APTI PLUS
Academy for Civil Services Pvt. Ltd.
CREATING CIVIL SERVANTS FOR THE NATION

# ANSWER OF OCS (2022)
# MAINS EXAMINATION (GS - III)

# OPSC OAS MAINS
# DETAILED EXPLANATION OF GS-III OCS- 2022

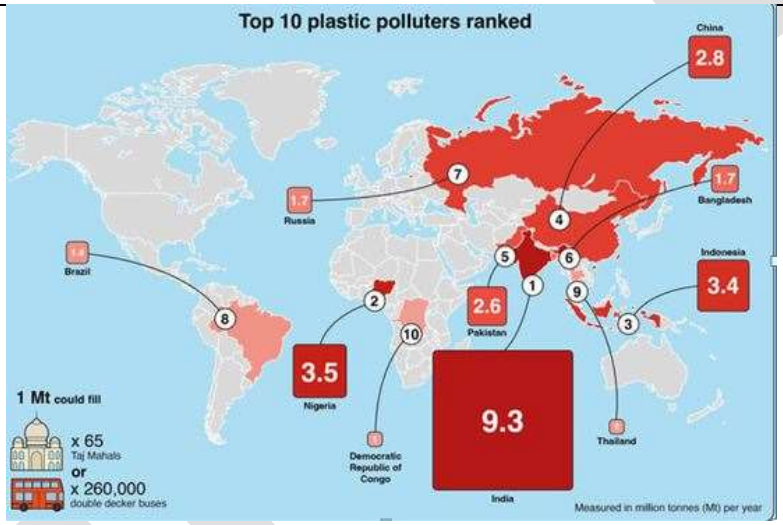
**1. Assess the environmental and human health impacts of plastic pollution. Examine the sources, distribution and persistence of plastic pollutants in terrestrial and aquatic ecosystems. Discuss potential strategies and technological innovations for mitigating plastic pollution and promoting sustainable waste management practices. 20**

**Answer:**

**Introduction**

Plastic waste is a significant global issue, causing widespread pollution and posing threats to ecosystems and human health. It is a major contributor to the triple planetary crisis, exacerbating environmental degradation, climate change, and biodiversity loss.

**Globally, roughly 69 percent of the world's plastic waste emissions come from 20 countries, of which four are low-income countries, nine are lower-middle-income countries and seven are upper-middle-income.**

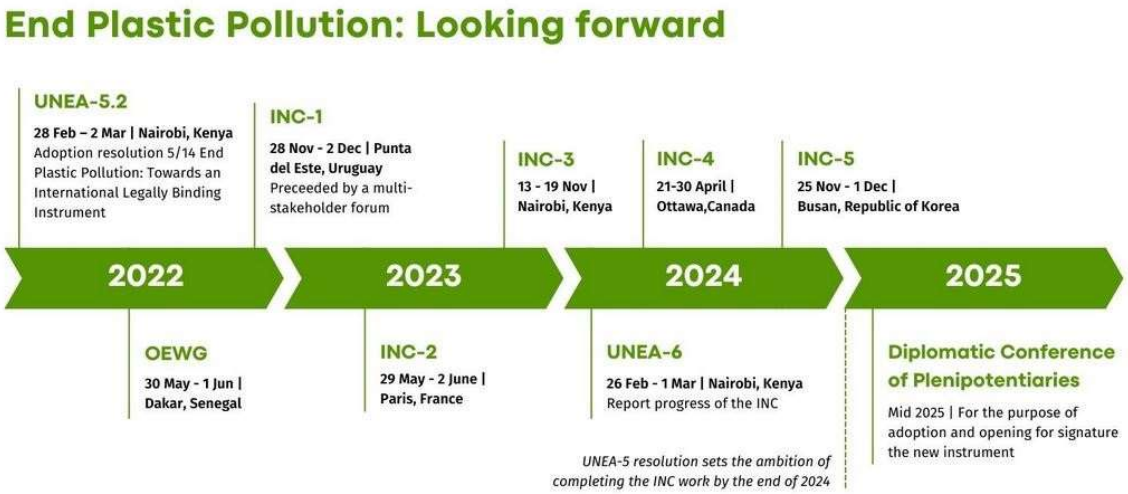



**Body**

| Terrestrial Ecosystem | Aquatic Ecosystem |
|---|---|
| **Sources** | **Sources** |
| Disposable items like bags, bottles, straws, and cutlery constitute a significant portion of plastic waste. | Fishing gear (e.g., nets, lines)<br>E.g. Discarded nets, lines, and ropes now make up about 46% of the Great Pacific Garbage Patch. |
| Tiny plastic particles, less than 5 millimeters in size, can originate from the breakdown of larger plastics or be directly added to products like cosmetics and detergents. | Industrial discharge & wastewater such as heavy metals (Cd, Ni, Pb, Hg, As, Cu, Cr), high organic matter content, synthetic dyes and chemicals, suspended particles, and infectious microorganisms. |
| Manufacturing processes can generate plastic waste, including scraps, pellets, and fibers. | Runoff can pick up and deposit harmful pollutants like trash, chemicals, and dirt/sediment into streams, lakes, and groundwater. |
| **Distribution** | **Distribution** |
| Concentrated around agricultural and urban areas | Oceans, rivers, lakes, and coastal areas |
| Dispersed through soil and water runoffs | Ocean currents spread plastics globally |

| | |
|---|---|
| Found in soil, riverbanks, and floodplains | Hotspots near industrial and urban effluents |
| **Persistence** | **Persistence** |
| Ingestion of microplastics and exposure to chemicals associated with plastic pollution can pose health risks to humans. | Plastic pollution can harm marine life, disrupt food webs, and reduce biodiversity. |
| Breakdown into microplastics over time and Decomposition hindered by soil properties. | Plastic pollution can have economic impacts, including damage to fisheries, tourism, and infrastructure. |

**Potential Strategies:**




- **The 3R's + E Strategy:**
  - **Reduce:** Cut down plastic usage through conscious consumer choices and reducing packaging.
  - **Reuse:** Repurpose plastic items wherever possible before disposal.
  - **Recycle:** Collect and process plastic waste to create new products, minimizing landfill contributions.
- **Educate:** Raise awareness and promote behavioral change regarding plastic usage and recycling.
- **Circular economy:** Develop and implement regulations to combat plastic pollution and promote a circular economy.
- **Policy Shifts:** Create incentives for businesses and consumers to adopt sustainable practices, enhance plastic design, and improve recycling processes.
- **Taxation and Incentives:** Impose taxes on single-use plastics and provide subsidies or tax breaks for alternatives.
- **Standards and Labelling:** Introduce product standards and labels to inform the public about environmental and health impacts.
- **Extended Producer Responsibility (EPR):** Mandate that manufacturers manage the lifecycle of their plastic products, from production to disposal.

**CASE STUDIES**

San Francisco, USA implemented a comprehensive Zero Waste program, which includes mandatory recycling and composting ordinances, bans on single-use plastic bags and polystyrene foam containers, and incentives for businesses to reduce waste.

Taiwan implemented a successful waste management system, including a comprehensive recycling program with source separation at households and community recycling centers. The government also introduced a waste disposal fee system, encouraging residents to reduce waste generation and increase recycling rates.

**Recommendations**


**Recycling and Upcycling**: Initiatives aimed at recycling and upcycling contribute to a shift in waste management toward resource optimization and the economy.

**Ocean Cleanup Technologies**: The application of ocean cleanup technologies shows how committed humans are to environmental stewardship, especially marine ecosystems. Drones that operate on their own and floating barriers are two examples of the unique technology used for ocean remediation.

**Conclusion**

There is no silver bullet to solving the world's plastic problem. It will require governments at both the national and sub-national levels to tackle the regulation of single-use plastic products, determining what policy approaches they want to use and what type of legislation will support their objectives.

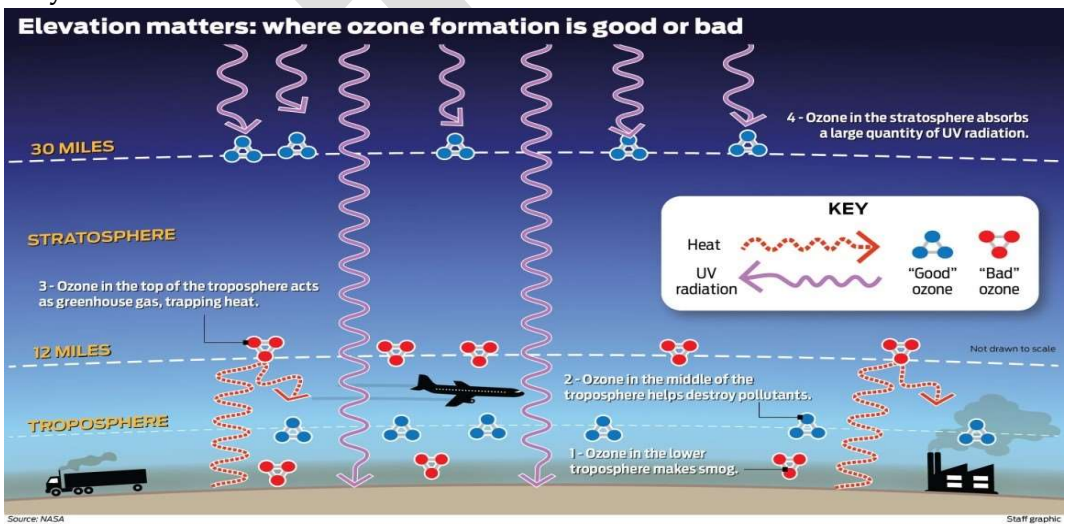
**2. Investigate the phenomenon of ozone depletion in the stratosphere. Discuss the role of ozone-depleting substances, their sources, and the environmental and health impacts of a depleted ozone layer. Evaluate international efforts and agreements aimed at addressing this issue. 20**

**Answer:**

**Introduction:**

Ozone is a gas that occurs both in the Earth's upper atmosphere and at ground level. It is a special form of oxygen molecule that contains three oxygen atoms with **formula O3.** Most atmospheric ozone is concentrated (**about 90%)** in a layer in the **stratosphere**, **about 9 to 18 miles (15 to 30 km) above the Earth's surface.**

**Body**

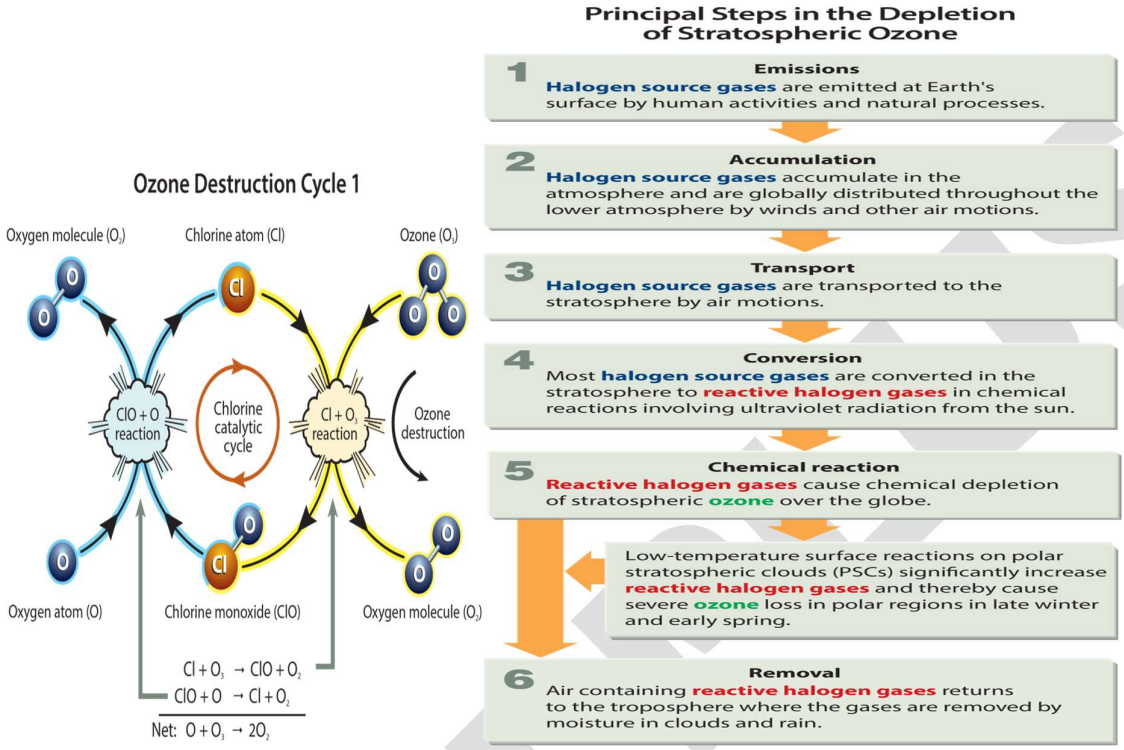



**Phenomenon of ozone depletion in the stratosphere**

- Ozone depletion is caused by the release of chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODS), which were **used widely as refrigerants, insulating foams, and solvents.**
- Other chemicals that damage the ozone layer include **methyl bromide (used as a pesticide) and halons (used in fire extinguishers).** As methyl bromide and halons are broken apart, they

release **bromine atoms**, which are **40 times more destructive to ozone molecules than chlorine atoms.**

- Depletion of the Ozone Layer occurs globally, but the severe depletion of the Ozone Layer over the Antarctic is often referred to as the 'Ozone Hole'. Increased depletion has recently started occurring over the Arctic as well.




**Role of ozone-depleting substances:**

- **Effects on human health-** sunburns, cataracts, aging or also to a weak immune system
- **Increased tropospheric ozone-** leads to health issues.
- **Increased vitamin D production**- can cause severe health conditions and can also increase the probability of mortality.
- **Change in biogeochemical cycles**- can alter sources and sinks of greenhouse gases and thus can indirectly contribute to the global warming issue.
- **Effects on marine life**- can harm the growth of plankton. A decrease in plankton will therefore lead to a disruption of the whole marine food chain.
- **Effects on animals-** animals can also suffer from skin cancer and additional diseases caused by UVB radiation.
- **Effects on plants-** can have an adverse effect on the growth of plants.
- **Effects on crops**- UVB radiation is known to be able to change parts of the plant's DNA. This may lead to reduced crop yields or other issues related to it.

**International efforts and agreements**

**Vienna Convention for the Protection of the Ozone Layer**: This was formalized in the Vienna Convention for the Protection of the Ozone Layer, which was adopted and signed by 28 countries, on 22 March 1985.

**The Montreal Protocol and Kigali Agreement**: **The Montreal Protocol on Substances that Deplete the Ozone Layer** is considered the world's most successful international environmental treaty. It was adopted on 16 September 1987 and entered into force in 1989.

**Kigali agreement**: A landmark agreement was reached October **15, 2016, at the 28thMeeting** of the Parties of the Montreal Protocol in Kigali, Rwanda, to phase down **hydrofluorocarbons (HFCs).** On January **1, 2019, the Kigali Amendment entered into force.** HFCs are not **harmful to the ozone layer**, but a fast-growing source of potent **greenhouse gases contributing to climate change.**

**Conclusion**

Ozone is expected to remain depleted for many more decades, causing the oceans to continue to warm and glaciers to continue to melt. The longer ozone remains depleted, the warmer the oceans will become, and the longer Earth's warmer climate will persist.

**3. Define the 7 layers of cybersecurity. What are vulnerability, its types, threats and harmful acts? 20**

**Answer:**

**Introduction**

Cybersecurity is the practice of protecting systems, networks, and programs from digital attacks. These cyberattacks are usually aimed at accessing, changing, or destroying sensitive information; extorting money from users through ransomware; or interrupting normal business processes.

**Body**

**7 layers of cybersecurity**

**1. Mission-Critical Assets**

This is data that is absolutely critical to protect. Whether businesses would like to admit it or not, they face malicious forces daily. The question is how are leaders dealing with this type of protection? And what measures have they put in place to guard against breaches?

An example of mission-critical assets in the Healthcare industry is Electronic Medical Record (EMR) software. In the financial sector, its customer's financial records.

**2. Data Security**

Data security is when there are security controls put in place to protect both the transfer and the storage of data. There has to be a backup security measure in place to prevent the loss of data, This will also require the use of encryption and archiving.

Data security is an important focus for all businesses as a breach of data can have dire consequences.

**3. Endpoint Security**

This layer of security makes sure that the endpoints of user devices are not exploited by breaches. This includes the protection of mobile devices, desktops, and laptops.

Endpoint security systems enable protection either on a network or in the cloud depending on the needs of a business.

**4. Application Security**

This involves the security features that control access to an application. It also includes the internal security of the app itself. Applications are designed with security measures that continue to provide protection when the app is in use.

**5. Network Security**

This is where security controls are put in place to protect the business's network. The goal is to prevent unauthorized access to the network. It is crucial to regularly update all systems on the business network with the necessary security patches, including encryption.

**6. Perimeter Security**

This security layer ensures that both the physical and digital security methods protect a business as a whole. It includes things like firewalls that protect the business network against external forces.

**7. The Human Layer**

Despite being known as the weakest link in the security chain, the human layer is a very necessary layer. It incorporates management controls and phishing simulations as an example.

These human management controls aim to protect that which is most critical to a business in terms of security. This includes the very real threat that humans, cyber attackers, and malicious users pose to a business.


- **Unpatched Software**: Software that is not regularly updated or patched presents significant vulnerabilities.
- **Zero-day Vulnerabilities:** Zero-day vulnerabilities are previously unknown flaws that are exploited before developers have a chance to address them. These vulnerabilities require a proactive defense strategy.
- **Hardware vulnerabilities** arise from physical or design flaws in hardware components. Mitigating hardware vulnerabilities can be challenging and may require physical modifications or firmware updates.
- **Network vulnerabilities** exist in the infrastructure and protocols that govern internet and network communications. Weaknesses in network architecture, such as unsecured Wi-Fi networks or outdated encryption protocols.
- **Misconfigurations** occur when security settings are not correctly implemented, leaving systems exposed. Automated configuration and regular updates to security settings can help minimize these risks.

**Types of Cybersecurity:**

| | Perception layer | Network layer | Service layer | Application layer |
|---|---|---|---|---|
| Components | • Barcodes<br>• RFID tags<br>• RFID reader-writers<br>• Intelligent sensors, GPS<br>• BLE devices | • Wireless sensor networks (WSNs)<br>• WLAN<br>• Social networks<br>• Cloud network | • Service management<br>• Database<br>• Service APIs | • Smart applications and management<br>• Interfaces |
| Security threats & vulnerabilities | • Unauthorized access<br>• Confidentiality<br>• Availability<br>• Noisy data<br>• Malicious code attacks | • Denial of Services (DoS)<br>• Routing attack<br>• Transmission threats<br>• Data breach<br>• Network congestion | • Manipulation<br>• Spoofing<br>• Unauthorized access<br>• Malicious information<br>• DoS attacks | • Configuration threats<br>• Malicious code (Malware) attacks<br>• Phishing Attacks |


**Conclusion**

Cybersecurity is the practice of protecting systems, networks, and programs from digital attacks. These cyberattacks are usually aimed at accessing, changing, or destroying sensitive information; extorting money from users via ransomware; or interrupting normal business processes.

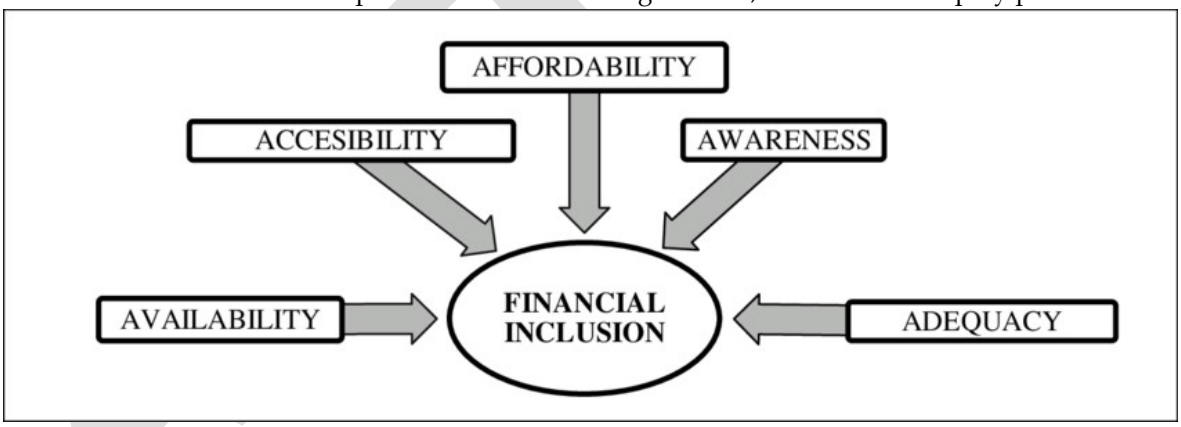
Implementing effective cybersecurity measures is particularly challenging today because there are more devices than people, and attackers are becoming more innovative.

**4. What is financial inclusion? Why is it important in the context of the goal of inclusive development? Name some policies that have been put in place to achieve financial inclusion in India. 20**

**Answer:**

**Introduction**

**Financial inclusion** is defined as the **process of ensuring access to financial services** and products needed by vulnerable groups (such as weaker sections) and low-income groups at an affordable cost. It offers various financial services and products such as banking services, insurance and equity products.




According to the RBI, as measured by its 'FI-Index', financial inclusion improved by 24% between March 2017 and March 2021. The FI-Index gives the highest weightage to the use of various financial services (45%), followed by access (35%) and quality (20%).

**Body**

**Importance of Financial Inclusion:**

- **Reduces poverty and inequality.** Financial inclusion provides opportunities for marginalized and low-income individuals to access formal financial services, such as savings, credit, and insurance.
    - By empowering them with the tools to manage their finances and invest in income-generating activities.

- **Promotes economic growth.** Increased financial inclusion leads to higher levels of savings, investment, and entrepreneurship, fostering economic growth and stability in both local communities and national economies.
- **Promotes small businesses.** Financial inclusion through innovative lending models and online platforms can provide much-needed funding for entrepreneurs to grow their businesses.
- **Empowers otherwise marginalized demographics.** For example, financial inclusion initiatives targeted at women can promote gender equality and women's economic empowerment.
    - By providing access to financial services, women gain more control over their finances, which can lead to improved educational opportunities, better health outcomes, and increased decision-making power within households.
- **Promotes innovation.** Financial inclusion drives innovation in the financial sector, leading to the development of new technologies and fintech solutions that cater to the needs of underserved populations.


**Policies to achieve Financial Inclusion in India:**

**Pradhan Mantri Jan Dhan Yojana (PMJDY):** It is one of the flagship schemes of the government to ensure the financial inclusion of those individuals who do not have a bank account. The scheme offers various financial services, including basic savings & deposit accounts, insurance, pension, remittance, and credit, in an affordable manner.

**Stand Up India Scheme:** Launched in 2016, the scheme aims to promote entrepreneurship among scheduled castes/scheduled tribes and women by offering bank loans worth between Rs. 10 lakhs and Rs. 1 crore to at least one SC/ST borrower and one-woman borrower per bank branch of Scheduled Commercial Banks.

**Pradhan Mantri Mudra Yojana (PMMY):** Launched in 2015, the scheme aims to provide term loans and working capital loans with a corpus of Rs. 3000 crore to small businesses dealing in manufacturing, trading, and services sectors, including the agriculture sector.

**Pradhan Mantri Suraksha Bima Yojana (PMSBY):** Launched in 2015, like the PMJJBY scheme, the PMSBY scheme offers a renewable one-year accidental death-cum-disability cover to all subscribing bank holders (aged 18-70).

**Sukanya Samriddhi Yojana:** It is a government-backed savings scheme for the welfare of girl children. It's designed to help parents save for their daughter's higher education and marriage

**Varishtha Pension Bima Yojana (VPBY):** It is a scheme for the benefit of senior citizens aged 60 years and above. The scheme is being administered through Life Insurance Corporation of India (LIC). It will remain

open for a period of one year from the date of launch.

**Conclusion:**

By targeting bottom of the pyramid, financial inclusion will not only help promote financial stability but also broaden the country's socioeconomic growth. This will also enable the participating institutions such as banks, NBFCs and insurance companies to improve their customer base and expand into the rural sector. By leveraging technology and support through proper grievance redressal systems, financial inclusion can reduce income inequality and serve the underprivileged and the underserved.

**5. India can realize its potential GDP only if the bottlenecks in the path can be overcome. Comment. 20**

**Answer:**

**Introduction**

Potential gross domestic product (GDP) is defined in the **OECD's Economic Outlook publication** as the level of output that an economy can produce at a constant inflation rate. Although an economy can temporarily produce more than its potential level of output, that comes at the cost of rising inflation.

Potential output depends on the capital stock, the p**otential labor force (which depends on demographic factors and on participation rates),** the non-accelerating inflation rate of unemployment (NAIRU), and the level of labor efficiency.

**Body**

**According to the International Monetary Fund (IMF),** India's GDP growth is likely to moderate from 8.2 percent in 2023 to 7 percent in 2024 and 6.5 percent in 2025 because the pent-up demand accumulated during Covid has exhausted, as the economy reconnects with its potential.

**Key Bottlenecks**

- **Income Inequality**: Income inequality in India is a persistent issue, with substantial disparities among different income groups, regions, and communities.
- **Job Creation**: India's demographic dividend, with a large and youthful population, presents both an opportunity and a challenge. The challenge lies in creating enough job opportunities to absorb the growing workforce. Insufficient job creation can lead to unemployment and underemployment.
- **Infrastructure Gaps**: While India has made significant strides in infrastructure development, there are still gaps in transportation, energy, healthcare, and education infrastructure. Efforts are underway to improve infrastructure through projects like "Smart Cities" and the development of industrial corridors.
- **Environmental Sustainability**: Rapid industrialization and urbanization have led to environmental challenges such as air and water pollution, deforestation, and depletion of natural resources.

**Strategies for Overcoming Bottlenecks**

- **Inclusive Growth**: Prioritizing inclusive growth involves policies and initiatives that ensure economic benefits reach all segments of society, including marginalized communities. Social safety nets, targeted welfare programs, and equitable access to healthcare and education can help reduce income inequality.
- **Infrastructure Investment:** Continued investment in infrastructure, including transportation, energy, and digital connectivity, is vital for sustaining economic growth. Public-private partnerships (PPPs) can play a crucial role in financing and executing infrastructure projects.
- **Sustainability:** Sustainable practices, including the adoption of renewable energy sources and green technologies, are vital for mitigating environmental challenges.India has set ambitious renewable energy targets and is actively promoting solar and wind energy projects.

**Conclusion**

India's journey towards sustained economic growth and development is indeed dynamic and multifaceted. By focusing on inclusive growth, infrastructure development, education, sustainability, and innovation, India can harness its immense potential and overcome challenges to achieve long-term economic prosperity while safeguarding the well-being of its citizens and the environment.

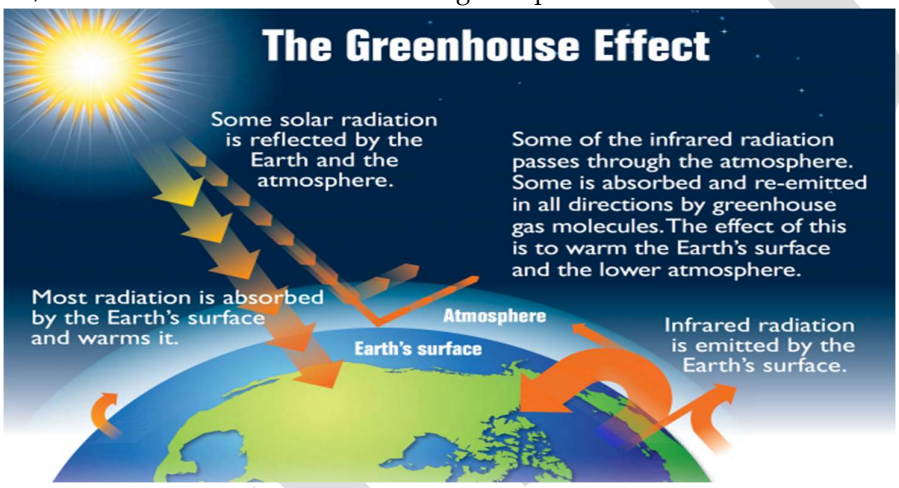
## GROUP B

**6. Discuss the role of greenhouse gases in climate change. Explain the sources of major greenhouse gases, their atmospheric behavior, and the mechanisms by which they contribute to global warming. Also, outline potential strategies to mitigate the impact of greenhouse gas emissions. 15**

**Answer:**

**Introduction**

**According to a 2023 Synthesis Report by the Intergovernmental Panel on Climate Change (IPCC),** "human activities, principally through greenhouse gas emissions, have unequivocally caused global warming. 'Greenhouse gases' are crucial to keeping our planet at a suitable temperature for life. Without the natural greenhouse effect, the heat emitted by the Earth would simply pass outwards from the Earth's surface into space, and the Earth would have an average temperature of about -20°C.




**Body**

**Role of greenhouse gases in climate change**

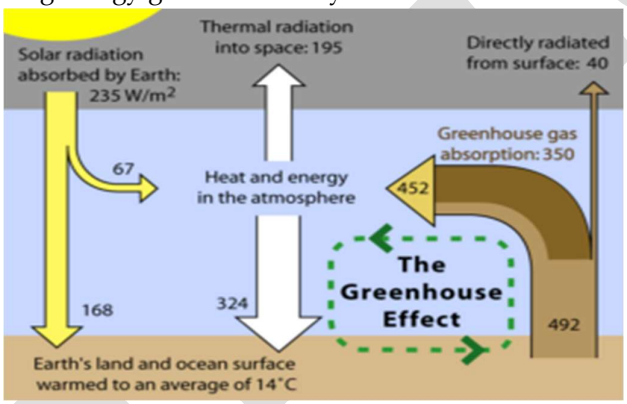
- **Higher temperatures increase heat-related illnesses** and make working outdoors more difficult. Wildfires start more easily and spread more rapidly when conditions are hotter.
- **Destructive storms have become more intense** and more frequent in many regions. As temperatures rise, more moisture evaporates, which exacerbates extreme rainfall and flooding, causing more destructive storms.
- **Climate change is changing water availability,** making it scarcer in more regions. Global warming exacerbates water shortages in already **water-stressed regions** and is leading to an increased risk of **agricultural droughts affecting crops, and ecological droughts** increasing the vulnerability of ecosystems.
- **As the ocean warms, its volume increases** since water expands as it gets warmer. Melting ice sheets also cause sea levels to rise, threatening coastal and island communities.
- **Climate change poses risks to the survival of species on land and in the ocean**. These risks increase as temperatures climb. Exacerbated by climate change, the world is losing species at a rate 1,000 times greater than at any other time in recorded human history.
    - **One million species are at risk of becoming extinct** within the next few decades. Forest fires, extreme weather, and invasive pests and diseases are among many threats related to climate change.

**Sources, behaviour and mechanism of major greenhouse gases**

Greenhouse gases, such as carbon dioxide, methane, nitrous oxide, and certain synthetic chemicals, trap some of the Earth's outgoing energy, thus retaining heat in the atmosphere.

- **Electricity production:** Electricity production generates the largest share of greenhouse gas emissions. Approximately 67 percent of our electricity comes from burning fossil fuels, mostly coal and natural gas.
- **Transportation:** Greenhouse gas emissions from transportation come from burning fossil fuel for cars, trucks, ships, trains, and planes. Over 90 percent of the fuel used for transportation is petroleum-based, which includes gasoline and diesel.
- **Industry:** Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy, as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials.
- **Commercial and Residential:** Greenhouse gas emissions from businesses and homes arise primarily from fossil fuels burned for heat, the use of certain products that contain greenhouse gases, and the handling of waste.
- **Agriculture:** Greenhouse gas emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.

**Mechanism of the Greenhouse Effect:** The incoming solar energy from the sun is redirected back towards space by the atmosphere and clouds and then some of the solar energy gets absorbed by the atmosphere and clouds. And the remaining energy gets absorbed by the Earth's surface making it warm.




**Potential strategies to mitigate the impact of greenhouse gas emissions**

- **Reduce Greenhouse Gas Emissions**: **Shift from fossil fuels to renewable energy** sources such as solar, wind, and hydroelectric power. **Improve energy efficiency** in industries, transportation, and buildings to reduce overall emissions.
- **Invest in Adaptation and Resilience**: Develop and implement resilient infrastructure to withstand the impacts of climate change, such as rising sea levels and extreme weather events.
- **Invest in Adaptation and Resilience**: Develop and implement resilient infrastructure to withstand the impacts of climate change, such as rising sea levels and extreme weather events. **Encourage collaboration between scientists, policymakers, and communities** to bridge knowledge gaps and ensure comprehensive strategies.
- **Innovation and Technology:** Invest in the development of innovative technologies that can help in carbon capture, sustainable agriculture, and climate-resilient solutions.

**Conclusion:**

The effects of global warming are becoming increasingly evident in our world today. Rising temperatures, melting ice caps, and extreme weather patterns are all signs of the impact of human activities on the environment. It is essential for governments, corporations, and individuals to take action to reduce carbon emissions and mitigate the effects of climate change.

**7. The Environmental Protection Act of 1986 has now turned into a toothless tiger. Comment. 15**

**Answer:**

**Introduction**

The Environment (Protection) Act was enacted in the year 1986. It was enacted with the main objective to provide the protection and improvement of environment and for matters connected therewith. The Act is one of the most comprehensive legislations with a pretext to protection and improvement of the environment.

The Constitution of India also provides for the protection of the environment. Article 48A of the Constitution specifies that the State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country. Article 51 A further provides that every citizen shall protect the environment.

**Body**

**Reasons Why the Act is Considered a 'Toothless Tiger'**

- **Weak Enforcement and Monitoring**:
  - The Act has strong provisions on paper, but enforcement remains weak. Regulatory bodies lack the manpower, resources, and expertise to monitor compliance effectively.
  - Violations of environmental norms often go unchecked, and offenders rarely face strict consequences, making the Act ineffective in deterring pollution.
- **Political and Industrial Pressure**:
  - There is a perception that enforcement is compromised by political interference and pressure from powerful industrial lobbies. Environmental regulations are sometimes diluted to promote economic growth, undermining the Act's effectiveness.
  - The fines and penalties imposed under the Act are minimal, failing to deter large corporations from violating environmental norms.
- **Delay in Judicial Processes**:
  - Environmental cases often face delays in the judiciary, with lengthy litigation processes making it hard to secure timely justice. This reduces the immediate impact of the law and discourages effective compliance.
  - Even when penalties are imposed, the delay in execution diminishes the perceived strength of the Act.
- **Lack of Public Awareness and Participation**:
  - Public participation and awareness regarding environmental issues remain limited. The Act does not adequately empower local communities or citizens to take part in decision-making or enforcement.
  - This lack of community involvement contributes to inadequate monitoring and lack of accountability.
- **Outdated Provisions**:
  - The Act, enacted in 1986, has not kept pace with emerging environmental challenges like climate change, plastic pollution, e-waste, and loss of biodiversity. The outdated provisions make it difficult to address modern environmental issues comprehensively.
  - Although amendments have been proposed, changes have often been slow and insufficient to tackle current environmental threats.

**Counter-Arguments: Why the Act Still Has Teeth**

- **Legal Framework for Environmental Protection**:
  - The Act remains a legal framework for environmental protection, providing a foundation for other environmental laws and policies in India. It enables the government to set standards for emissions, effluents, and hazardous substances.
  - It has played a role in creating institutions like the Central Pollution Control Board (CPCB) and State Pollution Control Boards, which have been instrumental in monitoring and implementing environmental standards.
- **Recent Amendments and Initiatives**:

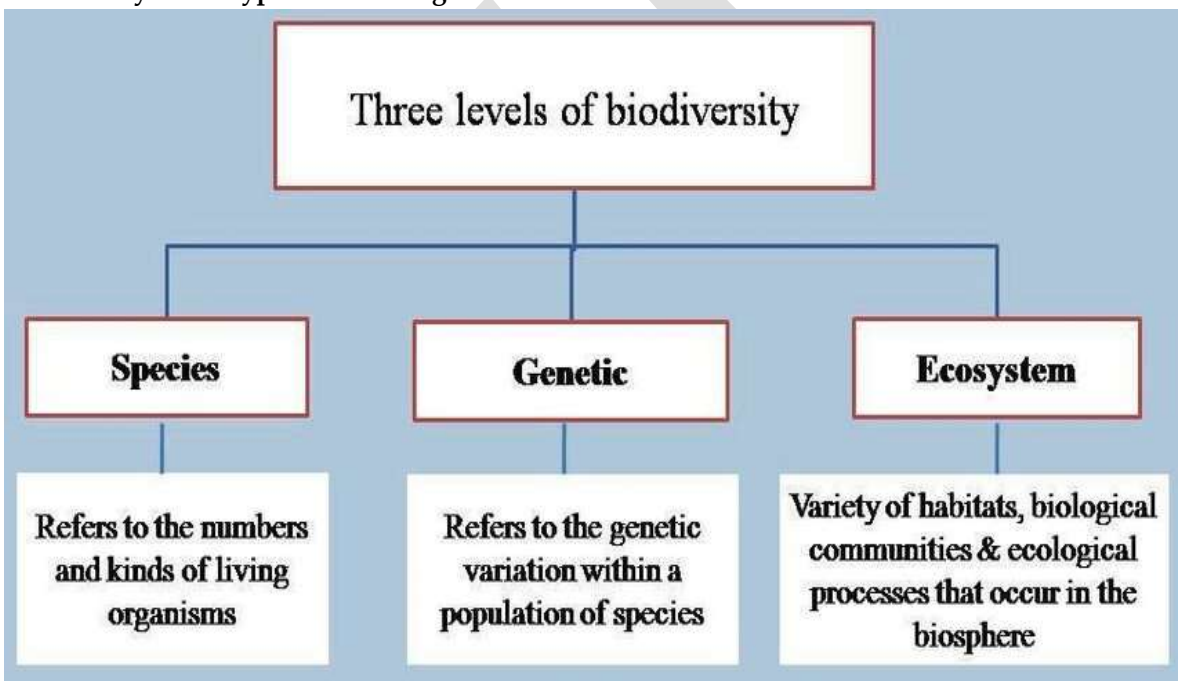
- There have been recent efforts to strengthen the Act, including amendments focused on pollution control, solid waste management, and stricter penalties for violators.
- New rules regarding environmental impact assessments (EIA) and waste management are steps in the right direction, showing that the Act can still be updated to stay relevant.

- **Legal Recourse for Activists**:
  - The Act provides a basis for legal actions by environmental activists and NGOs, who have used the provisions to hold polluters accountable. Public Interest Litigations (PILs) based on the Act have led to landmark judgments that have enhanced environmental protections.

**Conclusion:**
The EIA process recommends mitigation measures to reduce or prevent significant adverse environmental effects. These measures include project design or location changes, environmental management plans, and monitoring and reporting requirements.

**8. Explain biodiversity with respect to its types at all biological levels. Discuss different patterns of biodiversity. 15**
**Answer:**
**Introduction**
**'Biological diversity' or biodiversity** is that part of nature which includes the differences in genes among the individuals of a species, the **variety and richness** of all the plant and animal species at different scales **in space, locally, in a region**, in the country and the world, and various types of ecosystems, both terrestrial and aquatic, within a defined area.

**Body**
**Biodiversity for its types at all biological levels:**




Biological diversity deals with the degree of nature's variety in the biosphere. **This variety can be observed at three levels;** the genetic variability within a species, the variety of species within a community, and the organisation of species in an area into distinctive plant and animal communities constitutes ecosystem diversity.
**Genetic diversity:** Each member of any animal or plant species differs widely from other individuals in its genetic makeup because of the large number of combinations possible in the genes that give every

individual specific characteristics. Thus, for example, each human being is very different from all others.

**Species diversity:** The number of species of plants and animals that are present in a region constitutes its species diversity. This diversity is seen both in natural ecosystems and in agricultural ecosystems. Some areas are more rich in species than others.

**Ecosystem diversity:** There are a large variety of different ecosystems on earth, which have their own complement of distinctive inter linked species based on the differences in the habitat. Ecosystem diversity can be described for a specific geographical region, or a political entity such as a country, a State or a taluka.

**Different patterns of biodiversity**

- **Seasonal Pattern:** During different seasons, the diversity of species varies. In the rainy season, the diversity of insect species increases and decreases during winter. Bird diversity is related to the migratory activity and breeding season.
- **Successional Pattern:** After a disturbance, plants and animal species begin to reoccupy the habitat. They grow and get replaced by other species. This pattern of the temporal shift in the species composition of a community is called succession.
- **Evolutionary Pattern:** Over 600 million years of animal evolution, increasing biodiversity have been found over each regime and era. Some animals have been extinct, some are still found as living fossils, and some are represented as missing links or existing links in the history of evolution.

**Conclusion:**

Biodiversity is essential for maintaining the ecological system of our planet. Rich biodiversity is a sign of a healthy environment. Conservation of biodiversity is vital for the survival of human beings as well as other living beings on Earth.

**9. What is flood? What are flood forecasting and warning systems? Give the details of warning about landslide hazards and Geological Survey of India (GSI). 15**

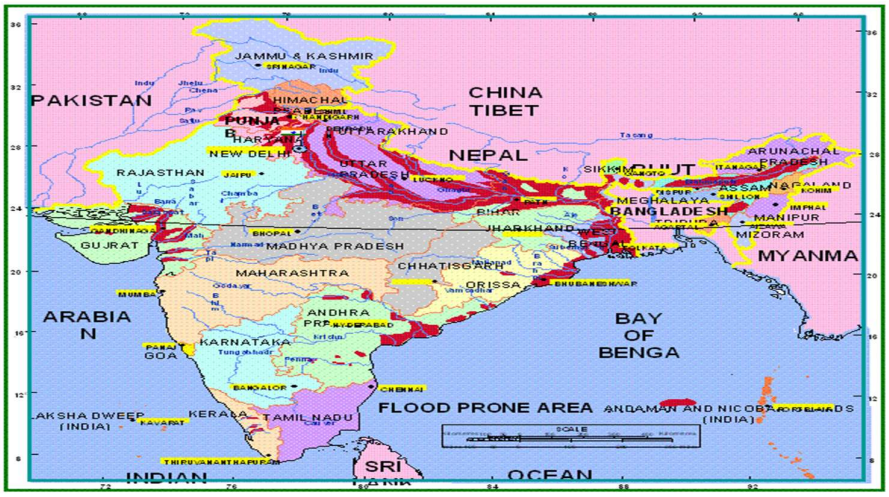
**Answer:**

**Introduction**

Floods are the most frequent type of natural disaster and occur when an overflow of water submerges land that is usually dry. Floods are often caused by heavy rainfall, rapid snowmelt or a storm surge from a tropical cyclone or tsunami in coastal areas.

Floods can cause widespread devastation, resulting in loss of life and damages to personal property and critical public health infrastructure. Between 1998-2017, floods affected more than 2 billion people worldwide.

**Body**



**Flood forecasting and warning system**

A flood forecasting and warning system provides the information necessary to improve decision support for the operation of structures. Some agencies may have arrangements for technical support or financial assistance with international organizations or with other countries.

- **Planting Mangroves**: In order to prevent coastal flooding, State Governments must actively take part in planting more mangroves in coastal areas. Mangroves act as a robust barrier against floods. Hence, governments must focus on mangrove conservation in coastal areas.
- **Optimizing Technology:** Advancement in technology can help to predict floods. Here, using intelligent flood warning systems like IFFLOWS can prove to be extremely beneficial.
- **Channelisation:** Channelisation is a deliberate attempt to alter the natural geometry of the river. Channelisation can be achieved in many ways. The river can be deepened and widened to increase the capacity of the channel.
- **Afforestation:** During heavy rains, trees reduce the risk of flooding. There are two major ways in which trees provide protection against flooding.

**Landslide**

- Landslides are more widespread than any other geological event and can occur anywhere in the world.
- They occur when large masses of soil, rocks, or debris move down a slope due to a natural phenomenon or human activity.
- Mudslides or debris flows are also a common type of fast-moving landslide.

Landslides can accompany heavy rains or follow droughts, earthquakes or volcanic eruptions. Areas most vulnerable to landslides include:

- steep terrain, including areas at the bottom of canyons;
- land previously burned by wildfires;
- land that has been modified due to human activity, such as deforestation or construction;
- channels along a stream or river;
- any area where surface runoff is directed or land is heavily saturated.

**Consequences of Landslides**

- **Infrastructure disruption:** While landslides have a very small and localized area of direct influence, roadblocks, railway line destruction, and channel clogging caused by rock falls have far-reaching consequences.
- **River Channel Diversion:** River channel diversion caused by landslides can result in flooding and loss of lives and property.
- **Difficult Spatial Interaction:** It also makes spatial interaction difficult, unsafe, and expensive, which has a negative impact on development operations in these locations.

**Landslide Hazards and Warnings**

- **Retaining Walls:** By preventing soil movement, retaining walls can offer support and stabilize slopes.
- **Slope Reinforcement:** To reinforce the slope and increase its resistance to sliding, techniques such as soil nailing, ground anchors, and geosynthetics (e.g., geotextiles, geogrids) can be utilized.
- **Drainage Systems:** Effective drainage systems are essential for regulating water flow and lowering excess pore water pressure on slopes.
- **Terracing:** Terracing is the process of establishing a succession of level platforms or steps on slopes in hilly or mountainous areas.

**The Geological Survey of India (GSI)** is a scientific organisation under the Ministry of Mines that is responsible for conducting geological surveys and research in India. The GSI was established in 1851 by the British colonial government to map the mineral resources of the country.

- The GSI has played a vital role in the development of the country by providing valuable information on the geology and mineral resources of India.

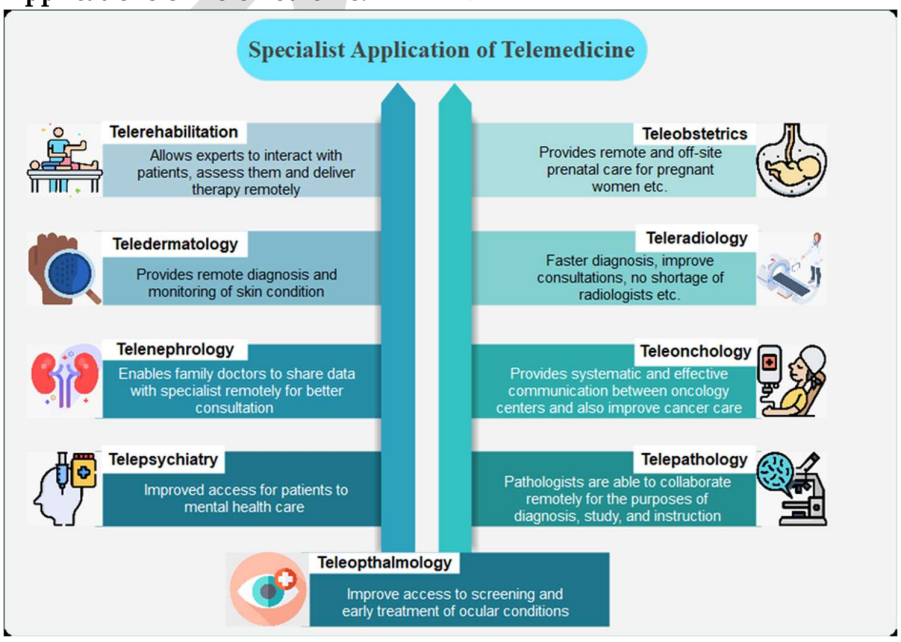
- It has also **contributed to the understanding of the earth's history, evolution, and dynamics.**
- Mapping the entire country at different scales and producing thematic maps on various geological aspects.
- **Discovering and assessing the mineral potential** of various regions and commodities, such as coal, iron ore, manganese, bauxite, copper, gold, diamond, uranium, thorium, rare earth, etc.
- **Exploring the continental shelf and deep sea areas** of India and identifying potential resources and hazards.

**Conclusion:**
The continuation of the Flood Management and Border Areas Programme is a testament to the government's commitment to safeguarding the lives and livelihoods of citizens in flood-prone areas. By providing substantial financial assistance and promoting innovative approaches, the FMBAP will empower states to effectively manage flood risks and build resilient communities.

**10. Illustrate telemedicine. Describe its purpose and applications. 15**
**Answer:**
**Introduction**
**Telemedicine is the use of information and communication technologies** to improve patient outcomes by increasing access to healthcare and medical information. It is considered to be the **tool of remote diagnosis and treatment** of patients by the use of technology. The Indian Government has adopted the definition of telemedicine provided by the **World Health Organization ("WHO"),** as follows.
**Telemedicine has the potential** to increase access to quality healthcare for all Indians, given that India suffers from a low **doctor-to-patient ratio with only one doctor for every 1,445 Indians**. This hampers the equitable distribution of healthcare services which has remained to be a major goal in public health management for years.
**Body**
**Purpose of Telemedicine:**

- It aims to assist medical practitioners in delivering effective and safe medical care, taking into account current information, available resources, and patient needs, while ensuring patient and provider safety.
- They provide discretion to healthcare practitioners (HCPs) to determine the correct course of action when consulting patients over telemedicine.

**Applications of Telemedicine:**



- **Primary Care and Consultations**:
  - Routine medical consultations for minor illnesses, prescription refills, and preventive care.
  - Remote triage and assessment of symptoms to determine the need for in-person visits.
- **Specialist Consultations**:
  - Access to specialty care, such as cardiology, dermatology, and mental health services, regardless of geographical location.
  - Collaboration between primary care providers and specialists for comprehensive patient management.
- **Chronic Disease Management**:
  - Remote monitoring and management of chronic conditions, including diabetes, hypertension, and respiratory diseases.
  - Regular check-ins, medication management, and lifestyle counseling to improve patient outcomes.
- **Emergency and Urgent Care**:
  - Remote evaluation and triage of urgent medical conditions, reducing emergency department visits and hospital admissions.
  - Expedited access to care for acute illnesses and injuries, including telestroke and teletrauma services.

**Benefits of Telemedicine:**

- **Increased Access to Healthcare**:
  - Overcomes geographical barriers, particularly in rural and underserved areas.
  - Improves access for individuals with mobility limitations or transportation challenges.
- **Convenience and Efficiency**:
  - Eliminates travel time and waiting room delays, enhancing patient convenience.
  - Reduces healthcare costs associated with transportation and missed workdays.
- **Improved Continuity of Care**:
  - Seamless coordination between primary care providers, specialists, and other healthcare professionals.
  - Enhanced communication and information sharing facilitate comprehensive and personalized care.

**Regulatory Framework Governing Telemedicine in India**

The practice of telemedicine is regulated by various laws and guidelines to ensure patient safety, data protection, and ethical standards. The key components of the regulatory framework include:

- **National Medical Commission Act, 2019 (NMC Act):** Provides overarching regulations for medical practice, including telemedicine, by establishing the National Medical Commission.
- **Telemedicine Practice Guidelines (TPG) Issued under the MCI Code:** Offers specific guidelines for telemedicine practice, outlining legal and ethical standards for healthcare professionals.
- **Drugs and Cosmetics Act, 1940 (D&C Act) and Drugs and Cosmetics Rules, 1945 (D&C Rules):** Regulates the sale and distribution of drugs, including those prescribed during teleconsultations.
- **Information Technology Act, 2000 (IT Act) and related rules:** Governs the use of electronic records, data protection, and intermediary liability in telemedicine platforms.

**Conclsuion:**

Addressing challenges related to the lack of integration of medical records across different healthcare providers to ensure care continuity and comprehensive patient management. Increasing awareness and education about telemedicine services among patients and healthcare professionals to promote its adoption and utilization.

**11. What is data privacy and its elements? Explain different types of data breaches. Define data linkage and profiling. 15**

**Answer:**

**Introduction**

Data privacy, also called "information privacy," is the principle that a person should have control over their personal data, including the ability to decide how organizations collect, store and use their data.

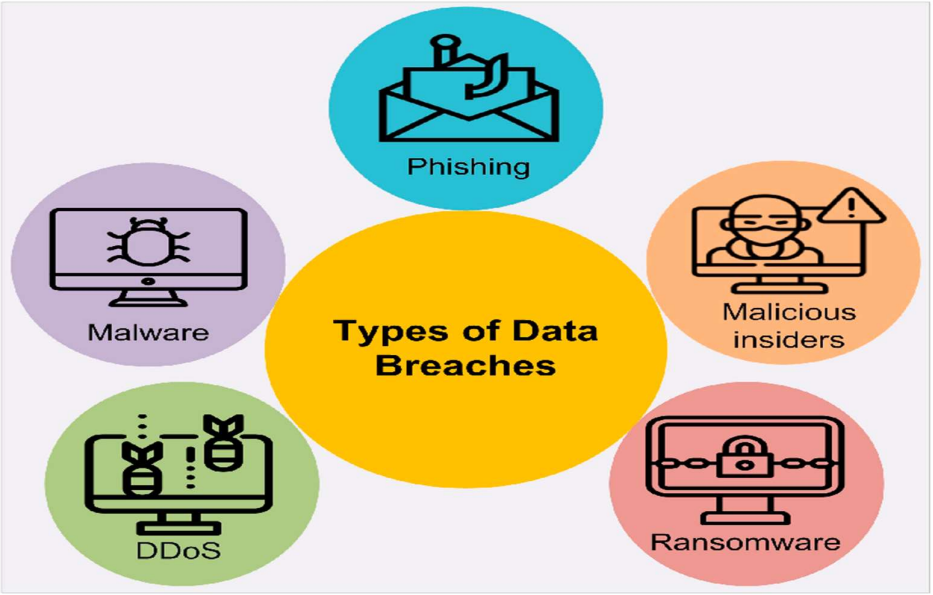
**Body**

**Data privacy is generally composed of the following six elements:**

- **Legal frameworks.** Prevailing legislation enacted and applied to data issues, such as data privacy laws.
- **Policies.** Established business rules and policies to protect employees and user data privacy.
- **Practices.** Best-practices put in place to guide IT infrastructure, data privacy and protection.
- **Third-party associations.** Any third-party organizations, such as cloud service providers, that interact with data.
- **Data governance.** Standards and practices used to store, secure, retain and access data.
- **Global requirements.** Any differences or variations of data privacy and compliance requirements among legal jurisdictions around the world, such as the U.S. and European Union (EU).

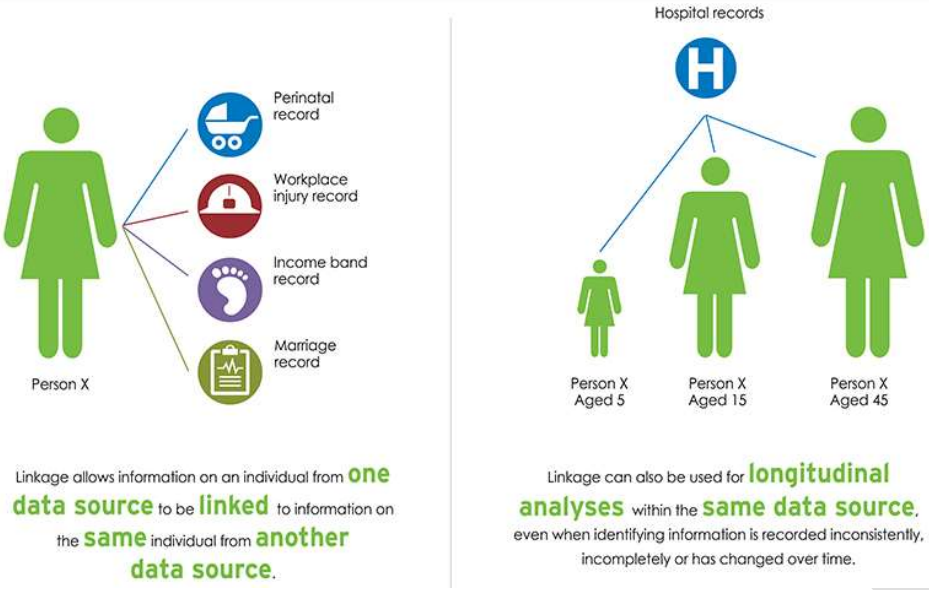
**Different Types of Data Breaches**

- **Malware attack:** This is the type of attack that computer users are probably the most familiar with. It involves tricking a user into installing malicious code into their system.
- **Phishing attack:** In a phishing attack, a malicious actor poses as a friendly entity in order to trick your user into providing them with unauthorized information.
- **SQL injection attack:** In this type of attack, the hacker sends a SQL query to the database using input data from the client to the server and inserts SQL commands into the data-plane input.




**Data linkage and profiling**

**Data linkage** is the activity of bringing together separate data sources by identifying and matching the same entity in each and then bringing those different sources of information together into a single dataset.




**Data Profiling** can be defined as the process of examining and analyzing data to create valuable summaries of it. The process yields a high-level overview that aids in

- discovering data quality issues,
- risks, and
- overall trends.

**Data Profiling** can eliminate costly errors that are common in databases. These errors include incorrect or missing values, values outside the range, unexpected patterns in data, etc. It involves the following processes:

- Collecting Descriptive Statistics such as minimum and maximum values, count of values, etc., along with any other attributes that can be used to describe the basic features of the data going through the Data Profiling process.
- Performing data quality assessment.
- Identifying data types, recurring patterns, etc.
- Tagging data with descriptions and keywords.
- Group data into categories.
- Identifying the metadata and its accuracy.

**Conclusion:**

With India moving towards digitization, a strong and efficient data protection law is required to enhance individual rights by providing full control over their personal data, while ensuring a high level of data protection.

**12. Critically examine the role of the Public Private Partnership (PPP) model for the infrastructure development of the country. Cite a few success stories. 15**

**Answer:**

**Introduction**

A public–private partnership (PPP, 3P, or P3) is a cooperative arrangement between two or more public and private sectors, typically **of a long-term nature.** In other words, it involves government(s) and business(es) that **work together to complete a project** .

The public and private stakeholders sign up to **jointly develop, finance, execute and operate a (mostly) infrastructure project**, and thus an entity called concessionaire is created (sometimes also called an SPV - special purpose vehicle).

**Body**

**Role of the Public Private Partnership (PPP) model for the infrastructure development:**

**1. Enhanced Efficiency and Innovation**

Private sector companies often bring innovative solutions and efficient project management practices to the table. This can lead to faster project delivery, reduced costs, and improved quality of infrastructure.

**2. Access to Capital**

PPPs provide access to private sector funding, reducing the financial burden on public budgets. This allows governments to undertake large-scale infrastructure projects without diverting funds from other essential services.

**3. Risk Sharing**

By distributing risks between public and private partners, PPPs can mitigate the financial and operational risks associated with complex infrastructure projects. This risk-sharing mechanism enhances project sustainability and resilience.

**4. Long-Term Sustainability**

PPPs often involve long-term contracts that ensure ongoing maintenance and operation of infrastructure. This long-term perspective promotes the sustainability and durability of assets, benefiting communities for years to come.

**Success Stories:**

- **Cochin International Airport is operated by Cochin International Airport Ltd. (CIAL),** a unique entity founded in 1994. It is the first green field airport in the country, build from scratch, with private participation and is thus a pioneer of the Indian airport public-private partnership (PPP) model.
- **Delhi International Airport is managed by the Delhi International Airport Limited (DIAL)** since 2006. Following an international completive bidding process, the concession to operate and develop Delhi airport was signed between Airport Authority in India (AAI) and Delhi International Airport Limited. The initial period of the concession is for 30 years.
- **Hyderabad Rajiv Gandhi International Airport is operated by the Hyderabad** International Airport Limited (HIAL) which signed a concession agreement with the Government of India in December 2004 for a period of 30 years. The inauguration of the airport was in March 2008.
- **Bangalore International Airport Limited (BIAL) designed, built, owns and operates (DBOO)** the Kempegowda International Airport. The concession agreement between the Government of India and BIAL was signed in July 2004 and the airport became operational in May 2008.
- **Massachusetts Port Authority (Massport)** is the major owner and operator of Boston Logan International Airport Terminal A, along with Delta Air Lines. The initial period of the concession is for 5 years (began on March 16,2005). Extension terms provided for 20 automatic one-year extensions unless Delta was in default.
- **John F. Kennedy International Airport Terminal 4 (JFK Terminal 4)** was the first major terminal to be managed by a foreign airport operator (Schiphol Group) in the United States. It is the only non-airline, privately-operated terminal at JFK.
- **Rio de Janeiro/Galeão–Antonio Carlos Jobim International Airport**, formerly known as Galeão International Airport, is the largest airport in Brazil in terms of total area and has been managed singlehandedly by the state owned company Empresa Brasileira de Infra-Estrutura Aeroportuaria (Infraero) until the government signed concession agreements in March 2010.
- **São Paulo/Guarulhos–Governador André Franco Montoro International Airport**, formerly known as Cumbica Airport, was officially inaugurated in January 1985. As one of the largest airports in Brazil, it transports more than 26 million passengers and records more than 250,000 aircraft movements annually.

**Conclusion:**

Public-Private Partnerships are a powerful tool for infrastructure development, combining the strengths of

both the public and private sectors to deliver high-quality, sustainable projects.
By leveraging the expertise, resources, and innovation of private sector partners, governments can address infrastructure challenges and improve public services. However, successful implementation of PPPs requires careful planning, strong governance, transparent processes, and continuous collaboration.

**13. The structural change in the Indian economy is a case of the `missing middle'. Do you think that this kind of structural change can help the economy in becoming a developed one? 15**

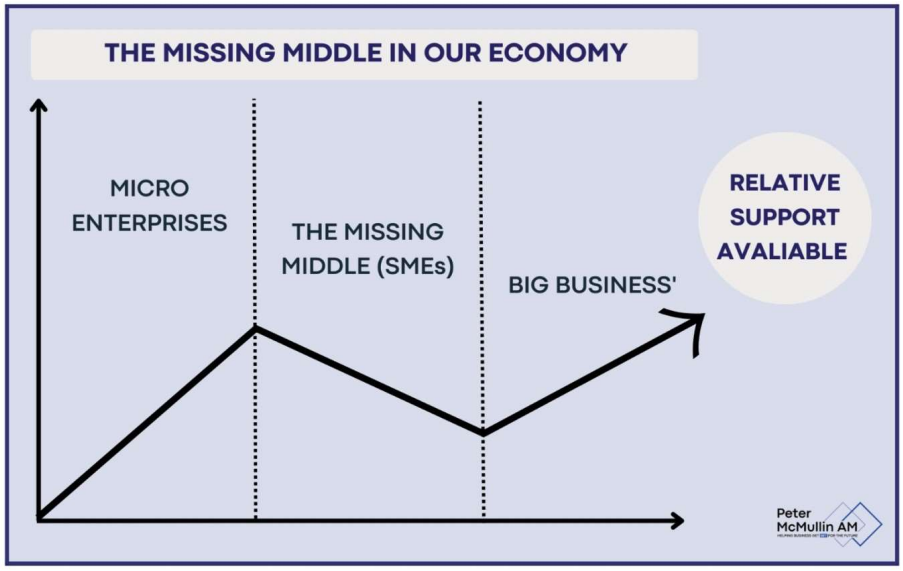
**Answer:**

**Introduction**

The term **"missing middle"** in the Indian economy refers to the structural gap between a few large, formal enterprises and a large number of small, informal businesses. It is a concept that holds that industries in developing nations such as India are controlled by a high number of small businesses and a few major corporations, but disproportionately few medium businesses.
In India, there is a lack of mid-sized firms that could drive employment, productivity, and innovation. This structural change raises important questions about the potential for India to become a developed economy.

**Body**

| Agree | Disagree |
|---|---|
| **Employment generation**: India has witnessed significant employment growth over the years. With the employment increased by nearly 36%, adding around 170 million jobs during 2016-17 and 2022-23. | **Stunted Growth of Small Businesses**: Non-availability of institutional finance, low level of research and development and delays due to multiple level of clearances are stunting growth of small and medium enterprises (SMEs) in the country. |
| **Innovation and Productivity Growth**: Productivity growth, driven by technology, efficiency, institutions, and the market, plays a prime role in accelerating economic growth. | **High Barriers to Entry for Mid-Sized Firms**: Lack of conducive policies, credit, and support can hinder small businesses from scaling to mid-sized firms. |
| **Improved Formalization**: India has been promoting the formalization of its economy since **2016, and the share of the formal sector in the economy has increased to 56%.** The government has taken several steps to formalize the economy. | **Quality of Jobs**: Without focus on job quality, increased mid-sized firms might lead to low wages and poor conditions, limiting living standards. |
| **More Balanced Growth**: Achieving high and sustainable **growth** has been subtle for **India**; success will require securing the demographic dividend, improving private investment. | **Limited Contribution to Global Competitiveness**: India's relatively low cost of labor is one of the strongest incentives for setting up shop there. Despite rising wages, India still remains one of the countries with a cheap labour force. |




**Conclusion**

Addressing the "missing middle" could help in moving towards a developed economy by creating jobs, innovation, and formalizing the economy, it is not a guaranteed pathway to development. A more holistic approach that includes strengthening the informal sector, reducing regulatory hurdles, improving infrastructure, and investing in education and skill development would be necessary for sustained and inclusive economic growth.

**14. Growth process in India has exacerbated rather than bridging the existing inequalities. Give your views with justifications. 15**

**Answer:**

**Introduction**

India's economic growth over the past few decades has been remarkable, transforming the country into one of the world's largest economies. However, this growth has been accompanied by increasing income inequality, with the rich benefiting disproportionately more than the poor. This widening gap between the rich and the poor poses a significant challenge to India's social stability, inclusive development, and long-term economic sustainability.

**Body**


Fig- Analysis of the Widening Gap between The Rich and the Poor

**Inequality in India**

- Unemployment had reached a 45-year high in 2017-18, as revealed by NSO's Periodic Labour Force Survey (PLFS).

- Two-thirds of people in India live in poverty: 8% of the Indian population lives on less than $2 a day.
- Over 30% even have less than $1.25 per day available - they are considered extremely poor.
    - This makes the Indian subcontinent one of the **poorest countries in the world**; women and children, the weakest members of Indian society, suffer the most.
- India is the second-most populous country after China with about 1.2 billion people and is the seventh-largest country in the world with an area of 3,287,000 km².
- The highly contrasted country has enjoyed growth rates of up to 10% over many years and is one of the largest economies in the world, with a gross domestic product (GDP) of 1,644 billion US dollars.
    - But **only a small percentage of the Indian population has benefited from this impressive economic boom so far**, as the majority of people in India are still living in abject poverty.
- According to a recently released Oxfam Report, income of 84% of households in the country declined in 2021.
- India is the **third largest number of billionaires in the world** after China and the United States, with more billionaires than France, Sweden and Switzerland combined.

**Way Ahead**

- **The growth of the population at the current rate should be checked** by the implementation of policies and awareness promoting birth control.
- All efforts should be made to **increase the employment opportunities in the country,** either by inviting more foreign investments or by encouraging self-employment schemes.
- Measures should be taken to **bridge the immense gap that remains in the distribution of wealth among different levels of society**. A 99% one-off windfall tax on the wealth gains of the 10 wealthiest men in Covid19 alone will generate $ 812 billion.
- Certain Indian states are more poverty stricken than others like Odisha and the North East states. Government should seek to **encourage investment in these states by offering special concessions on taxes.**
- Primary needs of people for attaining a satisfactory quality of life like food items, and clean drinking water should be available more readily.
- **Improvement of the Subsidy rates on commodities and the Public Distribution System** should be made.
- **Free high school education and an increased number of functioning health centres** should be provided by the government.

**Conclusion**

India has made significant strides in reducing multidimensional poverty, yet the persistent inequality among various caste groups remains a critical challenge. Despite constitutional provisions and affirmative action programs aimed at abolishing caste discrimination, economic realities continue to be shaped by these deep-rooted social structures. Effective policy interventions and focused efforts are essential to bridge these gaps and promote equitable economic growth.

**15. How does gender budgeting act as a strategy for achieving women's empowerment? 15**

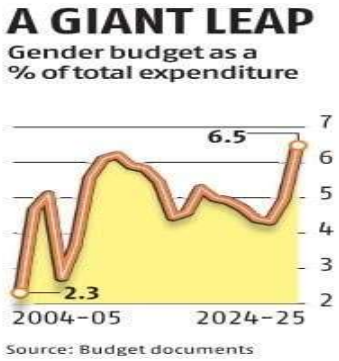
**Answer:**

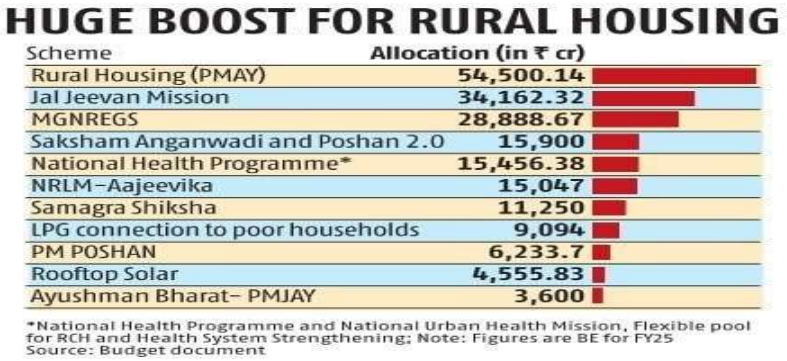
**Introduction**

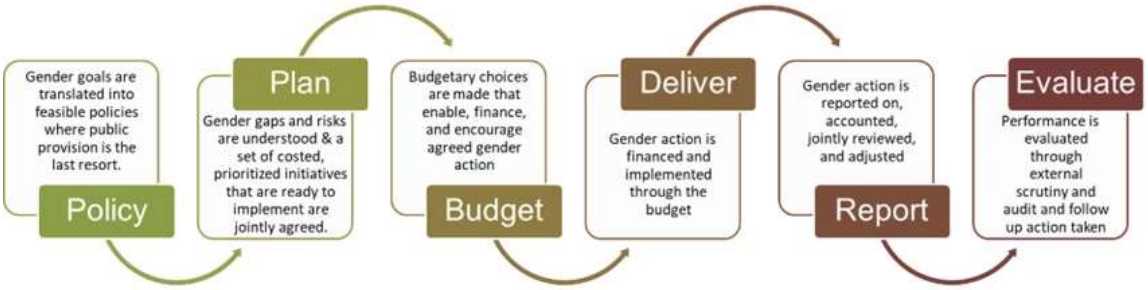
Gender budgeting is a strategy to achieve equality between women and men by focusing on how public resources are collected and spent.

The gender Budget (GB) **reached 1% of GDP estimates in 2024-25**. Allocations for pro-women programs **have now surpassed ₹3 lakh crore**. It represents an increase, with allocations to these schemes currently standing at approximately 6.8% of the total budget expenditure for 2024-25, a departure from the historical average of around 5%.

**Body**




**Challenges faced by women**

- **Women from all classes, religions, castes and ethnic backgrounds experience day to day life challenges in multiple ways.**
- Low levels of education & Skill, Healthcare services and facilities are not easily accessible to them.
- Experience high levels of violence at home and outside.
- Caste-based discrimination is faced even in urban area.
- **SCs, STs, and Muslim women lag behind in almost all key socio-economic indicators of development.**
- **Numerous socio-cultural, psychological and economic factors make them vulnerable and marginalised.**
- Windows experience alienation, social taboos, limited freedom to remarry, insecure property rights, social restrictions on living arrangements, restricted employment opportunities, emotional and other forms of violence and lack of social support.
- **Elderly Women face abuse, including physical abuse.**

**Strategy for achieving women's empowerment**

- Provide loans, infrastructure and market facilities for women's cooperatives and groups, and marketing of their products.
- **Recruit women into all levels of the police force, and increase their numbers in the police force**.
- Training and awareness programmes for women representatives in the Panchayati Raj institutions.
- **Review and update current schemes to assess their effectiveness in terms of social indicators.**
- **MGNREGS should be enhanced in Adivasi areas, with greater focus on works that empower women in direct and indirect ways.**
- Ensure safe migration and prevent trafficking.
- Effective implementation of the inter-state migration act and trafficking laws.

**Conclusion**

**Stricter laws are not enough, time bound disposal of justice essential to prevent Crimes against Women.** Need to address the special needs of single women such as widows, separated, divorced, never-married and deserted women including women-headed households and single women living within households.

**16. Odisha is the pioneering State in starting the Odisha Millets Mission. Discuss the rationale, objectives and major achievements of the programme. 15**

**Answer:**

**Introduction:**

The Government of Odisha launched the special programme for promotion of millets in tribal areas known as **Odisha Millet Mission (OMM) in 2017 with aim to Revive Millets on Farms and Plates** and simultaneously focus on production, processing, consumption, marketing and inclusion of millets in Government Schemes

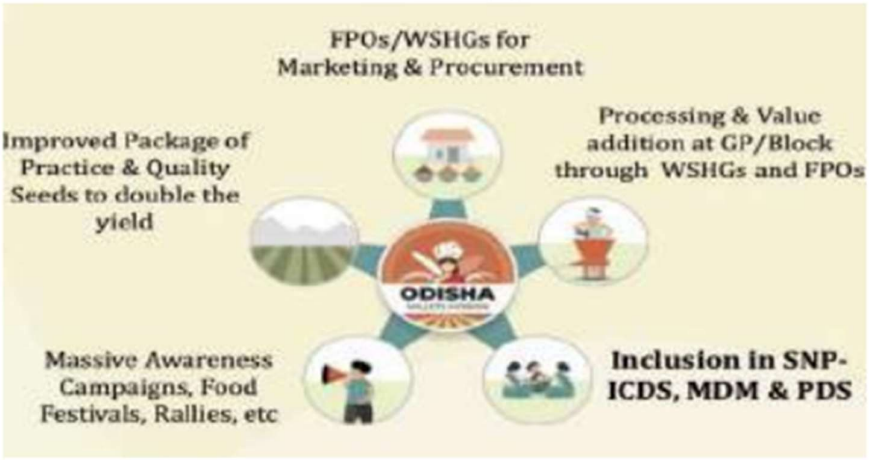
| |
|---|
| Data from NFHS-4 shows that Odisha ranks in the top 10 of the most affected States of under-five year child malnutrition on all the three indicators of wasting, stunting and underweight.<br>In terms of deprivations and marginalization, the State also has some of the highest proportion of tribals (24%) in the country with higher malnutrition levels with the relationship strongest for underweight children. |

**Body:**

**The objectives of OMM are as follows:**

- Promoting household level consumption
- Improving productivity of millet crops by improved agronomic practices
- Promoting FPOs for marketing
- Setting up decentralized processing unit
- Inclusion of millets in ICDS, MDM and PDS

Entire project is implemented by FPOs with support of local NGOs under the guidance of line departments at district and block level.




**Major achievements of the programme**

**Ragi was distributed under PDS to more than 50 lakh beneficiaries in 14 districts.** OMM envisages addressing both supply side and demand side aspects of millet use.

The initiative is unique as it leverages on a range of stakeholders in the farm and tribal development space, including community-based organizations, grassroot level NGOs and technical advisors.

- **Gross value of produce per farmer household increased over three times**, from Rs.3957 to 12486 during from 2018-19 to 2020-21.
- **Gross value of produce per hectare increased more than 2 times**, from Rs. 9447 to 20710, millet production per hectare increased over 2 times from 5.79 quintal/hectare (0.6MT/hectare) to 12.72 quintal/hectare (1.3 MT/hectare). Average area in hectare per farmer household increased from 0.42 hectare to 0.60 hectare per household from 2018-19 to 2020-21.

**Conclusion:**

The objective of Odisha Millets Mission is to revive millets on farms and on plates. Ragi procurement has

supported the consumption among people. As mentioned above, the procured ragi based entitlements were included in the PDS and ICDS Schemes. These efforts are set to be expanded through inclusion of ragi based preparations in MDM. Hence, the focus has been on the nutritionally vulnerable category of children.

**17. Jawaharlal Nehru termed heavy industries and plants as `Temples of Mother India'. Do you agree? 15**

**Answer:**

**Introduction**

Nehru's first commitment was to **make India a self-sufficient economy**. As a result, he set up temples of modern learning and giant public sector industries that catered to the needs of a growing nation and its people. His efforts to create a scientific temper can be seen from his zeal to establish higher centres of learning.

Nehru and most of his contemporaries believed that only large-scale industrialisation could really change the economy and enable India to be a player on the world stage as well as helping its own citizens. He saw them as the pillars that would support India's economic and social growth, akin to how temples are seen as pillars of culture and spirituality.

**Body:**

| Agree | Disagree |
|---|---|
| Heavy industries play an important role in **economic growth and development**, providing infrastructure, jobs, and technological advancements. | Excessive focus on heavy industries can lead to environmental degradation and pollution**. E.g.** The proportion of workforce in agriculture, which stood at 69.7% in 1951, remained stuck at 69.5% in 1961 and 69.7% in 1971. |
| Industrialization helps in **reducing dependence on foreign imports** and promotes self-reliance, promoting national pride. | Industrial growth can cause **social displacement and inequality**, as benefits are concentrated in certain sectors and regions. |
| **Large-scale industries serve as a foundation** for building a modern nation with advanced infrastructure and improved standards of living. | **Agriculture**, **small-scale industries, and sustainable development** may be neglected, affecting the broader population and rural areas. |
| **Investments in heavy industries** can create a robust industrial base that supports **defense, transport, and core sectors of the economy.** | A focus on **heavy industries can increase the wealth gap**, concentrating resources in the hands of a few while neglecting the informal and rural economy. |
| Nehru's vision of industrialization brought scientific and **technological progress** to India, leading to innovations and improved education. | **Heavy industry-centric policies** may lead to a lack of balance, with inadequate attention given to environmental sustainability and long-term impacts. |

**Conclusion:**

Nehru helped to ensure the deep rooting of fundamental values in the Indian polity, and tried to work out ways in which these could be expressed. His most positive influence and what he valued most of all, was the attempted construction of a plural, open, and democratic polity working for change in the lives of all citizens.

He used to speak of India as a composite nation, and of the ground-breaking experiment of trying to achieve socio-economic change by democratic processes and consent, in contrast to state-directed revolution with its risk of profound violence.