immense potential for women's empowerment, ethical considerations and sustainable practices are paramount. **Algorithmic bias** in technology can perpetuate existing gender stereotypes and limit opportunities for women. For instance, biased recruitment algorithms might **favour male candidates** based on historical hiring patterns. It's crucial to develop and implement inclusive technological solutions that consider the specific needs and experiences of women.

Furthermore, the **environmental impact of technology production** and use cannot be ignored. E-waste, generated from discarded electronics, poses a significant environmental hazard. Sustainable practices in technology development and responsible disposal of e-waste are essential to ensure that S&T empowers women without jeopardizing the environment for future generations.

By promoting ethical considerations and **integrating sustainability practices**, we can harness the power of S&T for women's empowerment in a way that safeguards the well-being of both people and the planet.

Conclusion: A Vision for the Future

The future of women's empowerment is intricately linked to the responsible and **inclusive application of S&T**. By addressing the digital divide, promoting STEM education, and fostering supportive ecosystems, we can unlock the full potential of technology to empower women across all spheres. As **Malala Yousafzai**, the Pakistani activist for female education, eloquently stated, *"One child, one teacher, one book, and one pen can change the world."* In the context of women's empowerment, S&T can be that powerful "pen," enabling women to write their own stories of success and contribute to a more just and equitable world.

J. SCHEME

1. AMRUT Scheme

Ian May 2024, it was reported that India continues to urbanise at a rapid pace, with projections showing that more than 50% of the population will reside in cities by 2047. Schemes such as AMRUT are working to make this urbanisation more sustainable.

About AMRUT Yojana

1. **AMRUT (Atal Mission for Rejuvenation and Urban Transformation)** is a flagship programme launched in June 2015.

2. **The primary goals of the AMRUT Yojana are:**

   a) To provide reliable supply of tap water, as well as sewerage connections, to every household.

   b) To improve urban living through the development of green spaces such as parks.

   c) To reduce pollution by promoting the use of facilities for public transport and non-motorised transport.

About AMRUT 2.0

1. **Launched** in 2021 for the period 2021-2022 to 2025-2026

2. **Objective:** It aims to ensure universal water supply through functional tap connections and improve sewerage/septage management in over 500 cities.

3. **Features of AMRUT 2.0:**

   a) **Universal Coverage:** It aims to provide functional tap connections to all households in statutory towns.

   b) **Circular Economy of Water:** It encourages recycling and reuse of treated sewage, rejuvenation of water bodies and water conservation through development of City Water Balance Plan (CWBP) for each city.

4. **Mission Components:**

   a) **Pey Jal Survekshan:** Assesses equitable water distribution, wastewater reuse and water body mapping to promote competitiveness among cities.

   b) **Technology Sub-Mission:** Integrates global water technologies.

   c) **IEC Campaign:** Promotes water conservation awareness.

   d) **Improving ease of living** includes reducing non-revenue water, recycling treated water, and enhancing urban planning and finance systems.

Performance of AMRUT Yojana

Achievements include 58,66,237 tap connections and 37,49,467 sewerage connections. 2,411 parks have been developed under the scheme and 62,78,571 street lights have been replaced with LED lights.

Challenges of AMRUT Yojana

1. **Lack of infrastructure:** Many urban households still lack piped water and proper sewerage, with water supply at 69.25 litres per capita per day, far below the required 135 litres.

2. **Water management:** Issues include overuse and depletion of groundwater, which is further aggravated by poor sewage treatment and climate variability.

3. **Project execution:** Implementation often suffers from lack of comprehensive strategies and limited involvement of local government.

2. Pradhan Mantri Kisan Samman Nidhi Scheme (PM-KISAN)

Recently, around 1.16 lakh farmers have voluntarily given up the benefits of the Pradhan Mantri Kisan Samman Nidhi Scheme (PMKISAN).

Objective:

To supplement the financial needs of all eligible landholding farmers' families in procuring various inputs to ensure proper crop health and appropriate yields, commensurate with the anticipated farm income as well as for domestic needs.

Launched in 2019, the Scheme initially provided income support to all Small and Marginal Farmers' families across the country, holding cultivable land up to 2 hectares. Its ambit was later expanded to cover all farmer families in the country irrespective of the size of their land holdings.

Ministry: Ministry of Agriculture & Farmers Welfare.

Type: Central Sector Schemes

Benefits: An amount of Rs.6000/- per year is released by the Central Government in three equal instalments of ₹ 2,000 each, every four months to the eligible farmers families.

Beneficiaries: All the landholding farmers' families i.e., husband, wife and minor children) subject to certain exclusions.

Excluded from the scheme:

1. Institutional land holders,
2. Farmer families holding constitutional posts,
3. Serving or retired officers and employees of state/ central government as well as PSUs and government autonomous bodies.
4. Professionals like doctors, engineers and lawyers as well as retired pensioners with a monthly pension of over Rs 10,000 and those who paid income tax in the last assessment year.

Identification of beneficiary:

It is the responsibility of state/UT government.

Facility of Kisan Credit Cards (KCC):

KCC is to be given to All PM-KISAN beneficiaries to provide them with short-term loans for crop and animal/ fish rearing at a maximum interest of 4% on timely repayment.

Project Management Unit (PMU):

Established at the **Central level,** PMU is responsible for the overall monitoring of the scheme. **State Governments** may also consider setting up a dedicated PMU.

UPSC PRELIMS 2024 (16 JUNE)

Answers with Explanation
(GS Paper-1) SET-D

Q.1 How many Delimitation Commissions have been constituted by the Government of India till December 2023?

(a) One   (b) Two

(c) Three   (d) Four

Ans. D

Explanation

1) **Delimitation Commissions have been set up four times in India: 1952, 1963, 1973 and 2002**

2) These commissions were established under Delimitation Commission Acts enacted after each census to redraw the boundaries of constituencies based on the changing population.

Q.2 The Constitution (71st Amendment) Act, 1992 amends the Eighth Schedule to the Constitution to include which of the following languages?

1. Konkani   2. Manipuri

3. Nepali   4. Maithili

Select the correct answer using the code given below:

(a) 1, 2 and 3   (b) 1, 2 and 4

(c) 1, 3 and 4   (d) 2, 3 and 4

Ans. A

Explanation

1) **The Constitution (71st Amendment) Act, 1992** added the following languages to the Eighth Schedule of the Indian Constitution: Konkani, Manipuri and Nepali

2) **Maithili was added later, along with Bodo, Dogri, and Santhali, through the 92nd Amendment Act of 2003.**

Q.3 Consider the following pairs:

Party	Its Leader
1. Bharatiya Jana Sangh	Dr. Shyama P. Mukherjee
2. Socialist Party	C. Rajagopalachari
3. Congress for Democracy	Jagjivan Ram
4. Swatantra Party	Acharya Narendra Dev

How many of the above are correctly matched?

(a) Only one   (b) Only two

(c) Only three   (d) All four

Ans. B

Pair 1 & 3 are correctly matched

Q.4 Which of the following statements are correct about the Constitution of India?

1. Powers of the Municipalities are given in Part IX A of the Constitution.

2. Emergency provisions are given in Part XVIII of the Constitution.

3. Provisions related to the amendment of the Constitution are given in Part XX of the Constitution.

Select the answer using the code given below:

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only   (d) 1, 2 and 3

Ans. D

Explanation

1) **Statement 1 is Correct:** Powers of Municipalities are given in Part IXA of the Constitution. Part IXA was added by the 74th Amendment Act of 1992.

2) **Statement 2 is correct:** Emergency provisions are indeed covered in Part XVIII of the Constitution.

3) **Statement 3 is correct:** Provisions related to the amendment of the Constitution are given in Part XX.

Q.5 Which one of the following statements is correct as per the Constitution of India?

(a) Inter-State trade and commerce is a State subject under the State List.

(b) Inter-State migration is a State subject under the State List.

(c) Inter-State quarantine is a Union subject under the Union List.

(d) Corporation tax is a State subject under the State List.

Ans. C

Explanation

• **Inter-State trade and commerce** falls under the **Union List**, giving the central government exclusive power over it.

• **Inter-State irrigation** is not specifically mentioned in any list, but it is generally considered to be a matter of **inter-state coordination** and falls under neither list exclusively.

• **Corporation tax** is a **Union subject** under the Union List.

The division of powers between the Union and State governments is outlined in the Seventh Schedule of the Indian Constitution, which contains three lists:

- **Union List:** Subjects on which the central government has exclusive powers to legislate.
- **State List:** Subjects on which state governments have exclusive powers to legislate.
- **Concurrent List:** Subjects on which both the central and state governments can legislate.

Q.6 Under which of the following articles of the Constitution of India, has the supreme court of India placed the right to Privacy?

(a) Article 15   (b) Article 16
(c) Article 19   (d) Article 21

Ans. D

Q.7 What are the duties of the Chief of Defence Staff (CDS) as Head of the Department of Military Affairs?

1. Permanent Chairman of Chiefs of Staff Committee
2. Exercise military command over the three Service Chiefs
3. Principal Military Advisor to Defence Minister on all tri-service matters

Select the correct answer using the code given below:

(a) 1, 2 and 3   (b) 1 and 2 only
(c) 2 and 3 only   (d) 1 and 3 only

Ans. D

Explanation

1) As the Permanent Chairman of the Chiefs of Staff Committee **(Option 1)**
2) The task of Chief of Defence Staff is to better standardize weapons procurement procedures and combine operations of the Army, Air Force and Navy (implying being a Principal Military Advisor)
3) There is no mention of exercising military command over the three Service Chiefs **(Option 2 is incorrect)**

Q.8 Operations undertaken by the army towards upliftment of the local population in remote areas to include addressing of their basic needs is called:

(a) Operation Sankalp   (b) Operation Maitri
(c) Operation Sadbhavana   (d) Operation Madad

Ans. C

Explanation

1) **Operation Sadbhavana** is a long-term initiative by the Indian Army focused on the socio-economic development of people residing in remote and border areas, especially in Jammu and Kashmir and the Northeast. The operation aims to address basic needs, improve infrastructure, and provide educational and healthcare facilities.
2) **Operation Sankalp**: An Indian Navy operation focused on maritime security in the Persian Gulf.

3) **Operation Maitri:** An Indian Army operation focused on providing humanitarian assistance and disaster relief to Nepal after the 2015 earthquake. **Operation Madad**: An Indian Navy operation focused on providing humanitarian assistance and disaster relief during floods in Kerala and other regions.

Q.9 The longest border between any two countries in the world is between:

(a) Canada and the United States of America
(b) Chile and Argentina
(c) China and India
(d) Kazakhstan and Russian Federation

Ans. A

Q.10 Which of the following statements about the Ethics Committee in the Lok Sabha are correct?

1. Initially it was an ad-hoc Committee.
2. Only a Member of the Lok Sabha can make a complaint relating to unethical conduct of a member of the Lok Sabha.
3. This Committee cannot take up any matter which is sub-judice.

Select the answer using the code given below:

(a) 1 and 2 only   (b) 2 and 3 only
(c) 1 and 3 only   (d) 1, 2 and 3

Ans. C

Explanation

1) Initially it was an ad-hoc Committee**. This is correct.** The Ethics Committee in the Lok Sabha was initially formed as an ad-hoc committee and later became a permanent standing committee.
2) Only a Member of the Lok Sabha can make a complaint relating to unethical conduct of a member of the Lok Sabha. **This is incorrect.** Any person can make a complaint relating to the unethical conduct of a member of the Lok Sabha.

This Committee cannot take up any matter which is sub-judice. **This is correct.** The Ethics Committee cannot deal with any matter that is currently under judicial consideration (sub-judice).

Q.11 Who was the Provisional President of the Constituent Assembly before Dr. Rajendra Prasad took over?

(a) C. Rajagopalachari   (b) Dr. B.R. Ambedkar
(c) T.T. Krishnamachari   (d) Dr. Sachchidananda Sinha

Ans. D

Q.12 With reference to the Government of India Act, 1935, consider the following statements:

1. It provided for the establishment of an All-India Federation based on the union of the British Indian Provinces and Princely States.

2. Defence and Foreign Affairs were kept under the control of the federal legislature.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. A

Explanation

1) **Statement 1 is correct.** The Government of India Act, 1935 proposed the establishment of an All-India Federation, which would comprise both the British Indian provinces and the Princely States. However, this federation never came into being due to opposition from the princely states.

2) **Statement 2 is incorrect.** The Act kept subjects like Defence and Foreign Affairs under the direct control of the Governor-General, who was appointed by the British Crown. These subjects were not under the purview of the federal legislature.

Q.13 Which one of the following is a work attributed to playwright Bhasa?

(a) Kavyalankara   (b) Natyashastra

(c) Madhyama-vyayoga (d) Mahabhashya

Ans. C

Explanation

- **Madhyama-vyayoga** is one of the thirteen plays attributed to Bhasa, a renowned Sanskrit playwright.

The other options are **incorrect:**

- **Kavyalankara** is a work on Sanskrit poetics by Bhamaha.
- **Natyashastra** is a treatise on performing arts attributed to Bharata Muni.
- **Mahabhashya** is a commentary on Pāṇini's Ashtadhyayi written by Patanjali.

Q.14 Sanghabhuti, an Indian Buddhist monk, who travelled to China at the end of the fourth century AD, was the author of a commentary on:

(a) Prajnaparamita Sutra   (b) Visuddhimagga

(c) Sarvastivada Vinaya   (d) Lalitavistara

Ans. C

Q.15 Consider the following properties included in the World Heritage List released by UNESCO:

1. Shantiniketan

2. Rani-ki-Vav

3. Sacred Ensembles of the Hoysalas

4. Mahabodhi Temple Complex at Bodhgaya

How many of the above properties were included in 2023?

(a) Only one   (b) Only two

(c) Only three   (d) All four

Ans. B

Explanation

1) Shantiniketan and Sacred Ensembles of the Hoysalas were both added to the UNESCO World Heritage List in 2023.

2) Rani-ki-Vav and Mahabodhi Temple Complex at Bodh Gaya were inscribed on the list earlier.

Q.16 As per Article 368 of the Constitution of India, the Parliament may amend any provision of the Constitution by way of:

1. Addition   2. Variation

3. Repeal

Select the correct answer using the code given below:

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only.   (d) 1, 2 and 3

Ans. D

Q.17 Consider the following countries:

1. Italy   2. Japan

3. Nigeria   4. South Korea

5. South Africa

Which of the above countries are frequently mentioned in the media for their low birth rates, or ageing population or declining population?

(a) 1, 2 and 4   (b) 1, 3 and 5

(c) 2 and 4 only   (d) 3 and 5 only

Ans. A

Explanation

1) Japan has the world's oldest population and has been facing a declining birth rate for many years.

2) South Korea also has one of the lowest fertility rates in the world and is rapidly aging.

3) While Italy also has a low birth rate and aging population, it is not as frequently mentioned in the media as Japan and South Korea. Nigeria and South Africa, on the other hand, have relatively young populations and high birth rates.

Q.18 Which of the following statements are correct in respect of a Money Bill in the Parliament?

1. Article 109 mentions special procedure in respect of Money Bills.

2. A Money Bill shall not be introduced in the Council of States.

3. The Rajya Sabha can either approve the Bill or suggest changes but cannot reject it.

4. Amendments to a Money Bill suggested by the Rajya Sabha have to be accepted by the Lok Sabha.

Select the answer using the code given below:

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1, 2 and 3   (d) 1, 3 and 4

Ans. C

Explanation

1) **Statement 1 is Correct. Article 109, of the Indian Constitution outlines the special procedure in respect of money bill.**

2) **Statement 2 is correct. Article 109(1) states a Money Bill shall not be introduced in the Council of States.** [A Money Bill can only be introduced in the Lok Sabha (House of the People) and not in the Rajya Sabha (Council of States)].

3) **Statement 3 is correct.** The Rajya Sabha can only recommend amendments to a Money Bill within 14 days. The Lok Sabha may choose to accept or reject these recommendations.

4) **Statement 4 is incorrect.** The Lok Sabha is not obligated to accept any amendments suggested by the Rajya Sabha to a Money Bill.

Q.19 Which of the following is/are correctly matched in terms of equivalent rank in the three services of Indian Defence forces?

	Army	Airforce	Navy
1.	Brigadier	Air Commodore	Commander
2.	Major General	Air Vice Marshal	Vice Admiral
3.	Major	Squadron Leader	Lieutenant Commander
4.	Lieutenant Colonel	Group Captain	Captain

Select the correct answer using the code given below:

(a) 1 and 4   (b) 1 and 3

(c) 2, 3 and 4   (d) 3 only

Ans. D

Q.20 The North Eastern Council (NEC) was established by the North Eastern Council Act, 1971. Subsequent to the amendment of NEC Act in 2002, the Council comprises which of the following members?

1. Governor of the Constituent State

2. Chief Minister of the Constituent State

3. Three Members to be nominated by the President of India

4. The Home Minister of India

Select the correct answer using the code given below:

(a) 1, 2 and 3 only   (b) 1,3 and 4 only

(c) 2 and 4 only   (d) 1, 2, 3 and 4

Ans. A

Explanation

1) **The North Eastern Council (NEC), after the 2002 amendment, comprises:**

2) Governors of the Constituent States: The eight states in the North Eastern Region are Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura.

3) Chief Ministers of the Constituent States: The Chief Ministers of the above eight states.

4) Three Members Nominated by the President of India: These are additional members nominated by the President.

5) **The Home Minister of India** is the ex-officio Chairman of the NEC, **but not a constituent member** as per the Act. The Minister of Development of North Eastern Region (DoNER) is the ex-officio Vice-Chairman.

Q.21 Consider the following statements regarding 'Nari Shakti Vandan Adhiniyam':

1. Provisions will come into effect from the 18th Lok Sabha.

2. This will be in force for 15 years after becoming an Act.

3. There are provisions for the reservation of seats for Scheduled Castes Women within the quota reserved for the Scheduled Castes.

Which of the statements given above are correct?

(a) 1, 2 and 3   (b) 1 and 2 only

(c) 2 and 3 only   (d) 1 and 3 only

Ans. C

Explanation

1) **Statement 1 is incorrect:** The provisions of the Nari Shakti Vandan Adhiniyam (Women's Reservation Bill) will come into effect after the delimitation exercise, which is expected to happen after the 2026 census. Therefore, it's unlikely to be implemented before the 19th Lok Sabha.

2) **Statement 2 is correct:** The Act will be in force for 15 years after it is enacted and implemented.

3) **Statement 3 is correct:** The Act has provisions for reserving seats for Scheduled Caste women within the quota reserved for Scheduled Castes in both the Lok Sabha and State Assemblies.

Q.22 Which of the following statements about Exercise Mitra Shakti-2023' are correct?

1. This was a joint military exercise between India and Bangladesh.

2. It commenced in Aundh (Pune).

3. Joint response during counter-terrorism operations was a goal of this operation.

4. Indian Air Force was a part of this exercise.

Select the answer using the code given below:

(a) 1, 2 and 3   (b) 1, 2 and 4

(c) 1, 3 and 4   (d) 2, 3 and 4

Ans. D

Explanation

1) **Statement 1: Incorrect**. Exercise Mitra Shakti-2023 was a joint military exercise between India and Sri Lanka, not Bangladesh.

2) **Statement 2: Correct.** The exercise commenced in Aundh (Pune), India.

3) **Statement 3: Correct.** One of the goals of this exercise was to practice joint responses during counter-terrorism operations.

4) **Statement 4: Correct**. Both the Indian Air Force and the Sri Lankan Air Force participated in the exercise.

Q.23 A Writ of Prohibition is an order issued by the Supreme Court or High Courts to:

(a) a government officer prohibiting him from taking a particular action.

(b) the Parliament/Legislative Assembly to pass a law on Prohibition. -

(c) the lower court prohibiting continuation of proceedings in a case.

(d) the Government prohibiting it from following an unconstitutional policy.

Ans. C

Explanation

1) **Writ of Prohibition:** This writ is a legal instrument issued by a higher court (Supreme Court or High Court) to a lower court or tribunal to prevent it from exceeding its jurisdiction or acting beyond its legal authority in a particular case.

2) **Purpose:** The writ ensures that judicial and quasi-judicial bodies act within their legal boundaries. It's a way to maintain the hierarchy of the court system and prevent unlawful exercise of power.

3) **Option [A] a government officer prohibiting him from taking a particular action:** While writs can be issued against government officials, this would usually be a writ of mandamus (to compel action) or certiorari (to quash a decision).

4) **Option [B] the Parliament/Legislative Assembly to pass a law on Prohibition:** Writs cannot be issued to legislative bodies. These bodies have the power to make laws within their constitutional mandate.

5) **Option [D] the Government prohibiting it from following an unconstitutional policy:** While writs can challenge government actions, this would likely be a writ

of quo warranto (to question the legality of an action) or habeas corpus (to secure the release of a person unlawfully detained).

Q.24 Consider the following statements:

1. It is the Governor of the State who recognizes and declares any community of that State as a Scheduled Tribe.

2. A community declared as a Scheduled Tribe in a State need not be so in another State.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. B

Explanation

1) **Statement 1 is incorrect:** The President of India, in consultation with the Governor of the State, has the power to declare a community as a Scheduled Tribe (ST) under Article 342 of the Indian Constitution.

2) **Statement 2 is correct:** A community declared as a Scheduled Tribe in one state may not be recognized as such in another state. The list of Scheduled Tribes can vary from state to state, depending on the specific communities residing in that region.

Q.25 With reference to Union Budget, consider the following statements:

1. The Union Finance Minister on behalf of the Prime Minister lays the Annual Financial Statement before both the Houses of Parliament.

2. At the Union level, no demand for a grant can be made except on the recommendation of the President of India.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2.   (d) Neither 1 nor 2

Ans. B

Q.26 Who of the following is the author of the books "The India Way" and "Why Bharat Matters"?

(a) Bhupender Yadav   (b) Nalin Mehta

(c) Shashi Tharoor   (d) Subrahmanyam Jaishankar

Ans. D

Q.27 Consider the following pairs:

Country	Reason for being in the news
1. Argentina	Worst economic crisis
2. Sudan	War between the country's regular army and paramilitary forces
3. Turkey	Rescinded its membership of NATO

How many of the pairs given above are correctly matched?

(a) Only one pair   (b) Only two pairs

(c) All three pairs   (d) None of the pairs

Ans. B (Pair 1 & 2 are correctly matched)

Q.28 Consider the following statements:

Statement-I: Sumed pipeline is a strategic route for Persian Gulf oil and natural gas shipments to Europe.

Statement-II: Sumed pipeline connects the Red Sea with the Mediterranean Sea.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. A

Explanation

1) **Statement-I**: The SUMED (Suez-Mediterranean) pipeline is a crucial alternative route for transporting oil from the Persian Gulf to Europe. It bypasses the Suez Canal, providing a strategic advantage.

2) **Statement-II:** The SUMED pipeline is located in Egypt and physically connects the Red Sea (where tankers arrive from the Persian Gulf) to the Mediterranean Sea (from where oil is shipped to Europe).

3) **Statement-II** directly explains why the SUMED pipeline is strategic (Statement-I): its location allows it to provide an alternative and efficient route for transporting oil between the two regions.

Q.29 Consider the following statements:

1. The Red Sea receives very little precipitation in any form.

2. No water enters the Red Sea from rivers.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only.

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. C

Explanation

1) **Statement 1**: The Red Sea is located in an arid region and receives very little rainfall.

2) **Statement 2:** The Red Sea is not fed by any rivers. Its water comes from the Gulf of Aden.

Q.30 According to the Environmental Protection Agency (EPA), which one of the following is the largest source of sulphur dioxide emissions?

(a) Locomotives using fossil fuels

(b) Ships using fossil fuels

(c) Extraction of metals from ores

(d) Power plants using fossil fuels

Ans. D

Explanation

1) The EPA states that the largest sources of sulfur dioxide (SO2) emissions come from the burning of fossil fuels, primarily in power plants.

2) While the other options listed can contribute to SO2 emissions, they are not as significant as power plants.

Q.31 Consider the following statements:

Statement-I: If the United States of America (USA) were to default on its debt, holders of US Treasury Bonds will not be able to exercise their claims to receive payment.

Statement-II: The USA Government debt is not backed by any hard assets, but only by the faith of the Government.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-I Statement-II explains

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. D

Explanation

1) **Statement I:** While a US debt default would have severe economic consequences and likely lead to legal disputes, it does not automatically mean bondholders lose their claim to payment. They would still have a legal right to be repaid, although the timing and amount of repayment could be uncertain.

2) **Statement II:** This is correct. US government debt, like most sovereign debt, is not backed by physical assets like gold. Its value is derived from the trust and confidence in the US government's ability to repay its obligations. This trust is based on the government's taxing power and the overall strength of the US economy.

In summary:

While the US government has never defaulted on its debt, such an event would have significant ramifications. However, bondholders would not automatically lose their right to payment. US government debt is backed by the full faith and credit of the US government, not by physical assets.

Q.32 Consider the following statements:

Statement-I: Syndicated lending spreads the risk of borrower default across multiple lenders.

Statement-II: The syndicated loan can be a fixed amount/lump sum of funds, but cannot be a credit line.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. C

Explanation

1) **Statement I:** Syndicated lending involves multiple lenders sharing the financing for a single borrower. This indeed spreads the risk of borrower default as no single lender is responsible for the entire loan amount.

2) **Statement II:** Syndicated loans can take various forms, including fixed amounts, revolving credit lines (where the borrower can draw and repay funds up to a limit), and term loAns. Therefore, the statement that a syndicated loan cannot be a credit line is incorrect.

Q.33 Consider the following statements in respect of the digital rupee:

1. It is a sovereign currency issued by the Reserve Bank of India (RBI) in alignment with its monetary policy.

2. It appears as a liability on the RBI's balance sheet.

3. It is insured against inflation by its very design.

4. It is freely convertible against commercial bank money and cash.

Which of the statements given above are correct?

(a) 1 and 2 only   (b) 1 and 3 only

(c) 2 and 4 only   (d) 1, 2 and 4

Ans. D

Explanation

1) **Statement 1: Correct.** The digital rupee (e₹) is indeed a digital version of India's national currency, issued directly by the RBI. It functions within the framework of the RBI's monetary policy objectives.

2) **Statement 2: Correct.** Like physical currency, the e₹ is a liability on the RBI's balance sheet, representing a claim that the holder has against the central bank.

3) **Statement 3: Incorrect.** The digital rupee is not inherently insured against inflation. Its value, like that of physical currency, can be eroded by inflation.

4) **Statement 4: Correct.** It is freely convertible against commercial bank money and cash.

Q.34 With reference to ancient India, Gautama Buddha was generally known by which of the following epithets?

1. Nayaputta   2. Shakyamuni   3. Tathagata

Select the correct answer using the code given below:

(a) 1 only   (b) 2 and 3 only.

(c) 1, 2 and 3   (d) None of the above are epithets of Gautama Buddha

Ans. B

Explanation

1) **Shakyamuni:** This epithet means "Sage of the Shakyas". The Shakyas were the clan Gautama Buddha was born into.

2) **Tathagata:** This is a Pali word often translated as "Thus-gone" or "One who has thus come". It is a term Buddha frequently used to refer to himself.

3) **Nayaputta is not an** epithet of Gautama Buddha. It is a term used in Jainism to refer to Mahavira, the last Tirthankara.

Q.35 Consider the following information:

Archaeological Site	State	Description
1. Chandraketugarh	Odisha	Trading Port town
2. Inamgaon	Maharashtra	Chalcolithic site
3. Mangadu	Kerala	Megalithic site
4. Salihundam	Andhra Pradesh	Rock-cut cave shrines

In which of the above rows is the given information correctly matched?

(a) 1 and 2   (b) 2 and 3

(c) 3 and 4   (d) 1 and 4

Ans. B

Explanation

1) **Inamgaon (Maharashtra):** This site is indeed known for its Chalcolithic remains, featuring evidence of early farming and settlements.

2) **Mangadu (Kerala):** Megalithic sites are characterized by large stone structures and burial chambers, which are found in Mangadu.

3) **Chandraketugarh (West Bengal):** This site is located in West Bengal, not Odisha. It was an ancient trading port town.

4) **Salihundam (Andhra Pradesh):** While Andhra Pradesh does have rock-cut cave shrines, Salihundam is primarily known for its Buddhist stupa.

Q. 36 Who of the following rulers of medieval India gave permission to the Portuguese to build a fort at Bhatkal?

(a) Krishnadevaraya   (b) Narasimha Saluva

(c) Muhammad Shah III   (d) Yusuf Adil Shah

Ans. A

Q.37 With reference to revenue collection by Cornwallis, consider the following statements:

1. Under the Ryotwari Settlement of revenue collection, the peasants were exempted from revenue payment in case of bad harvests or natural calamities.

2. Under the Permanent Settlement in Bengal, if the Zamindar failed to pay his revenues to the state, on or before the fixed date, he would be removed from his Zamindari.

Which of the statements given above is/are correct?

(a) 1 only.   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. B

1) **Statement 1 is incorrect.** The Ryotwari Settlement, introduced later by Thomas Munro, did not have provisions for exempting peasants from revenue payments in case of bad harvests or natural calamities. This was a major criticism of the system, as it often led to indebtedness and hardship for peasants during difficult times.

2) **Statement 2 is correct.** The Permanent Settlement, introduced by Lord Cornwallis in 1793, established a system where Zamindars had to pay a fixed amount of revenue to the state regardless of the actual revenue collected from the peasants. If a Zamindar failed to make this payment on time, the Zamindari could be auctioned off.

Q.38 Consider the following statements:

1. There are no parables in Upanishads.

2. Upanishads were composed earlier than the Puranas.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. B

Explanation

1) **Statement 1 is incorrect:** The Upanishads do contain parables. For example, the Chandogya Upanishad includes the parable of Svetaketu and the honey to explain the nature of reality.

2) **Statement 2 is correct:** The Upanishads are considered to be older than the Puranas. The Upanishads are the philosophical core of the Vedas, while the Puranas are later texts that focus on mythology and legends.

Q.39 Consider the following statements:

1. India is a member of the International Grains Council.

2. A country needs to be a member of the International Grains Council for exporting or importing rice and wheat.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2.   (d) Neither 1 nor 2

Ans. A

Explanation

1) **Statement 1 is correct:** India is indeed a member of the International Grains Council (IGC).

2) **Statement 2 is incorrect:** Membership in the IGC is not a prerequisite for a country to export or import rice and wheat. The IGC primarily focuses on promoting cooperation and transparency in the global grains trade, not regulating it.

Q.40 Which one of the following was the latest inclusion in the Intangible Cultural Heritage List of UNESCO?

(a) Chhau dance   (b) Durga puja

(c) Garba dance   (d) Kumbh mela

Ans. C

Q.41 Consider the following statements:

Statement-I: There is instability and worsening security situation in the Sahel region.

Statement-II: There have been military takeovers/coups d'état in several countries of the Sahel region in the recent past.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-I Statement-II explains

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. A

Explanation

1) **Statement I:** The Sahel region has been facing increasing instability due to factors like poverty, climate change, and the presence of extremist groups. This has led to a deteriorating security situation.

2) **Statement II**: In recent years, there have been several military coups in Sahel countries like Mali, Burkina Faso, and Niger. These coups are often triggered by the dissatisfaction with the government's inability to address the security crisis and other challenges.

3) The military takeovers (Statement II) are a significant factor contributing to the instability and worsening security situation (Statement I) in the Sahel region.

4) **Additional information:**
   - The instability in the Sahel has regional and international consequences, contributing to the displacement of people, the rise of extremism, and challenges in governance and development.
   - The international community is concerned about the situation in the Sahel and has been working on initiatives to promote stability and security in the region.

Q.42 Consider the following statements:

Statement-I: India does not import apples from the United States of America.

Statement-II: In India, the law prohibits the import of Genetically Modified food without the approval of the competent authority. Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-I Statement-II explains

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. D

Explanation

1) **Statement-I is incorrect:** India does import apples from the United States. There was a period where a retaliatory tariff impacted imports, but this has been lifted, and imports have resumed.

2) **Statement-II is correct: In India, the Food Safety and Standards Act, 2006, prohibits import, manufacture, use or sale of GM food without FSSAI's approval.**

Q.43 With reference to the Speaker of the Lok Sabha, consider the following statements:

While any resolution for the removal of the Speaker of the Lok Sabha is under consideration

1. He/She shall not preside.
2. He/She shall not have the right to speak.
3. He/She shall not be entitled to vote on the resolution in the first instance.

Which of the statements given above is/are correct?

(a) 1 only   (b) 1 and 2 only
(c) 2 and 3 only   (d) 1, 2 and 3

Ans. A

Q.44 With reference to the Indian Parliament, consider the following statements:

1. A bill pending in the Lok Sabha lapses on its dissolution.

2. A bill passed by the Lok Sabha and pending in the Rajya Sabha lapses on the dissolution of the Lok Sabha.

3. A bill in regard to which the President of India notified his/her intention to summon the Houses to a joint sitting lapses on the dissolution of the Lok Sabha.

Which of the statements given above is/are correct?

(a) 1 only   (b) 1 and 2
(c) 2 and 3   (d) 3 only

Ans. B

Explanation

1) **Statement 1**: A bill pending in the Lok Sabha lapses on its dissolution. This is correct. When the Lok Sabha (the lower house of the Indian Parliament) is dissolved, any bill that is still under consideration in the Lok Sabha automatically lapses. It would need to be reintroduced in the new Lok Sabha.

2) **Statement 2:** A bill passed by the Lok Sabha and pending in the Rajya Sabha lapses on the dissolution of the Lok Sabha. This is also correct. Even if a bill has been passed by the Lok Sabha, it must also be passed by the Rajya Sabha (the upper house) to become law. If the Lok Sabha is dissolved before the Rajya Sabha passes the bill, the bill lapses.

3) **Statement 3:** A bill in regard to which the President of India notified his/her intention to summon the Houses to a joint sitting lapse on the dissolution of the Lok Sabha. This is incorrect. If the President has notified an intention to summon a joint sitting of both houses to resolve a deadlock on a bill, that bill does not lapse even if the Lok Sabha is dissolved. The joint sitting can proceed with the new Lok Sabha once it is formed.

Q.45 With reference to the Parliament of India, consider the following statements:

1. Prorogation of a House by the President of India does not require the advice of
the Council of Ministers.

2. Prorogation of a House is generally done after the House is adjourned sine die but there is no bar to the President of India prorogating the House which is in session.

3. Dissolution of the Lok Sabha is done by the President of India who, save in exceptional circumstances, does so on the advice of the Council of Ministers.

Which of the statements given above is/are correct?

(a) 1 only   (b) 1 and 2

(c) 2 and 3   (d) 3 only

Ans. C

Explanation

1) **Statement 1: Incorrect** - The President of India acts on the advice of the Council of Ministers for all executive decisions, including the prorogation of the Houses of Parliament.

2) **Statement 2: Correct** - Prorogation usually happens after the House is adjourned sine die (indefinitely), but the President does have the power to prorogue a House while it is still in session.

3) **Statement 3: Correct** - The President dissolves the Lok Sabha, generally on the advice of the Council of Ministers. However, in exceptional circumstances, the President may exercise discretionary powers.

Q.46 Consider the following statements:

Statement-I: The European Parliament approved The Net-Zero Industry Act recently.

Statement-II: The European Union intends to achieve carbon neutrality by 2040 and therefore aims to develop all of its own clean technology by that time.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-I Statement-II explains

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. C

Explanation

1) **Statement-I:** The European Parliament did recently approve the Net-Zero Industry Act as part of the Green Deal Industrial Plan.

2) This act aims to boost the manufacturing of clean technologies within the EU.

3) **Statement-II:** While the EU aims for climate neutrality by 2050 (not 2040), the Net-Zero Industry Act focuses on increasing the manufacturing capacity of clean technologies within the EU, not solely developing all of its own technology. The act aims to enhance competitiveness and resilience in the production of these technologies.

Q.47 Consider the following statements:

Statement-I: Recently, Venezuela has achieved a rapid recovery from its economic crisis and succeeded in preventing its people from fleeing/emigrating to other countries.

Statement-II: Venezuela has the world's largest oil reserves.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. D

Explanation

Statement-I is incorrect, but Statement-II is correct.

1) **Statement I:** While Venezuela's economy has shown some signs of recovery in recent years (primarily due to increased oil production and eased sanctions), it has not achieved a rapid recovery from its economic crisis. The country still faces significant challenges, including hyperinflation, shortages of basic goods, and widespread poverty. This has led to continued emigration of Venezuelans to other countries.

2) **Statement II:** This statement is correct. Venezuela does indeed have the world's largest proven oil reserves.

Q.48 With reference to the Digital India Land Records Modernisation Programme, consider the following statements:

1. To implement the scheme, the Central Government provides 100% funding.

2. Under the Scheme, Cadastral Maps are digitised.

3. An initiative has been undertaken to transliterate the Records of Rights from local language to any of the languages recognized by the Constitution of India.

Which of the statements given above are correct?

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only   d) 1, 2 and 3

Ans. D

Q.49 With reference to the 'Pradhan Mantri Surakshit Matritva Abhiyan', consider the following statements:

1. This scheme guarantees a minimum package of antenatal care services to women in their second and third trimesters of pregnancy and six months post-delivery health care service in any government health facility.

2. Under this scheme, private sector health care providers of certain specialities can volunteer to provide services at nearby government health facilities.

Which of the statements given above is/are correct?

(a) 1 only.

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans. B

Explanation

1) **Statement 1 is incorrect:** The **Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)** focuses on providing assured, comprehensive, and quality antenatal care to pregnant women on the 9th of every month. It does not include post-delivery health care services.

2) **Statement 2 is correct:** The scheme encourages private sector health care providers, including specialists like gynecologists, radiologists, and physicians, to volunteer their services at government health facilities to enhance the quality of care provided under PMSMA.

Q.50 With reference to the Pradhan Mantri Shram Yogi Maan-Dhan (PM-SYM) Yojana, consider the following statements:

1. The entry age group for enrolment in the scheme is 21 to 40 years.

2. Age specific contribution shall be made by the beneficiary.

3. Each subscriber under the scheme shall receive a minimum pension of ₹ 3,000 per month after attaining the age of 60 years.

4. Family pension is applicable to the spouse and unmarried daughters.

Which of the statements given above is/are correct?

(a) 1, 3 and 4

(b) 2 and 3 only

(c) 2 only

(d) 1, 2 and 4

Ans. B

Explanation

1) **Statement 1: Incorrect.** The entry age for the PM-SYM scheme is 18 to 40 years.

2) **Statement 2: Correct.** The contribution amount varies depending on the age of enrollment.

3) **Statement 3: Correct.** The scheme guarantees a minimum pension of ₹3,000 per month upon reaching the age of 60.

4) **Statement 4: Incorrect.** Family pension is applicable only to the spouse of the beneficiary.

About PM-SYM:

Pradhan Mantri Shram Yogi Maan-dhan (PM-SYM) is a pension scheme for unorganized workers in India. It aims to provide social security and old-age protection to workers in the unorganized sector.

Q.51 Consider the following statements:

Statement-I: The atmosphere is heated more by incoming solar radiation than by terrestrial radiation.

Statement-II: Carbon dioxide and other greenhouse gases in the atmosphere are good absorbers of long wave radiation.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. D

Explanation

1) **Statement-I:** The atmosphere is primarily heated by terrestrial radiation (long-wave radiation emitted from the Earth's surface after it absorbs solar radiation). Solar radiation (short-wave radiation) does heat the Earth's surface, but the atmosphere is largely transparent to it.

2) **Statement-II:** This statement is correct. Greenhouse gases like carbon dioxide are effective at absorbing and re-emitting long-wave (infrared) radiation, which contributes to the greenhouse effect and keeps the Earth warm.

Q.52 Consider the following statements:

Statement-I: Thickness of the troposphere at the equator is much greater as compared to poles.

Statement-II: At the equator, heat is transported to great heights by strong convectional currents.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. A

Explanation

1) **Statement I:** The troposphere is indeed thicker at the equator than at the poles. This is due to a few factors:

- **Thermal expansion:** The equator receives more direct sunlight, leading to warmer temperatures. Warmer air expands, increasing the height of the troposphere.

- **Stronger convection:** Intense solar heating at the equator drives powerful convective currents, which carry heat upwards and further expand the troposphere.

2) Statement II: This statement accurately explains the mechanism behind the increased thickness of the troposphere at the equator. Strong convection currents transport heat to greater heights, causing the air to expand and the troposphere to thicken.

Q.53 Consider the following:

1. Pyroclastic debris
2. Ash and dust
3. Nitrogen compounds
4. Sulphur compounds

How many of the above are products of volcanic eruptions?

(a) Only one
(b) Only two
(c) Only three
(d) All four

Ans. D

Explanation

1) **Pyroclastic debris:** This is a general term for fragmented rock material ejected during volcanic eruptions. It includes everything from ash to large boulders.

2) **Ash and dust:** These are the finest particles of pyroclastic debris**.**

3) **Nitrogen compounds**: Volcanoes release various nitrogen compounds, including nitrogen gas and ammonia.

4) **Sulphur compounds:** Sulphur dioxide is a major volcanic gas, and eruptions also release other sulphur compounds like hydrogen sulphide.

All of these are produced in varying quantities depending on the type and intensity of the volcanic eruption.

Q.54 Which of the following is/are correct inference/ inferences from isothermal maps in the month of January?

1. The isotherms deviate to the north over the ocean and to the south over the continent.

2. The presence of cold ocean currents, Gulf Stream and North Atlantic Drift make the North Atlantic Ocean colder and the isotherms bend towards the north.

Select the answer using the code given below:

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans. A

Explanation

Isotherms and Land-Water Heating Differences: Isotherms (lines of equal temperature) tend to bend or deviate due to the differential heating of land and water.

1) Land heats up and cools down faster than water. In January (winter in the Northern Hemisphere), the land is colder than the ocean. This causes isotherms to bend towards the equator (south) over landmasses and towards the poles (north) over oceans.

2) Warm Ocean Currents: The Gulf Stream and North Atlantic Drift are warm ocean currents. They bring warmer water from the tropics towards the poles, making the North Atlantic Ocean warmer in winter. This causes isotherms to bend towards the north in this region.

3) Option 2 incorrectly states that these warm currents make the North Atlantic colder. In reality, they make it warmer, causing the northward bending of isotherms.

Q.55 Which of the following countries are well known as the two largest cocoa producers in the world?

(a) Algeria and Morocco
(b) Botswana and Namibia
(c) Côte d'Ivoire and Ghana
(d) Madagascar and Mozambique

Ans. C

Explanation

1) Côte d'Ivoire is the world's largest producer of cocoa, followed closely by Ghana. These two countries are located in West Africa and together account for a significant portion of the global cocoa supply.

Q.56 With reference to the Himalayan rivers joining the Ganga downstream of Prayagraj from West to East, which one of the following sequences is correct?

(a) Ghaghara-Gomati - Gandak - Kosi
(b) Gomati Ghaghara - Gandak - Kosi
(c) Ghaghara-Gomati Kosi- Gandak
(d) Gomati Ghaghara-Kosi- Gandak

Ans. B

Q.57 Consider the following statements:

Statement-I: Rainfall is one of the reasons for weathering of rocks.

Statement-II: Rain water contains carbon dioxide in solution.

Statement-III: Rain water contains atmospheric oxygen.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-II and Statement-III are correct and both of them explain Statement-I

(b) Both Statement-II and Statement-III are correct, but only one of them explains Statement-I

(c) Only one of the Statements II and III is correct and that explains Statement-I

(d) Neither Statement-II nor Statement-III is correct

Ans. A

Explanation

1) **Statement-I:** Rainfall does cause weathering of rocks. This is due to both physical processes (like erosion) and chemical processes (like reactions with minerals in the rock).

2) **Statement-II:** Rainwater does contain dissolved carbon dioxide (CO_2) from the atmosphere. This makes rainwater slightly acidic, which can react with certain minerals in rocks, leading to chemical weathering.

3) **Statement-III:** Rainwater also contains dissolved oxygen (O_2) from the atmosphere. This oxygen can react with minerals containing iron, causing oxidation and rusting, another form of chemical weathering.

Therefore, both the presence of carbon dioxide and oxygen in rainwater contribute to the weathering of rocks.

Q.58 Consider the following countries:

1. Finland   2. Germany

3. Norway   4. Russia

How many of the above countries have a border with the North Sea?

(a) Only one   (b) Only two

(c) Only three   (d) All four

Ans. B

Explanation

- **Germany and Norway** have coastlines on the North Sea.
- **Finland** is bordered by the Baltic Sea.
- **Russia** does not border the North Sea.

Q.59 Consider the following information:

Waterfall	Region	River
1. Dhuandhar	Malwa	Narmada
2. Hundru	Chota Nagpur	Subarnarekha
3. Gersoppa	Western Ghats	Netravati

In how many of the above rows is the given information correctly matched?

(a) Only one   (b) Only two.

(c) All three   (d) None

Ans. A

Explanation

Pair One is correctly matched

Water	Region	River
1. Dhuandhar	Malwa	Narmada
2. Hundru	Chota Nagpur	Narmada
3. Gersoppa	WesternGhats	Sharawati

Q.60 Consider the following information:

Region	Name of the mountain range	Type of mountain
1. Central Asia	Vosges	Fold mountain
2. Europe	Alps	Block mountain
3. North America	Appalachians	Fold mountain
4. South Amer	Andes	Fold mountain

In how many of the above rows is the given information correctly matched?

(a) Only one   (b) Only two

(c) Only three   (d) All four

Ans. B

Explanation:

Statement 3 and 4 Correctly matched

Region	Name of the Mountain range	Type of mountain
1. Europe	Vosges	Fold mountain
2. Europe	Alps	Fold Mountain
3. North America	Appalachians	Fold Mountain
4. South America	Andes	Fold mountain

Q.61 The organisms "Cicada, Froghopper and Pond skater" are:

(a) Birds   (b) Fish

(c) Insects   (d) Reptiles

Ans. C

Explanation

Cicadas are known for their loud songs and are classified as insects. Froghoppers (or spittlebugs) are small insects that create foamy masses for protection. Pond skaters are insects that can walk on the surface of water due to surface tension. None of these organisms are birds, fish, or reptiles.

Q.62 Consider the following statements:

Statement-I: Many chewing gums found in the market are considered pollution. a source of environmental

Statement-II: Many chewing gums contain plastic as gum base.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. A

Explanation

1) **Statement-I:** Many chewing gums are indeed considered a source of environmental pollution due to their improper disposal and the fact that their gum base is often made from non-biodegradable materials.

2) **Statement-II**: The gum base in many chewing gums is derived from synthetic polymers, which are essentially types of plastic. These plastics do not readily break down in the environment, leading to pollution.

Therefore, Statement-II directly explains why Statement-I is true. The presence of plastic in many chewing gums is a major reason why they contribute to environmental pollution.

Q.63 Consider the following pairs:

Country	Animal found in its natural habitat
1. Brazil	Indri
2. Indonesia	Elk
3. Madagascar	Bonobo

How many of the pairs given above are correctly matched?

(a) Only one   (b) Only two.

(c) All three   (d) None

Ans. D (None)

Explanation:-

Country	Animal Found in its natural habitat
1. Madagascar	Indri
2. North America and in high mountains of central asia	Elk
3. Democratic Republic of Congo	Bonobo

Q.64 Consider the following statements regarding World Toilet Organization:

1. It is one of the agencies of the United Nations.

2. World Toilet Summit, World Toilet Day and World Toilet College are the initiatives of this organization, to inspire action to tackle the global sanitation crisis.

3. The main focus of its function is to grant funds to the least developed countries and developing countries to achieve the end of open defecation.

Which of the statements given above is/are correct?

(a) 2 only   (b) 3 only

(c) 1 and 2   (d) 2 and 3

Ans. A

Explanation

1) **Statement 1 is incorrect.** The World Toilet Organization (WTO) is an independent global non-profit organization, not a UN agency. However, it initiated the UN World Toilet Day, which is observed on November 19th.

2) **Statement 2 is correct**. The WTO has indeed initiated the World Toilet Summit, World Toilet Day, and the World Toilet College. These initiatives aim to raise awareness, drive action, and provide education and training to address the global sanitation crisis.

3) **Statement 3 is incorrect**. The WTO's primary focus is not on directly granting funds. Instead, it focuses on advocacy, education, and building local marketplace opportunities to drive demand for sanitation solutions and achieve sustainable sanitation for all.

Q.65 Consider the following statements:

1. Lions do not have a particular breeding season.

2. Unlike most other big cats, cheetahs do not roar.

3. Unlike male lions, male leopards do not proclaim their territory by scent marking.

Which of the statements given above are correct?

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only   (d) 1, 2 and 3

Ans. A

Explanation

1) **Statement 1:** Lions do not have a particular breeding season.

   This is correct. Lions can breed throughout the year, although there may be peaks in certain seasons depending on the region.

2) **Statement 2:** Unlike most other big cats, cheetahs do not roar. This is correct. Cheetahs have a different vocalization pattern that includes purring, chirping, and other sounds, but not a full roar.

3) **Statement 3:** Unlike male lions, male leopards do not proclaim their territory by scent marking. This is incorrect. Both male lions and male leopards use scent marking (urine, feces, and glandular secretions) to mark their territory and communicate with other individuals.

Q.66 Which one of the following is the correct description of "100 Million Farmers"?

(a) It is a platform for accelerating the transition towards food and water systems that are net-zero (carbon), nature-positive and that aims to increase farmer resilience.

(b) It is an international alliance and a network of individuals and farming organisations interested in supporting and strengthening the development of the organic animal husbandry.

(c) It is a digital platform fully integrated with service providers and built on blockchain that lets buyers, sellers and third parties trade fertilizers quickly and securely.

(d) It is a platform with the mission of encouraging the farmers to form Farmer Product Organisations or Agribusiness Consortiums, thus facilitating the access to global open markets to sell their products.

Ans. A

Explanation

It is a platform for accelerating the transition towards food and water systems that are net-zero (carbon), nature-positive and that aims to increase farmer resilience.

This initiative, led by the World Economic Forum, aims to reach one-fifth of the world's farmer population to drive transformative change in agriculture. It focuses on:

- **Sustainability:** Promoting climate-smart and environmentally friendly farming practices.
- **Resilience:** Enhancing farmers' ability to adapt to climate change and other challenges.
- **Collaboration:** Bringing together public and private stakeholders to support farmers in the transition.

Q.67 Consider the following:

1. Battery storage
2. Biomass generators
3. Fuel cells
4. Rooftop solar photovoltaic units

How many of the above are considered "Distributed Energy Resources"?

(a) Only one　　　　　　　　(b) Only two

(c) Only three　　　　　　　(d) All four

Ans. D

Explanation

All of the listed items are considered Distributed Energy Resources (DERs).

1. **Battery storage:** Stores energy generated from other sources (like solar) and releases it when needed, often at the local level.
2. **Biomass generators**: Generate electricity from organic matter, typically located near the source of biomass.
3. **Fuel cells**: Convert fuel (like hydrogen) into electricity, often used for smaller-scale applications.
4. **Rooftop solar photovoltaic units**: Generate electricity from sunlight and are located at the point of consumption.

DERs are characterized by their smaller scale, location closer to the point of use, and ability to operate independently or in conjunction with the larger electrical grid.

Q.68 Which one of the following shows a unique relationship with an insect that has coevolved with it and that is the only insect that can pollinate this tree?

(a) Fig　　　　　　　　　　　(b) Mahua

(c) Sandalwood　　　　　　　(d) Silk cotton

Ans. A

Explanation

Figs and fig wasps have a unique, obligate mutualism. The fig wasp is the only insect that can pollinate the fig, and the fig provides the only suitable breeding ground for the wasp. This relationship is an example of coevolution, where two species have evolved together in a way that benefits both.

1) **Mahua:** Mahua trees are pollinated by various insects, including bees, butterflies, and moths.
2) **Sandalwood:** Sandalwood trees are primarily pollinated by wind, but insects like bees can also play a role.
3) **Silk cotton:** Silk cotton trees are pollinated by a variety of insects, including bees, wasps, and butterflies.

Q.69 Consider the following:

1. Butterflies　　2. Fish　　　3. Frogs

How many of the above have poisonous species among them?

(a) Only one　　　　　　　　(b) Only two

(c) All three　　　　　　　　(d) None

Ans. C

Explanation

1) **Butterflies**: Some species, like the Monarch butterfly, are poisonous due to the toxins they ingest from milkweed plants as caterpillars.
2) **Fish:** There are numerous poisonous fish species, such as pufferfish and lionfish.
3) **Frogs:** Many frog species secrete toxins through their skin as a defense mechanism.

Q.70 Consider the following:

1. Cashew　　2. Papaya　　3. Red sanders

How many of the above trees are actually native to India?

(a) Only one　　　　　　　　(b) Only two

(c) All three　　　　　　　　(d) None

Ans. A

Explanation

1) **Out of the three options, only red sanders is native to India.**
2) **Cashew:** Originally native to South America, specifically Brazil. It was introduced to India by Portuguese traders in the 16th century.

3) Papaya: Believed to have originated in Central America and southern Mexico. It was also brought to India by traders.

4) Red Sanders (Red Sandalwood): A valuable tree species found in the Eastern Ghats of India. It is endemic to this region, meaning it is naturally found nowhere else.

Q.71 Consider the following airports:

1. Donyi Polo Airport

2. Kushinagar International Airport

3. Vijayawada International Airport

In the recent past, which of the above have been constructed as Greenfield projects?

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only   (d) 1, 2 and 3

Ans. A

Explanation

1) Donyi Polo Airport in Itanagar and Kushinagar International Airport in Kushinagar are both new airports constructed as greenfield projects.

2) Vijayawada International Airport was upgraded from an existing domestic airport to an international airport, and therefore, it is not considered a greenfield project.

Q.72 With reference to "water vapour", which of the following statements is/are correct?

1. It is a gas, the amount of which decreases with altitude.

2. Its percentage is maximum at the poles.

Select the answer using the code given below:

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. A

Explanation

1) Statement 1 is correct: Water vapor is the gaseous form of water. As you go higher in altitude, the air gets colder and less dense, which reduces its ability to hold water vapor. This is why the amount of water vapor decreases with increasing altitude.

2) Statement 2 is incorrect: The percentage of water vapor is generally higher in warmer regions like the tropics. This is due to increased evaporation at higher temperatures. The poles, being colder, have less evaporation and therefore a lower percentage of water vapor in the air.

Q.73 Consider the following description:

1. Annual and daily range of temperatures is low.

2. Precipitation occurs throughout the year.

3. Precipitation varies between 50 cm-250 cm.

What is this type of climate?

(a) Equatorial climate

(b) China type climate

(c) Humid subtropical climate

(d) Marine West coast climate

Ans. D

Explanation

- **Marine West Coast Climate:** This climate is characterized by mild temperatures due to the moderating influence of the ocean. Precipitation is abundant throughout the year, often brought by onshore winds. The given description aligns with these characteristics.

- **Equatorial climate:** While this climate has consistent rainfall, the temperatures are much higher and have less variation than described.

- **China type climate:** This climate has more distinct seasons with a wider temperature range.

- **Humid subtropical climate:** This climate also has a wider temperature range and often experiences a drier season.

Q.74 With reference to "Coriolis force", which of the following statements is/are correct?

1. It increases with increase in wind velocity.

2. It is maximum at the poles and is absent at the equator.

Select the answer using the code given below:

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. C

Explanation

1) Statement 1: It increases with an increase in wind velocity. This is correct. The Coriolis force is directly proportional to the speed of the object (in this case, wind) that is moving. Higher wind velocity results in a stronger Coriolis force and thus, greater deflection.

2) Statement 2: It is maximum at the poles and is absent at the equator. This is also correct. The Coriolis force arises due to Earth's rotation. It is strongest at the poles, where the Earth's surface is rotating the fastest, and gradually decreases towards the equator, where it becomes zero.

Q.75 On June 21 every year, which of the following latitude(s) experience(s) a sunlight of more than 12 hours?

1. Equator   2. Tropic of Cancer

3. Tropic of Capricorn   4. Arctic Circle

Select the correct answer using the code given below:

(a) 1 only   (b) 2 only

(c) 3 and 4   (d) 2 and 4

Ans. D

Explanation

1) **June 21st is the summer solstice in the Northern Hemisphere. This means the Earth's tilt is maximized towards the sun, resulting in the longest day of the year in the Northern Hemisphere.**

2) **Tropic of Cancer (23.5° N):** On the summer solstice, the sun is directly overhead at noon at the Tropic of Cancer. This leads to the maximum daylight hours at this latitude.

3) **Arctic Circle (66.5° N):** All latitudes north of the Arctic Circle experience 24 hours of daylight on the summer solstice. This is known as the midnight sun.

4) **Equator (0°):** The equator receives roughly 12 hours of daylight and 12 hours of darkness throughout the year.

5) **Tropic of Capricorn (23.5° S):** The Tropic of Capricorn experiences its shortest day on June 21st, as it is the winter solstice in the Southern Hemisphere**.**

Q.76 One of the following regions has the world's largest tropical peatland, which holds about three years worth of global carbon emissions from fossil fuels; and the possible destruction of which can exert detrimental effect on the global climate. Which one of the following denotes that region?

(a) Amazon Basin   (b) Congo Basin

(c) Kikori Basin   (d) Rio de la Plata Basin

Ans. B

Explanation

1) The **Congo Basin** peatlands are the largest tropical peatlands in the world, storing an estimated 26-32 billion tonnes of carbon. This is roughly equivalent to three years of global fossil fuel emissions.

2) **Amazon Basin:** While containing vast areas of rainforest, it is not home to the largest tropical peatlands.

3) **Kikori Basin:** Located in Papua New Guinea, it is known for its biodiversity, but not its peatlands.

4) **Rio de la Plata Basin:** This is a river basin in South America and does not have extensive peatlands.

Q.77 With reference to perfluoroalkyl and polyfluoroalkyl substances (PFAS) that are used in making many consumer products, consider the following statements:

1. PFAS are found to be widespread in drinking water, food and food packaging materials.

2 PFAS are not easily degraded in the environment.

3. Persistent exposure to PFAS can lead to bioaccumulation in animal bodies.

Which of the statements given above are correct?

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only.   (d) 1, 2 and 3

Ans. D

Explanation

1) **Statement 1:** PFAS are indeed found widely in drinking water, food, and food packaging materials due to their extensive use in various consumer and industrial products.

2) **Statement 2**: PFAS are known as "forever chemicals" because they do not easily break down in the environment, persisting for long periods.

3) **Statement 3:** Due to their persistence, PFAS can accumulate in animal bodies over time through a process called bioaccumulation.

Therefore, all three statements are correct.

Q.78 Consider the following:

1. Carabid beetles   2. Centipedes   3. Flies

4. Termites   5. Wasps

Parasitoid species are found in how many of the above kind of organisms?

(a) Only two   (b) Only three

(c) Only four   (d) All five

Ans. B Only three.

Explanation

1) **Flies (Diptera):** Many fly families contain parasitoid species, such as Tachinid flies, which are important parasitoids of caterpillars and other insects.

2) **Wasps (Hymenoptera):** This is the largest group of parasitoids, with many families specializing in parasitizing different hosts, including caterpillars, beetles, and aphids.

3) **Beetles (Coleoptera):** While most beetles are not parasitoids, a few families, such as Ripiphoridae, do have parasitoid members.

4) **Centipedes (Chilopoda)** and **Termites (Isoptera)** are not known to have parasitoid species within their ranks.

Q.79 Consider the following planta:

1. Groundnut   2. Horse-gram   3. Soybean

How many of the above belong to the pea family?

(a) Only one   (b) Only two

(c) All three   (d) None

Ans. C

Explanation

All three plants - groundnut, horse-gram, and soybean - belong to the Fabaceae family, also known as the legume or pea family.

Q.80 Consider the following statements:

Statement-1:

The Indian Flying Fox is placed under the "vermin" category in the Wild Life (Protection) Act, 1972.

Statement-II:

The Indian Flying Fox feeds on the blood of other animals.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. C

Explanation

Statement-I is correct, but Statement-II is incorrect.

1) **Statement-I:** The Indian Flying Fox is indeed listed as vermin under the Wildlife (Protection) Act, 1972. This classification allows for their culling under certain circumstances.

2) **Statement-II:** Indian Flying Foxes are frugivorous, meaning they primarily feed on fruits. They do not feed on the blood of other animals.

Q.81 The total fertility rate in an economy is defined as:

(a) the number of children born per 1000 people in the population in a year.

(b) the number of children born to a couple in their lifetime in a given population.

(c) the birth rate minus death rate.

(d) the average number of live births a woman would have by the end of her child-bearing age.

Ans. D

Explanation

- **[A] the number of children born per 1000 people in the population in a year:** This describes the crude birth rate.
- **[B] the number of children born to a couple in their lifetime in given population:** This is a factor in fertility rates but doesn't define it.
- **[C] the birth rate minus death rate:** This describes the rate of natural increase.

The total fertility rate is a key indicator used to understand population dynamics and project future population growth. **A total fertility rate of 2.1** is generally considered the replacement level in developed countries, meaning each generation will replace itself.

Q.82 Consider the following statements:

1. In India, Non-Banking Financial Companies can access the Liquidity Adjustment Facility window of the Reserve Bank of India.

2. In India, Foreign Institutional Investors can hold the Government Securities (G-Secs).

3. In India, Stock Exchanges can offer separate trading platforms for debts.

Which of the statements given above is/are correct?

(a) 1 and 2 only   (b) 3 only

(c) 1, 2 and 3   (d) 2 and 3 only

Ans. C or D

Q.83 In India, which of the following can trade in Corporate Bonds and Government Securities?

1. Insurance Companies

2. Pension Funds

3. Retail Investors

Select the correct answer using the code given below:

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only   (d) 1, 2 and 3

Ans. D

Explanation

In India, all of the following can trade in Corporate Bonds and Government Securities:

- **Insurance Companies:** They invest in these securities as part of their asset allocation strategy.
- **Pension Funds:** These funds invest in these securities to generate returns for future pension payouts.
- **Retail Investors:** Individual investors can also buy and sell these securities through various platforms and brokers.

This is a well-established part of the Indian financial market, allowing a wide range of participants to access and trade in these instruments.

Q.84 Consider the following:

1. Exchange-Traded Funds (ETF)

2. Motor vehicles

3. Currency swap

Which of the above is/are considered financial instruments?

(a) 1 only   (b) 2 and 3 only

(c) 1, 2 and 3   (d) 1 and 3 only

Ans. D

Explanation

- **Exchange-Traded Funds (ETFs):** These are investment funds traded on stock exchanges, representing a collection of assets like stocks, bonds, or commodities. They are a type of security and hence a financial instrument.

- **Motor vehicles:** These are physical assets used for transportation and not considered financial instruments.
- **Currency swap:** This is a derivative contract where two parties exchange principal and interest payments in different currencies. It is a financial instrument.

Therefore, only ETFs and currency swaps are considered financial instruments.

Q.85 With reference to the sectors of the Indian economy, consider the following pairs:

	Economic activity	Sector
1.	Storage of agricultural produce	Secondary
2.	Dairy farm	Primary
3.	Mineral exploration	Tertiary
4.	Weaving cloth	Secondary

How many of the pairs given above are correctly matched?

(a) Only one   (b) Only two

(c) Only three   (d) All four

Ans. B

Explanation

1. Storage of agricultural produce: Tertiary sector

2. **Dairy farm:** Primary

3. Mineral exploration: Primary - This is also correct. Mineral exploration involves extracting raw materials from the earth.

4. Weaving cloth: Secondary - This is correct. Weaving involves the transformation of raw materials (cotton, wool, etc.) into a finished product

Q.86 Consider the following materials:

1. Agricultural residues

2. Corn grain

3. Wastewater treatment sludge

4. Wood mill waste

Which of the above can be used as feedstock for producing Sustainable Aviation Fuel?

(a) 1 and 2 only   (b) 3 and 4 only

(c) 1, 2, 3 and 4   (d) 1, 3 and 4 only

Ans. C

Explanation

An estimated 1 billion dry tons of biomass can be collected sustainably each year in the United States, enough to produce 50–60 billion gallons of low-carbon biofuels. These resources include:

- Corn grain
- Oil seeds
- Algae
- Other fats, oils, and greases
- Agricultural residues
- Forestry residues
- Wood mill waste
- Municipal solid waste streams
- Wet wastes (manures, wastewater treatment sludge)
- Dedicated energy crops.

This vast resource contains enough feedstock to meet the projected fuel demand of the U.S. aviation industry, additional volumes of drop-in low carbon fuels for use in other modes of transportation, and produce high-value bioproducts and renewable chemicals.

Q.87 With reference to physical capital in Indian economy, consider the following pairs:

	Items	Category
1.	Farmer's plough	Working capital
2.	Computer	Fixed capital
3.	Yarn used by the weaver	Fixed capital
4.	Petrol	Working capital

How many of the above pairs are correctly matched?

(a) Only one   (b) Only two

(c) Only three.   (d) All four

Ans. B

Explanation

Farmer's plough: This is a tool used in the production process and is considered fixed capital.

- **Computer:** A computer is a long-lasting asset used in production and is categorized as fixed capital.

- **Yarn used by the weaver:** Yarn is a raw material that is consumed in the production process and is considered working capital.

- **Petrol:** Petrol is a fuel used in the production process and is considered working capital.

Q.88 Which one of the following words/phrases is most appropriately used to denote "an interoperable network of 3D virtual worlds that can be accessed simultaneously by millions of users, who can exert property rights over virtual items"?

(a) Big data analytics   (b) Cryptography

(c) Metaverse   (d) Virtual matrix

Ans. C

Explanation

1) **Metaverse** specifically refers to the concept of a shared, immersive digital space where users interact with each other and virtual objects, often with elements of ownership and persistent economies. This aligns perfectly with the description provided.

2) **Big data** analytics deals with the processing and analysis of large datasets, not the virtual worlds themselves.

3) **Cryptography** focuses on secure communication and data protection, which is relevant to the metaverse but not its defining feature.

4) **Virtual matrix** is a broader term that can encompass various virtual environments but doesn't necessarily imply the specific interoperable and ownership-focused nature of the metaverse.

Q.89 With reference to the rule/rules imposed by the Reserve Bank of India while treating foreign banks, consider the following statements:

1. There is no minimum capital requirement for wholly owned banking subsidiaries in India.

2. For wholly owned banking subsidiaries in India, at least 50% of the board members should be Indian nationals.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. B

Explanation

1) **Statement 1 is incorrect.** The Reserve Bank of India (RBI) mandates a minimum capital requirement for wholly owned banking subsidiaries (WOS) in India. The initial minimum paid-up voting equity capital for a WOS is ₹5 billion.

2) **Statement 2 is correct.** The RBI requires that at least 50% of the board of directors of a WOS should be Indian nationals residing in India. This is to ensure local representation and understanding of the Indian banking environment.

Q.90 With reference to Corporate Social Responsibility (CSR) rules in India, consider the following statements:

1. CSR rules specify that expenditures that benefit the company directly or its employees will not be considered as CSR activities.

2. CSR rules do not specify minimum spending on CSR activities.

Which of the statements given above is/are correct?

(a) 1 only   (b) 2 only

(c) Both 1 and 2   (d) Neither 1 nor 2

Ans. A

Explanation

1) **Statement 1: This is correct.** The Companies Act, 2013, and the CSR Rules specifically exclude activities that primarily benefit the company or its employees from being considered as CSR activities. This is to ensure that CSR initiatives genuinely benefit society at large.

2) **Statement 2: This is incorrect.** The CSR rules mandate that companies meeting specific criteria (net worth, turnover, or net profit) must spend at least 2% of their average net profits of the preceding three years on CSR activities.

Q.91 With reference to radioisotope thermoelectrie generators (RTGs), consider the following statements:

1. RTGs are miniature fission reactors.

2. RTGs are used for powering the onboard systems of spacecrafts.

3. RTGs can use Plutonium-238, which is a by-product of weapons development.

Which of the statements given above are correct?

(a) 1 and 2 only   (b) 2 and 3 only

(c) 1 and 3 only   (d) 1, 2 and 3

Ans. B

Explanation

1) **Statement 1 is incorrect:** RTGs are not fission reactors. They use the heat generated from the natural radioactive decay of isotopes (like Plutonium-238) to generate electricity.

2) **Statement 2 is correct:** RTGs are indeed used to power the onboard systems of spacecraft, especially those venturing far from the Sun where solar power isn't practical.

3) **Statement 3 is correct:** Plutonium-238, though also produced in reactors, can be a by-product of nuclear weapons production.

Q.92 Consider the following statements:

Statement-I: Giant stars live much longer than dwarf stars.

Statement-II: Compared to dwarf stars, giant stars have a greater rate of nuclear reactions.

Which one of the following is correct in respect of the above statements?

(a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I

(b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I.

(c) Statement-I is correct, but Statement-II is incorrect

(d) Statement-I is incorrect, but Statement-II is correct

Ans. D

Explanation

Statement-I is incorrect, but Statement-II is correct.

1) **Statement I (Incorrect):** Giant stars actually live shorter lives than dwarf stars. This is because they burn through their nuclear fuel much faster due to their higher temperatures and pressures.

2) **Statement II (Correct):** Giant stars do have a much higher rate of nuclear reactions compared to dwarf stars. The immense pressure and temperature in their cores drive fusion at a rapid pace.

The relationship between the statements: The higher rate of nuclear reactions in giant stars (Statement II) is the very reason why they burn through their fuel so quickly and have shorter lifespans (contradicting Statement I).

Q.93 Which one of the following is synthesised in human body that dilates blood vessels and increases blood flow?

(a) Nitric oxide   (b) Nitrous oxide

(c) Nitrogen dioxide   (d) Nitrogen pentoxide

Ans. A

Explanation

1) Nitric oxide (NO) is a naturally produced gas in the human body. It plays a crucial role as a signaling molecule, particularly in the cardiovascular system. One of its primary functions is to relax and dilate blood vessels, leading to increased blood flow and lower blood pressure.

2) Nitrous oxide (N2O) is commonly known as laughing gas and is used as an anesthetic. It doesn't have the same vasodilatory effects as nitric oxide.

3) Nitrogen dioxide (NO2) and Nitrogen pentoxide (N2O5) are pollutants and do not have a physiological role in the human body in terms of blood vessel dilate.

Q.94 Consider the following activities:

1. Identification of narcotics on passengers at airports or in aircraft

2. Monitoring of precipitation

3. Tracking the migration of animals

In how many of the above activities can the radars be used?

(a) Only one   (b) Only two

(c) All three   (d) None

Ans. B

Explanation

1) **Identification of narcotics:** While not the primary method, specialized radar systems can be used to detect anomalies in luggage or on a person's body that might indicate hidden narcotics.

2) **Monitoring of precipitation:** Weather radar is a fundamental tool for tracking the formation, movement, and intensity of precipitation.

3) **Tracking the migration of animals:** Radar technology is used to monitor the movement of large groups of animals like birds, insects, and bats during migration.

Q.95 Consider the following aircraft:

1. Rafael   2. MiG-29   3. Tejas MK-1

How many of the above are considered fifth generation fighter aircraft?

(a) Only one   (b) Only two

(c) All three   (d) None

Ans. D

Explanation

None of the aircraft listed are considered fifth-generation fighter aircraft.

1) **Rafael:** This is a series of aircraft made by Israel, including the Rafale fighter jet (often misspelled as Rafael). The Rafale is a 4.5 generation fighter.

2) **MiG-29:** This is a Russian-designed 4th generation fighter jet.

3) **Tejas MK-1:** This is a 4.5 generation fighter jet developed by India.

4) Fifth-generation fighters are characterized by advanced stealth capabilities, sensor fusion, supercruise, and high maneuverability. Some examples of fifth-generation fighters include the F-22 Raptor, F-35 Lightning II, J-20, and Su-57.

Q.96 In which of the following are hydrogels used?

1. Controlled drug delivery in patients

2. Mobile air-conditioning systems

3. Preparation of industrial lubricants

Select the correct answer using the code given below:

(a) 1 only   (b) 1 and 2 only

(c) 2 and 3 only   (d) 1, 2 and 3

Ans. D

Explanation

1) **Controlled drug delivery in patients:** This is the most common and well-known use of hydrogels, as they can be designed to release drugs at specific rates and locations within the body.

2) **Mobile air-conditioning systems:** While not as common, hydrogels can be used in air-conditioning systems as a desiccant material to absorb moisture from the air. This helps improve the efficiency and performance of the system.

3) **Preparation of industrial lubricants:** Hydrogels can be used as thickeners and stabilizers in industrial lubricants, improving their viscosity and lubrication properties.

Q.97 Which one of the following is the exhaust pipe emission from Fuel Cell Electric Vehicles, powered by hydrogen?

(a) Hydrogen peroxide　　　　(b) Hydronium

(c) Oxygen　　　　　　　　　(d) Water vapour

Ans. D

Explanation

Fuel cell electric vehicles (FCEVs) powered by hydrogen produce electricity through a chemical reaction between hydrogen and oxygen.

The only byproduct of this reaction is water (H_2O), which is emitted as water vapor.

The other options are incorrect:

- Hydrogen peroxide (H_2O_2) is a different chemical compound and not a byproduct of FCEVs.
- Hydronium (H_3O^+) is an ion formed in acidic solutions and not relevant to FCEV emissions.
- Oxygen (O_2) is one of the reactants in the fuel cell, not a product.

Q.98 Recently, the term "pumped-storage hydropower" is actually and appropriately discussed in the context of which one of the following?

(a) Irrigation of terraced crop fields

(b) Lift irrigation of cereal crops

(c) Long duration energy storage

(d) Rainwater harvesting system

Ans. C

Explanation

1) **Pumped-storage hydropower (PSH) is a technology** used to store excess energy during periods of low demand and release it during periods of high demand. This makes it an excellent solution for long-duration energy storage, especially when coupled with intermittent renewable energy sources like wind and solar.

2) **Other options:**

　(A) **Irrigation of terraced crop fields:** While PSH involves moving water, it's not directly related to irrigation methods.

　(B) **Lift irrigation of cereal crops:** Similar to A, PSH is not specifically designed for lift irrigation.

　(C) **Rainwater harvesting system**: PSH can be used to store excess energy from renewable sources, but it's not a primary component of rainwater harvesting systems.

Q.99 "Membrane Bioreactors" are often discussed in the context of:

(a) Assisted reproductive technologies

(b) Drug delivery nanotechnologies

(c) Vaccine production technologies

(d) Wastewater treatment technologies

Ans. D

Explanation

1) **Membrane Bioreactors (MBRs) are a type of wastewater treatment** technology that combines biological treatment with membrane filtration to remove pollutants.

2) This combination allows for a compact footprint and high-quality effluent, making MBRs suitable for various applications, including municipal and industrial wastewater treatment.

3) **Option: [A] Assisted reproductive technologies:** These technologies deal with procedures like in vitro fertilization (IVF), where membrane bioreactors are not used.

4) **Option: [B] Drug delivery nanotechnologies:** These technologies focus on using nanoparticles to deliver drugs to specific locations in the body, and membrane bioreactors are not directly involved in this process.

5) **Option: [C] Vaccine production technologies:** While membranes may be used in certain stages of vaccine production (e.g., purification), membrane bioreactors specifically are not a primary technology in this field.

Q.100 With reference to the Indian economy, "Collateral Borrowing and Lending Obligations" are the instruments of:

(a) Bond market　　　　　(b) Forex market

(c) Money market　　　　(d) Stock market

Ans. C

Explanation

1) **Collateralized Borrowing and Lending Obligations (CBLOs)** are short-term money market instruments used for borrowing and lending funds. They were introduced in India by the Clearing Corporation of India Ltd. (CCIL) to provide liquidity support to non-bank entities who are restricted from accessing the interbank call money market.

2) **Bond market:** Deals with long-term debt instruments (bonds) issued by governments and corporations.

3) **Forex market:** Facilitates the exchange of foreign currencies.

4) **Stock market:** Where shares of publicly listed companies are traded.