

Q.1) Consider the following statements with reference to the Initiative on Climate Action and Nutrition (I-CAN) :

1. Launched at the 27th session of UNFCCC in partnership with WHO, FAO and Global Alliance for Improved Nutrition.
2. The goal of I-CAN is to support member and non-member states in delivering climate change adaptation and mitigation policy action besides improving nutrition.

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

EXPLANATION:

Initiative on Climate Action and Nutrition (I-CAN) was officially launched at the “Adaptation and Agriculture” thematic day during the 27th session of the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP27) in Sharm El-Sheikh, 6-18 November 2022. I-CAN is a multi-stakeholder, multi-sectoral initiative that will be implemented with the support of UN agencies and partners, including the Food and Agriculture Organization (FAO) and the Global Alliance for Improved Nutrition (GAIN) and emphasizes pillars of action that consist of implementation, action and support, capacity building, data and knowledge transfer, policy and strategy, and investments. **So, Statement 1 is correct.**

The aspirational goal of I-CAN is to support only Member States in delivering climate change adaptation and mitigation policy action, which simultaneously improves nutrition and triggers transformative action to deliver healthy diets from sustainable food systems, thus contributing to achieving the global targets for SDG 13, SDG3 and SDG2. **So, Statement 2 is not correct.**

ADDITIONAL INFORMATION:

INITIATIVE ON CLIMATE ACTION AND NUTRITION (I-CAN)

- Objectives**
- To champion the need to connect actions to accelerate progress in climates (mitigation and adaptation) and nutrition.
 - To outline deliverables that will monitor progress in integrated action.
 - To facilitate technical and high-level support to Member States to achieve these deliverables.
 - To provide practical examples of what all stakeholders can implement to advance integrated action.
 - To outline what the convenors of this initiative will do to advance integrated action.
- Outcomes of I-CAN**
- Implementation, action and support.
 - Capacity building, data and knowledge transfer.
 - Policy and strategy.
 - Investments.

Q.2) Consider the following statements with reference to Global Methane Initiative(GMI) :

1. GMI was created in 2004 to achieve a global reduction in anthropogenic methane emissions.
2. India has been one of the members since its inception.
3. It is a voluntary Government and an informal international partnership among developing countries having economies in transition and underdeveloped countries.

Which of the statements given above is/are correct ?

- (a) **1 and 2 only**
- (b) 2 and 3 only

(c) 1 and 3 only

(d) 1,2 and 3

EXPLANATION:

The Global Methane Initiative (GMI) which was formed in 2004, is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a valuable energy source. The main aim of the forum is to achieve a global reduction in anthropogenic methane emissions. GMI provides technical support to deploy methane-to-energy projects around the world that enable Partner Countries to launch methane recovery and use projects. GMI focuses on three key sectors: Oil and Gas, Biogas, and Coal Mines. **So, Statement 1 is correct.**

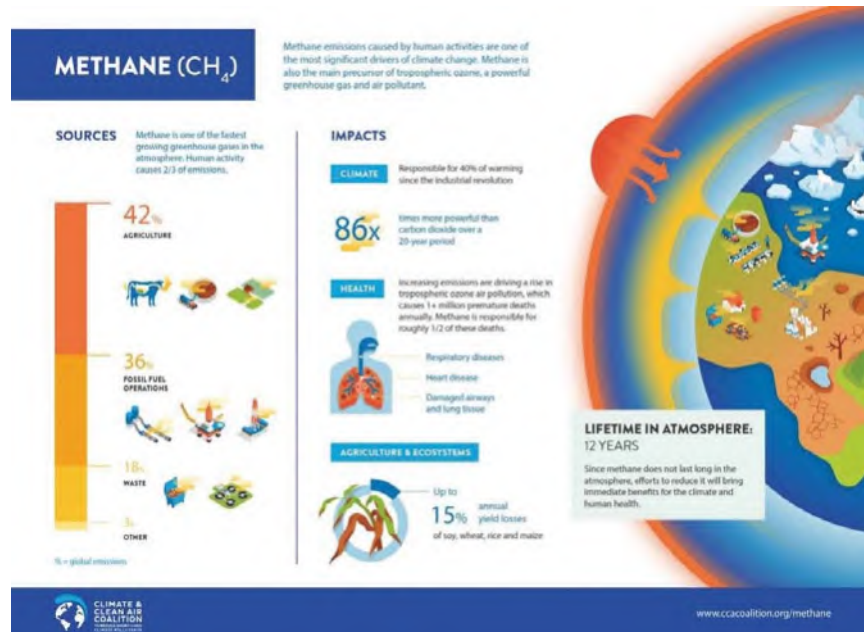
Since the creation of the forum in 2004, India is one of the members and recently it has taken up Vice-Chairmanship for the first time in the Steering Leadership along with the USA of GMI. The Chairperson of the Steering Leadership is from Canada.

This forum is a voluntary Government and an informal international partnership having members from 45 countries including the United States and Canada. But the forum has a partnership among developed and developing countries having economies in transition but not with underdeveloped countries. **So, Statement 2 is correct and Statement 3 is not correct.**

ADDITIONAL INFORMATION:

METHANE

- Facts**
- Methane is a powerful greenhouse gas emitted by human activities such as leakage from natural gas systems and the raising of livestock, as well as by natural sources such as wetlands.
 - It has a direct influence on climate, but also a number of indirect effects on human health, crop yields, and the quality and productivity of vegetation through its role as an important precursor to the formation of tropospheric ozone.
 - Methane warms the planet 86 times as much as carbon dioxide over 20 years.
 - Methane remains in the atmosphere for about 12 years.
 - Globally, over 60% of total methane emissions come from human activities.
 - Agriculture is the key emitting sector of methane emissions, responsible for about 40%.



Q.3) Consider the following statements :

1. The National Clean Air Programme, administered by the Central Pollution Control Board, is a nationwide program to keep track of ambient air quality.
2. Particulate Matter containing sulphur or nitrogen compounds has a warming effect on the local and global climate.

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**

EXPLANATION:

Central Pollution Control Board is executing a nationwide programme of ambient air quality monitoring known as the National Air Quality Monitoring Programme (NAMP) but not the National Clean Air Programme.

The National Clean Air Programme (NCAP) was launched in 2019, by the Ministry of Environment, Forest and Climate Change with targets to achieve a 20 to 30 % reduction in PM10 and PM2.5 concentrations by 2024.

Under NCAP, 131 cities are being targeted for improving air quality. Of these 131 cities, 123 cities (NACs) are identified under NCAP based on non-conforming to national ambient air quality standards (NAAQS) consecutively for five years. In addition, million plus cities (MPCs) are also covered, those identified by 15th Finance Commission (XV-FC), for receiving performance based grant for air quality improvement.

Out of 42 MPCs, 34 cities are common under NCAP. Thus 131 cities (NACs and MPCs) are being monitored under the NCAP for improving air quality.

Recently, its target got updated as the Centre aims at a 40% reduction in particulate matter concentration in 131 cities by 2026. **So, Statement 1 is not correct.**

Particulate matter is a complex pollutant. Depending upon its composition, it may have a cooling or warming effect on the local and global climate. For example, black carbon, one of the constituents of fine PM and a result of incomplete burning of fuels, absorbs solar and infrared radiation in the atmosphere and thus has a warming effect.

Other types of PM containing sulphur or nitrogen compounds have the opposite effect. They tend to act as small mirrors, reflecting the sun's energy and thus leading to cooling. In simple terms, it depends on the colour of the particle. 'White' particles tend to reflect sunlight, while 'black' and 'brown' particles absorb it.

Hence, Particulate Matter containing sulphur or nitrogen compounds gives a cooling effect on the local and the global climate rather than a warming effect. **So, Statement 2 is not correct.**

ADDITIONAL INFORMATION:

NATIONAL AIR QUALITY MONITORING PROGRAMME (NAMP)

- Objectives**
- To determine the status and trends of ambient air quality.
 - To ascertain whether the prescribed ambient air quality standards are violated, to Identify Non-attainment Cities.
 - To obtain the knowledge and understanding necessary for developing preventive and corrective measures.
 - To understand the natural cleansing process in the environment through pollution dilution, dispersion, wind-based movement, dry deposition, precipitation and chemical transformation of pollutants generated.

- Parameters** ➤ Under N.A.M.P., four air pollutants viz ., Sulphur Dioxide (SO₂), Oxides of Nitrogen as NO₂, Respirable Suspended Particulate Matter (RSPM / PM₁₀) and Fine Particulate Matter (PM_{2.5}) have been identified for regular monitoring at all the locations.
- The monitoring of meteorological parameters such as wind speed and wind direction, relative humidity (RH) and temperature were also integrated with the monitoring of air quality.

Q.4) With reference to Global Warming potential (GWP), consider the following statements :

1. The Global Warming Potential (GWP) was developed to compare the global warming impacts in different countries.
2. The GWP is a measure of the heat absorbed over a given time period relative to CO₂ due to emissions of gases.
3. The GTP (Global Temperature Potential) is a measure of the temperature change at the end of that time period relative to methane.
4. Methane takes more time to break down in the atmosphere than carbon dioxide.

Which of the statements given above is/are correct ?

- (a) 1 and 4 only
- (b) **2 only**
- (c) 2 and 3 only
- (d) 2, 3 and 4 only

EXPLANATION:

Global Warming Potential (GWP) has been developed as a metric to compare (relative to another gas) the ability of each greenhouse gas to trap heat in the atmosphere. Carbon dioxide (CO₂) was chosen as the reference gas to be consistent with the guidelines of the Intergovernmental Panel on Climate Change (IPCC). Thus, it was not developed to compare the global warming impacts in different countries but to compare the global warming impacts of different gases. **So, Statement 1 is not correct.**

Each gas has a specific global warming potential (GWP), which allows comparisons of the amount of energy the emissions of 1 ton of a gas will absorb over a given time period, usually a 100-year averaging time, compared with the emissions of 1 ton of CO₂.

So, Statement 2 is correct.

Unlike the GWP, which measures the heat absorbed over a given time period due to gas emissions, the Global Temperature Potential (GTP) measures the temperature change at the end of that time period relative to CO₂ but not to Methane.

The calculation of the GTP is more complicated than that for the GWP, based on models of the response of the climate system to increased greenhouse gas concentrations, that is, climate sensitivity and the amount of time it takes the system to respond, especially on the ocean's capacity to absorb the heat. **So, Statement 3 is not correct.**

Carbon dioxide remains in the atmosphere for hundreds to thousands of years. This means that even if emissions were immediately and dramatically reduced, they would not affect the climate until later in the century. But it takes only about a decade for Methane to break down.

So, reducing methane emissions now would have an impact in the near term and is critical for helping keep the world on a path to 1.5°C. Thus, Methane takes only less time to break down in the atmosphere than carbon dioxide. **So, Statement 4 is not correct.**

ADDITIONAL INFORMATION:

METHANE

Source ➤ Agriculture is the predominant source.

- Livestock emissions – from manure and gastroenteric releases – account for roughly 32 percent of human-caused methane emissions.
- Population growth, economic development, and urban migration have stimulated unprecedented demand for animal protein and with the global population approaching 10 billion, this hunger is expected to increase by up to 70% by 2050
- Agricultural methane doesn't only come from animals, though.
- Paddy rice cultivation – in which flooded fields prevent oxygen from penetrating the soil, creating ideal conditions for methane-emitting bacteria – accounts for another 8 percent of human-linked emissions.

Facts

- Methane is the primary contributor to the formation of ground-level ozone, a hazardous air pollutant, and greenhouse gas, exposure to which causes 1M premature deaths every year.
- Methane is also a powerful greenhouse gas. Over 20 years, it is 80 times more potent at warming than carbon dioxide.
- Methane has accounted for roughly 30 percent of global warming since pre-industrial times and is proliferating faster than at any other time since record-keeping began in the 1980s.
- In fact, according to recent data, even as carbon dioxide emissions decelerated during the pandemic-related lockdowns of 2020, atmospheric methane shot up.

Q.5) “POP FAME” recently seen in the media is related to which one of the following ?

- (a) **Rocket fuel from bacteria**
- (b) Music festival of Nagaland
- (c) Space science award given by JAXA
- (d) Indigenously developed medicine treat Conjunctivitis caused by Bacteria

EXPLANATION:

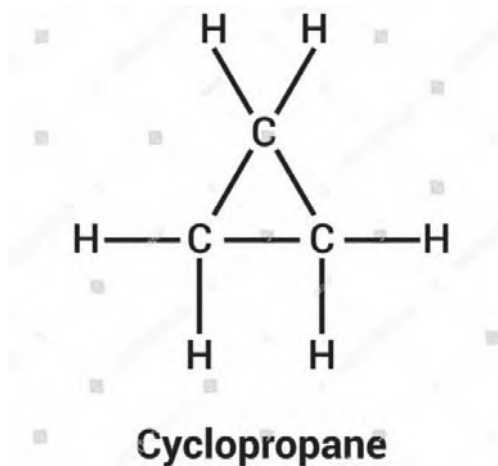
POP FAME is a fuel from a bacterium that packs more energy than even the rocket fuels in use today. It is a polycyclopropanated fatty acid methyl ester. It was found that POP-FAME carries more energy than petrol or some conventional rocket fuels. The fuel has energy density values exceeding 50 megajoules a liter, compared with 32 MJ for petrol and 35 MJ for RP-1, a kerosene-based rocket fuel. **So, Option (a) is correct**

ADDITIONAL INFORMATION:

POP FAME

About

- Around the 1960s, The Soviet Union developed a petroleum-based rocket fuel called Syntin and it is used to launch several Soyuz rockets in the 1970s successfully.
- Syntin is **a hydrocarbon used as a rocket fuel with the molecular formula C₁₀H₁₆**.
- Even though its performance is powerful, its manufacturing was halted due to its high costs and some unpleasant processes were involved.
- POP-FAME's molecular structure closely resembles Syntin's. At the heart of the fuel's structure is the 'three-carbon' ring(Each carbon atom combines with two other carbon atoms and two other elements, mostly hydrogen.). This structure is called as cyclopropane.
- POP-FAME has higher energy densities than Syntin, which means even a small quantity of the fuel can pack some considerable energy, for an ideal rocket fuel.

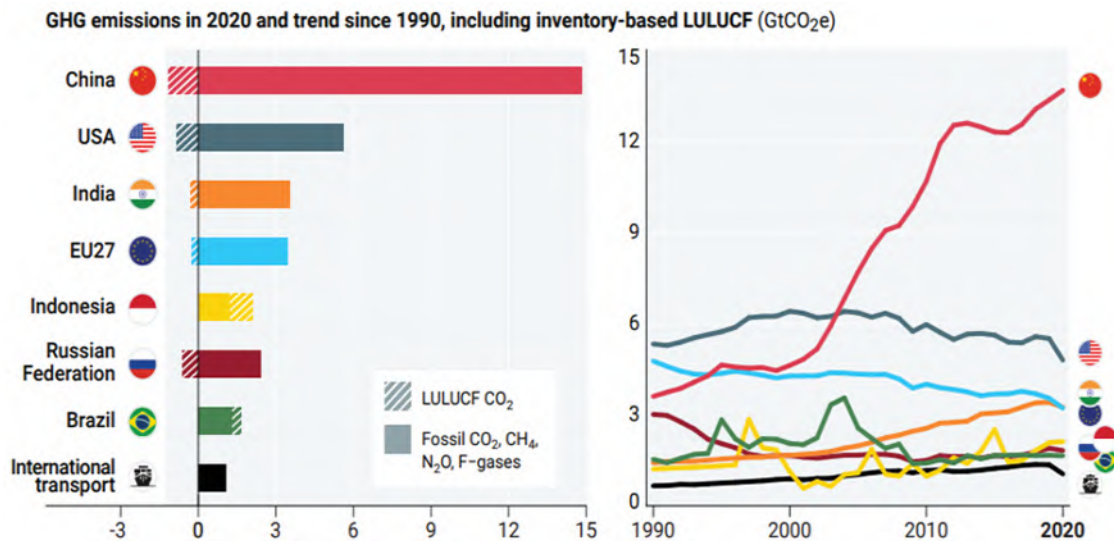


Q.6) Which one of the following is the correct sequence in the decreasing order of contribution of global greenhouse gas emissions ?

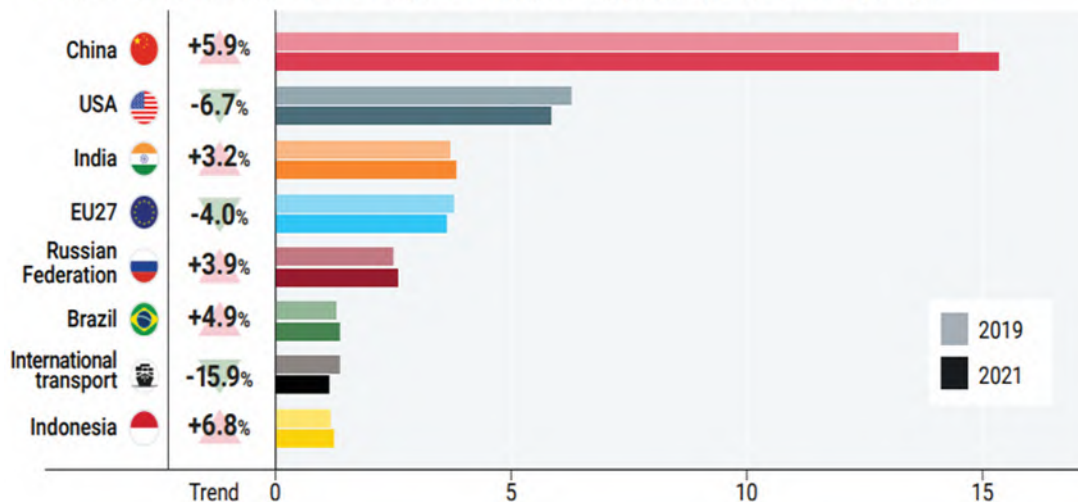
- (a) **China-United States-India-European Union**
- (b) United States-China-India-European Union
- (c) European Union -United States-China-India
- (d) European Union-United States- India-China

EXPLANATION:

According to the Emissions Gap Report 2022 of the United Nations Environment Programme, the following is the decreasing order of global nations' contribution with respect to Green House Gas emissions. It is China, the United States of America, India, European Union. **So, Option (a) is correct.**



Estimate of GHG emissions in 2021 compared to 2019, excluding inventory-based LULUCF (GtCO₂e)



ADDITIONAL INFORMATION:

GREENHOUSE GAS EMISSION

About

- Greenhouse gases (also known as GHGs) are gases in the earth's atmosphere that trap heat.
- During the day, the Sun shines through the atmosphere, warming the earth's surface.
- At night, the earth's surface cools, releasing heat back into the air. But some of the heat is trapped by the greenhouse gases in the atmosphere.
- A greenhouse gas is called that because it absorbs infrared radiation from the Sun in the form of heat, which is circulated in the atmosphere and eventually lost to space.
- The main gases responsible for the greenhouse effect include carbon dioxide, methane, nitrous oxide, water vapor (which all occur naturally), and fluorinated gases (which are synthetic).

UNEP

- The United Nations Environment Programme (UNEP) is the leading environmental authority in the United Nations system.
- UNEP uses its expertise to strengthen environmental standards and practices while helping implement environmental obligations at the country, regional and global levels.
- United Nations Environment Programme (UNEP) released Emission Gap Report, whereby the report highlights the global greenhouse gas emissions trends.

Emission Gap

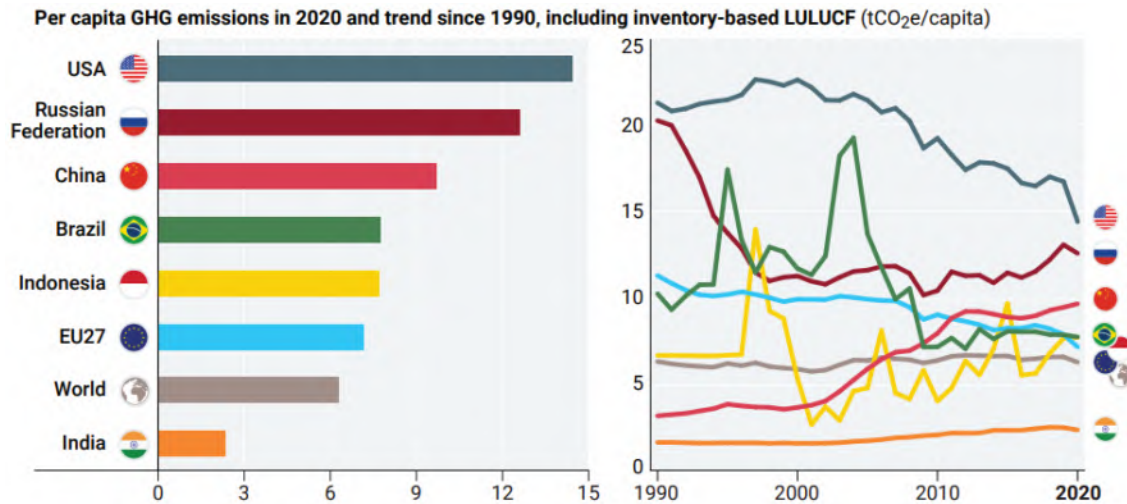
- It is the difference between the estimated total global greenhouse gas (GHG) emissions resulting from the full implementation of the nationally determined contributions (NDC) and the total global GHG emissions from least-cost pathways consistent with the Paris Agreement's long-term goal of limiting global average temperature increase to well below 2°C and pursuing efforts to limit it to 1.5°C relative to pre-industrial levels.

Top GHG emitters

- The top seven emitters (China, the United States of America, India, the EU27, Indonesia, Brazil, and the Russian Federation) plus international transport accounted for 55 percent of global GHG emissions in 2020.
- Collectively, G20 members are responsible for 75 percent of global GHG emissions.

Per capita emissions

- The Per capita emissions vary greatly across countries, whereby the world average per capita GHG emissions were 6.3 tons of CO₂ equivalent in 2020.
 - The U.S.A. tops the list, followed by Russia and China. India remains far below the world average



Q.7) With reference to Carbon sequestration, consider the following statements :

1. The London Convention and London Protocol are international regulatory instruments in carbon capture and sequestration in marine environment.
2. Indian Council of Forestry Research and Education established the National Centre of Excellence in Carbon Capture and Utilisation at IIT-Bombay.
3. CCUS (Carbon Capture Utilisation and Storage) are helpful in enhancing oil and gas recovery.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 only
- (c) **1 and 3 only**
- (d) 3 only

EXPLANATION:

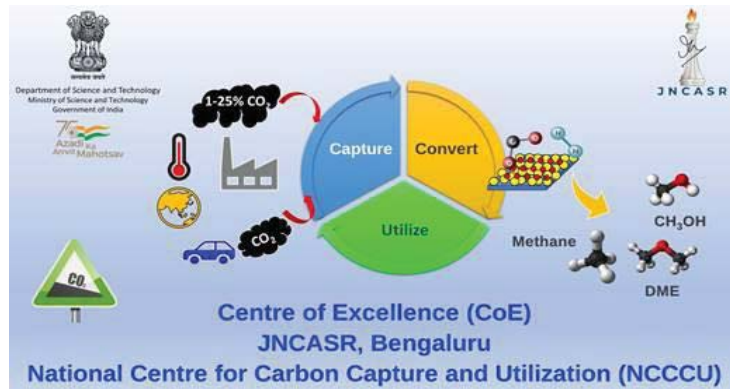
Carbon dioxide is the most commonly produced greenhouse gas. Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere to reduce global climate change.

The Contracting Parties to the London Convention (LC) and London Protocol (LP) have taken groundbreaking steps to mitigate the impacts of increasing concentrations of carbon dioxide (CO₂) in the atmosphere and to ensure that new technologies with the potential to cause harm to the marine environment are effectively controlled and regulated.

The LC and LP have been the most advanced international regulatory instruments addressing carbon capture and sequestration in sub-sea geological formations (CCS-SSGF) and marine geoengineering, such as ocean fertilization (OF). **So, Statement 1 is correct.**

Recently, two National Centres of Excellence in Carbon Capture and Utilization are being established in India. The two Centres, namely the National Centre of Excellence in Carbon Capture and Utilization (NCoE-CCU) at the Indian Institute of Technology (IIT) Bombay, Mumbai and the National Centre in Carbon Capture and Utilization (NCCCU) at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru.

But these are being set up with support from the Department of Science & Technology, under the Ministry of Science and Technology and hence, it was not established by the Indian Council of Forestry Research and Education. **So, Statement 2 is not correct.**



Carbon Capture, Utilization, and Storage (CCUS) encompass methods and technologies to remove CO₂ from the flue gas and from the atmosphere, followed by recycling the CO₂ for utilization and determining safe and permanent storage options.

Carbon dioxide emissions from power plants and stationary industrial sources account for more than 60 per cent of global greenhouse gas emissions. However, this CO₂ can be captured and stored, and, if injected into depleting oil reservoirs, can increase recovery through an “enhanced oil recovery” (EOR) process. Thus, CO₂ capture and storage and EOR present opportunities for the oil industry to participate in activities that will substantially reduce emissions, and, in the case of EOR, increase the recovery from oil fields.

Likewise, due to the method of carbon capture, utilization and storage (CCUS), CO₂ storage with enhanced gas recovery (CSEGR) can reduce CO₂ emission by sequestering it into gas reservoirs and simultaneously enhance natural gas production.

So, Statement 3 is correct.

ADDITIONAL INFORMATION:

INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION (ICFRE)

- About**
- In 1986 the Indian Council of Forestry Research and Education or ICFRE was formed as an umbrella organisation for taking care of forestry research, education and extension needs of the country.
 - Finally, on 1st June 1991, the ICFRE declared an autonomous Council under the then Ministry of Environment and Forests and registered as a Society under the Societies Registration Act, of 1860.
 - Presently, ICFRE with its Headquarters at Dehradun is an apex body in the national forestry research system that promotes and undertakes need-based forestry research extension
 - **It aims to** achieve long-term ecological stability, sustainable development and economic security through the conservation and scientific management of forest ecosystems.
 - To generate, advance and disseminate scientific knowledge and technologies for ecological security, improved productivity, livelihood enhancement and sustainable use of forest resources through forestry research and education.

Q.8) Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions is launched by which one of the following ?

- (a) **Climate & Clean Air Coalition and UNEP**
- (b) United Nations Framework Convention on Climate Change.
- (c) Intergovernmental Panel on Climate Change and Blue Green Alliance
- (d) Clean Air Task Force.

EXPLANATION:

Global Methane Assessment, a report released by the Climate and Clean Air Coalition (CCAC) and the United Nations Environment Programme (UNEP), shows that human-caused methane emissions can be reduced by up to 45 percent this decade. The Climate and Clean Air Coalition is a voluntary partnership of governments, intergovernmental organizations, businesses, scientific institutions and civil society organizations committed to improving air quality and protecting the climate through actions to reduce short-lived climate pollutants. **So, Option (a) is correct.**

ADDITIONAL INFORMATION:**GLOBAL METHANE ASSESSMENT: BENEFITS AND COSTS OF MITIGATING METHANE EMISSIONS**

- | | |
|---|--|
| About | <ul style="list-style-type: none">➤ Global Methane Assessment highlights the critical role that cutting methane emissions from the fossil fuel industry plays in slowing the rate of global warming.➤ The assessment, for the first time, integrates the climate and air pollution costs and benefits from methane mitigation.➤ The report highlights that this decade, cutting human-caused methane by 45% would keep warming beneath a threshold agreed upon by world leaders.➤ Such reductions would avoid nearly 0.3°C of global warming by 2045 and would be consistent with keeping the Paris Climate Agreement’s goal to limit global temperature rise to 1.5°C within reach.➤ Methane is considered the key ingredient in the formation of ground-level ozone (smog), a powerful climate forcer and dangerous air pollutant |
| CCAC | <ul style="list-style-type: none">➤ Climate & Clean Air Coalition’s vision is to have an atmosphere that enables people and the planet to thrive – stabilizing the climate with warming limited to 1.5°C and drastically reducing air pollution.➤ Its 2030 strategy is to deliver significant reductions in Short-Lived Climate pollution (SLCP) over the next decade.➤ Short-lived climate pollutants are powerful climate forcers that remain in the atmosphere for a much shorter period of time than carbon dioxide (CO₂). Yet, their potential to warm the atmosphere can be many times greater.➤ Black carbon, Methane, Tropospheric ozone, and Hydrofluorocarbons are the most important SLCP contributing to the man-made global greenhouse effect after carbon dioxide, which is responsible for up to 45% of global warming. |
| UNFCCC | <ul style="list-style-type: none">➤ The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 with the ultimate aim of preventing dangerous human interference with the climate system.➤ The 1997 Kyoto Protocol and the 2015 Paris Agreement were built on this Convention. |
| Intergovernmental Panel on Climate Change (IPCC) | <ul style="list-style-type: none">➤ IPCC is a scientific group assembled by the United Nations to monitor and assess all global science related to climate change.➤ The IPCC prepares comprehensive Assessment Reports about the state of scientific, technical and socio-economic knowledge on climate change, its impacts and future risks, and options for reducing the rate at which climate change is taking place.➤ It also produces Special Reports on topics agreed to by its member governments, as well as Methodology Reports that provide guidelines for the preparation of greenhouse gas inventories. |

Blue Green Alliance

- The BlueGreen Alliance is a project of America's national labor unions and major environmentalist groups designed to show a united front for progressive environmentalist policies.
- Its purpose is to unite labor unions and environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a clean, thriving, and equitable economy.

Clean Air Task Force

- Clean Air Task Force (CATF) is an NGO that works to reduce air pollution and push the change in technologies and policies needed to achieve a zero-emissions, high-energy planet at an affordable cost.
- Experts of CATF develop and advocate for policies that reduce and regulate emissions that are harmful to people and the planet.
- These policies allow governments to support research, development, and large-scale deployment of zero-carbon energy through tax incentives or direct subsidies for early projects.

Q.9) With reference to Climate Impacts on Agriculture and Food Supply, consider the following statements :

1. Premature budding in cherries.
2. Reduction in fertility and milk production in animals.
3. Increase in productivity of pastures with a decrease in their quality.
4. Increase in C4 plant's competition against C3 crops.
5. Climate change may increase the amount of arable land.

Which of the statements given above is/are **not** correct?

- (a) 1,2,3 and 4 only
- (b) 1,2,3 and 5 only
- (c) All of the above
- (d) **None of the above**

EXPLANATION:

Climate change could make it more difficult to grow crops, raise animals, and catch fish in the same ways and same places as we have done in the past. The effects of climate change also need to be considered along with other evolving factors that affect agricultural production, such as changes in farming practices and technology.

More extreme temperatures and precipitation can prevent crops from growing. Extreme events, especially floods and droughts, can harm crops and reduce yields. For instance, in 2010 and 2012, high nighttime temperatures affected corn yields across the U.S. Corn Belt, and premature budding due to a warm winter caused \$220 million in losses for Michigan cherries in 2012. **So, Statement 1 is correct.**

Climate change could affect animals both directly and indirectly. For example, Drought may threaten pasture and feed supplies, and heat stress can increase livestock vulnerability to disease, reduce fertility, and reduce milk production. **So, Statement 2 is correct.**

Increases in carbon dioxide (CO₂) may increase the productivity of pastures but may also decrease their quality. Increases in atmospheric CO₂ can increase the productivity of plants on which livestock feed. However, the quality of some of the forage found in pasturelands decreases with higher CO₂. As a result, cattle need to eat more to get the same nutritional benefits. **So, Statement 3 is correct.**

C3 plants are defined as a plant that does not consist of any photosynthetic adaptations to reduce photorespiration. Photorespiration refers to a process in plant metabolism where the enzyme RuBisCO oxygenates RuBP, wasting some of the energy produced by photosynthesis. The Photorespiration rate in

C3 plants is very high, and hence these plants are less efficient in photosynthesis. On the other hand, C4 plants are more efficient in photosynthesis because photorespiration is absent in these plants. Also, the optimum temperature for photosynthesis in C3 plants is very low, while in C4 plants, it is high. These are some factors that increase the C4 plant's competitiveness against C3 plants. Some examples of C3 plants include rice, wheat, soybeans and all trees. Examples of C4 plants include Maize, Sugarcane, Amaranthus etc. **So, Statement 4 is correct.**

As per recent research, climate change could expand the agricultural feasibility of the global boreal region that is, it may increase the area under the arable land by 44 percent by the end of the century.

However, the scientists warn that the same climate trends that would increase land suitable for crop growth in that area could also significantly change the global climatic water balance which is negatively impacting agriculture in the rest of the world. **So, Statement 5 is correct.**

Q.10) Consider the following statements :

1. The Climate and Clean Air Coalition (CCAC) is a voluntary partnership of governments and civil society organizations to reduce short-lived climate pollutants.
2. CCAC focuses on carbon dioxide, methane, chlorofluorocarbons, and tropospheric ozone.
3. CCAC's vision is to stabilize the climate with warming limited to 1.5°C and drastically reduce air pollution.

Which of the statements given above is/are correct ?

- (a) 1 only
- (b) **1 and 3 only**
- (c) 2 and 3 only
- (d) 1,2 and 3

EXPLANATION:

The Climate and Clean Air Coalition (CCAC) is a voluntary partnership of governments, intergovernmental organizations, businesses, scientific institutions, and civil society organizations committed to protecting the climate and improving air quality through actions to reduce short-lived climate pollutants.

The Coalition brings hundreds of experienced and influential stakeholders worldwide to leverage high-level engagement and catalyze concrete actions in both the public and private sectors. This coalition operation is supported by a secretariat that sits within UN Environment in Paris, France. **So, Statement 1 is correct.**

Short-lived climate pollutants are powerful climate forcers that remain in the atmosphere for a much shorter period of time than carbon dioxide (CO₂), yet their potential to warm the atmosphere can be many times greater. Certain short-lived climate pollutants are also dangerous air pollutants that have harmful effects on people, ecosystems, and agricultural productivity.

CCAC focuses on the short-lived climate pollutants black carbon, methane, tropospheric ozone, and hydrofluorocarbons which are the most important contributors to the man-made global greenhouse effect after carbon dioxide, responsible for up to 45% of current global warming which is associated with refrigeration, diesel-fueled vehicles, and solid-fuel cooking fires.

But the chlorofluorocarbons are not covered under this coalition and also Carbondioxide is not covered as it is a long-lived pollutant. **So, Statement 2 is not correct.**

This coalition aims for global efforts to decarbonize the economy, limit global temperature rise to 1.5°C to stabilise the climate, reduce air pollution drastically, and achieve the related Sustainable Development Goals.

Methane emissions can be reduced by 40% and black carbon by 70% by 2030 (from 2010 levels).**So,**

Statement 3 is correct.

ADDITIONAL INFORMATION:

SHORT-LIVED CLIMATE POLLUTANTS

- Methane** ➤ Methane is emitted by human activities such as leakage from natural gas systems and livestock production, as well as by natural sources such as wetlands.
➤ It is a powerful greenhouse gas whose potential to warm the atmosphere is many times stronger than that of the same given mass of carbon dioxide.
- Hydro Fluorocarbons** ➤ Hydrofluorocarbons are man-made greenhouse gases used in air conditioning, refrigeration, solvents, fire extinguishing systems, and aerosols.
➤ Though HFCs represent a small fraction of current greenhouse gas emissions, their potential to warm the atmosphere is hundreds to thousands of times greater than that of the same given mass of carbon dioxide.
- Tropospheric Ozone** ➤ Tropospheric ozone is a major air pollutant and greenhouse gas formed by the interaction of sunlight with hydrocarbons and nitrogen oxides, which are emitted by vehicles, fossil fuel power plants, refineries, and other industries.
➤ It is especially harmful to vegetation and human health.
- Black Carbon** ➤ Black carbon, a climate forcer, and air pollutant is a product of the incomplete combustion of fossil fuels, biofuels, and biomass.
➤ A component of particulate matter, black carbon, also referred to as soot, is emitted into the atmosphere along with a complex mixture of air pollutants.

Q.11) Consider the following :

1. Adriatic Sea
2. Aegean Sea
3. Bosphorus strait
4. Black Sea
5. Sea of Marmara
6. Kerch Strait
7. Tyrrhenian Sea

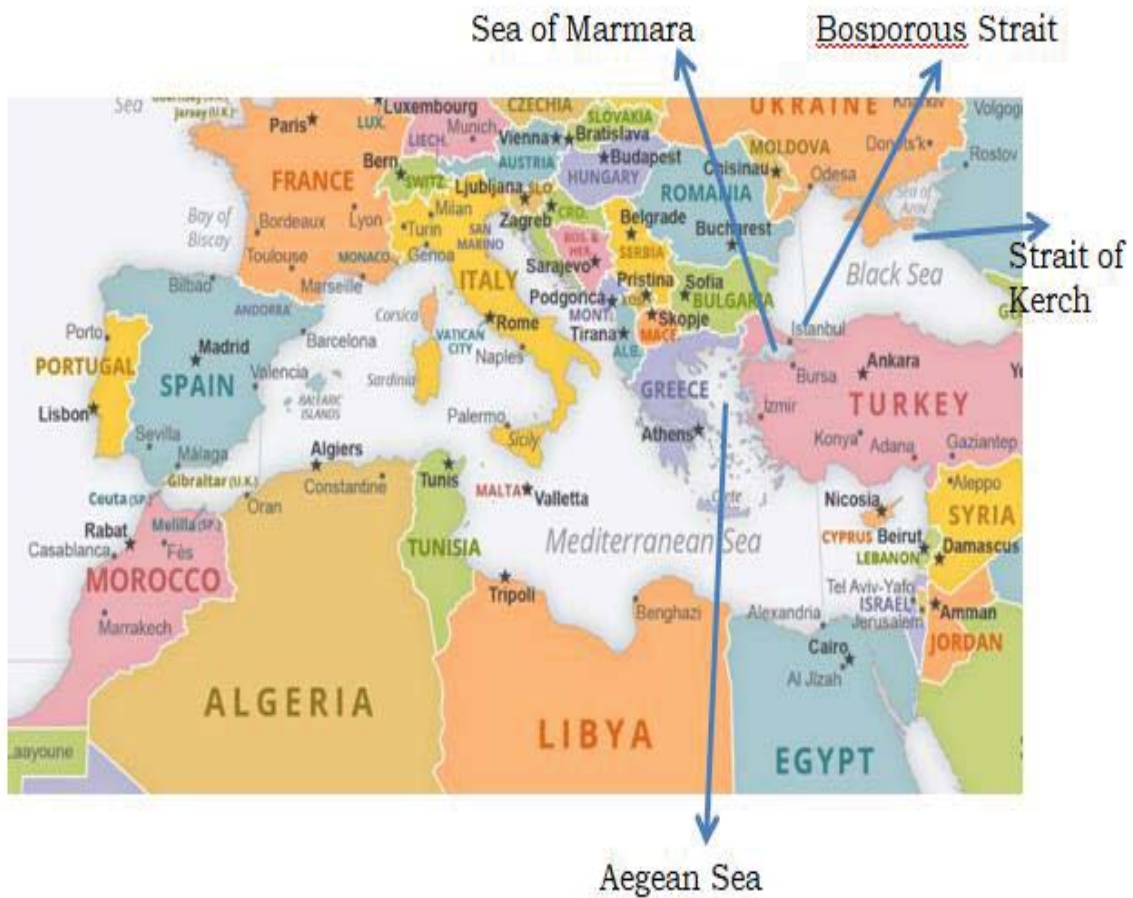
Select the correct shortest sequence to travel from the Mediterranean Sea to the Sea of Azov using the code given below :

- (a) 1-3-4-5-7
- (b) **2-5-3-4-6**
- (c) 1-2-3-5-7
- (d) 2-3-4-5-6

EXPLANATION:

The Shortest sequence to travel from the Mediterranean Sea to the Sea of Azov is

Aegean Sea – Sea of Marmara – Bosphorous Strait – Black Sea – Kerch Strait. **So, Option (b) is correct.**



shortest sequence to travel from Mediterranean Sea to Sea of Azov

ADDITIONAL INFORMATION:

SEAS AND BORDERING COUNTRIES

- Adriatic Sea** Bordering countries
- Croatia
 - Italy
 - Albania
 - Montenegro
 - Slovenia
 - Bosnia and Herzegovina



- Aegean Sea** Bordering countries
- Greece
 - Turkey



- Tyrrhenian Sea** Bordering countries
- Italy
 - France



Q.12) Consider the following statements :

1. Climate-smart agriculture (CSA) is an integrated approach to manage landscapes, cropland, livestock, forests and fisheries.
2. In India, the Climate Smart Village approach is led by FAO.

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

EXPLANATION:

Climate-smart agriculture (CSA) is an integrative approach to address the interlinked challenges of food security and climate change. It guides the actions to transform Agri-food systems towards green and climate-resilient practices. It supports in reaching internationally agreed goals such as SDGs and Paris Agreement.

It aims to tackle three main objectives:

- Sustainably increasing agricultural productivity to support equitable increases in farm incomes, food security and development;
- Adapting and building the resilience of agricultural and food security systems to climate change at multiple levels;
- Reducing greenhouse gas emissions from agriculture (including crops, livestock and fisheries).

Thus, Crop production, Livestock and aquaculture management, capture fisheries, and agroforestry are integrated in this approach. **So, Statement 1 is correct.**

- Climate smart village approach in India is a part of project led by the climate change, Agriculture and Food Security (CCAFS), an international research programme. CCAFS Climate-Smart Villages (CSVs) have successfully combined global knowledge with local action to help farmers sustainably produce more food, while curbing greenhouse gas emissions and increasing resilience to climate change.
- CCAFS seeks to address the increasing challenge of global warming and declining food security on agricultural practices, policies and measures through strategic, broad-based global Partnerships.
- Thus, Climate Smart Village is led by climate change, Agriculture and Food Security (CCAFS), not FAO.

So, Statement 2 is not correct

ADDITIONAL INFORMATION:

CLIMATE SMART AGRICULTURE

Recently in News	Recently Bihar adopted climate-smart agricultural practices. Bihar is highly vulnerable to hydrometeorological natural disasters as it has both flood-prone and drought-prone areas.
About	FAO coined the term Climate Smart Agriculture in back of 2010 Hague Conference on Food Security, Agriculture and Climate change. It was developed with a strong focus on food security, including adaptation to climate change.
Key Elements of CSA	<ul style="list-style-type: none"> ➤ Management of farms, crops, livestock, aquaculture and capture fisheries to manage resources better. ➤ Ecosystem and landscape management to conserve ecosystem services are key to increasing resource efficiency. ➤ Services for farmers and land managers to enable them to implement necessary changes.

PARIS AGREEMENT

Recently in News	India's updated climate pledge to the Paris Agreement received the Union Cabinet's nod August 3, 2022. The pledge will lay out India's clean energy transition pathway from now through 2030 and will be communicated to the United Nations Framework Convention on Climate Change (UNFCCC).
About	<p>It is a legally binding international treaty on climate change. It was adopted by 200 parties at COP21 Paris 2015 agreed to reduce GHG emissions and entered into force on 2016.</p> <p>Its goal is to limit global warming to below 2, preferably to 1.5 degree Celsius compared to pre industrial levels</p>

Q.13) Consider the following statements :

1. "National solar mission" aims the development of large-scale and rooftop solar projects and trading of solar power.
2. Solar Energy Corporation of India (SECI) is a company under the Ministry of New and Renewable Energy to facilitate the implementation of the National Solar Mission (NSM).

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

EXPLANATION:

The objective of the National Solar Mission is to establish India as a global leader in solar energy by creating the policy conditions for its diffusion across the country as quickly as possible.

To create an enabling policy framework for the deployment of 20,000 MW of solar power by 2022. The

cumulative target has been revised to 1,00,000 MW by 2022. The target will principally comprise of 40 GW Rooftop and 60 GW through Large and Medium Scale Grid Connected Solar Power Projects.

So, Statement 1 is not correct.

Solar Energy Corporation of India (SECI) is a Central Public Sector Undertaking (CPSU) under the administrative control of the Ministry of New and Renewable Energy (MNRE), set up on 20th September 2011 to facilitate the implementation of the National Solar Mission (NSM) and achievement of targets set therein. It is the only CPSU dedicated to the renewable energy sector. **So, Statement 2 is correct.**

ADDITIONAL INFORMATION:

NATIONAL SOLAR MISSION

- About**
- The National Solar Mission (NSM) was launched on 11th January 2010.
 - It is a major initiative of the Government of India and State Governments to promote ecologically sustainable growth while addressing India's energy security challenge.
 - It will also constitute a major contribution by India to the global effort to meet the challenges of climate change.
 - The Mission will adopt a 3 - phase approach,
 - Phase 1 (2012 - 13)
 - Phase 2 (2013 - 17)
 - Phase 3 (2017 - 22)
 - National Solar Mission envisages the installation of around 10 GW of utility-scale solar power projects in Phase II.
 - It is envisaged that out of this 10 GW target, 4 GW would be developed under the central scheme and 6 GW under various State specific schemes.
 - The Mission is aimed at reducing the cost of solar power generation in the country through
 - Long-term policy
 - Large-scale deployment goals
 - Aggressive Research & Development
 - Domestic production of critical raw materials, components and products, as a result, to achieve grid tariff parity by 2022.
 - Mission will create an enabling policy framework to achieve this objective and make India a global leader in solar energy.
- Solar Energy Corporation of India**
- Its vision is to build a 'Green India' by harnessing abundant solar radiation and achieving energy security for the country.
 - Its Mission is
 - To become the leader in the development of large-scale solar installations, solar plants and solar parks and to promote and commercialize the use of solar energy to reach the remotest corner of India.
 - To become the leader in exploring new technologies and their deployment to harness solar energy.
 - The company is responsible for the implementation of a number of government schemes, major ones being the Viability Gap Funding(VGF) schemes for large-scale grid-connected projects under Jawaharlal Nehru National Solar Mission(JNNSM), solar park scheme and grid-connected solar rooftop scheme etc.

Q.14) Consider the following statements :

1. Market Transformation for Energy Efficiency (MTEE) scheme aims at improving efficiency in energy-intensive sectors.
2. PAT(Perform Achieve and Trade) scheme is a flagship program of the Bureau of Energy Efficiency.
3. PAT scheme helps in the shift towards energy-efficient appliances.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) **2 only**
- (c) 2 and 3 only
- (d) 1, 2 and 3 only

EXPLANATION:

Market Transformation for Energy Efficiency (MTEE) scheme is one of the four initiatives of the National Mission for Enhanced Energy Efficiency that aims to accelerate the shift to energy-efficient appliances in designated sectors through innovative measures to make the products more affordable. **So, Statement 1 is not correct.**

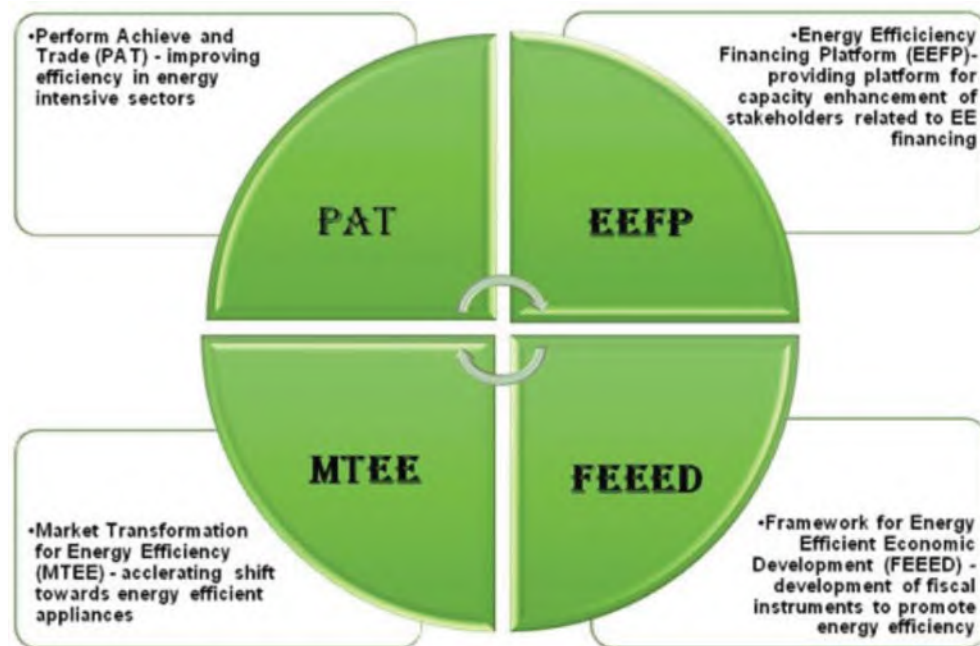
Perform, Achieve and Trade (PAT) is the flagship program under the mission implemented by the Bureau of Energy Efficiency (BEE) under the aegis of the Ministry of Power. **So, Statement 2 is correct.**

PAT scheme is a regulatory instrument to reduce specific energy consumption in energy-intensive industries, with an associated market-based mechanism to enhance cost effectiveness through certification of excess energy saving, which can be traded. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

NATIONAL MISSION FOR ENHANCED ENERGY EFFICIENCY

- About**
- The National Mission for Enhanced Energy Efficiency (NMEEE) is one of the eight missions under the National Action Plan on Climate Change (NAPCC).
 - NMEEE aims to strengthen the market for energy efficiency by creating a conducive regulatory and policy regime and has envisaged fostering innovative and sustainable business models for the energy efficiency sector.
 - The NMEEE spelled out four initiatives to enhance energy efficiency in energy-intensive industries which are as follows:
 - Perform Achieve and Trade Scheme (PAT)
 - Market Transformation for Energy Efficiency (MTEE)
 - Energy Efficiency Financing Platform (EEFP)
 - Framework for Energy Efficient Economic Development (FEEED)



Q.15) Consider the following statements with reference to SWAMIH Investment Fund :

1. It is a social impact fund aimed at providing priority debt financing for the completion of stressed and brownfield residential projects.
 2. The fund is sponsored and managed by SBICAP Ventures, a unit of the State Bank 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

EXPLANATION:

SWAMIH Investment Fund I, India's largest social impact fund, has been formed to complete the construction of stalled, brownfield, RERA-registered residential developments in the affordable housing / mid-income category that are networth positive and require last-mile funding to complete the construction.

So, Statement 1 is Correct.

The Sponsor of the Fund is the Secretary, Department of Economic Affairs, Ministry of Finance, Government of India on behalf of the Government of India.

The Investment Manager of the Fund is SBICAP Ventures Ltd., an asset management company that is a wholly-owned subsidiary of SBI Capital Markets Ltd, which in turn is a wholly-owned subsidiary of the State Bank of India. **So, Statement 2 is not Correct.**

ADDITIONAL INFORMATION:

SWAMIH INVESTMENT FUND

- | | |
|--------------------------|---|
| Recently in News | Recently, the Indian government has invested over Rs 5,000 Cr more in SWAMIH Investment Fund I to help homebuyers |
| About SWAMIH fund | ➤ SWAMIH Investment Fund is a government-backed fund set as a Category-II AIF (Alternate Investment Fund) debt fund registered With SEBI. |

Aim	Provide funds to stalled projects, including those declared as Non Performing Assets pending proceedings before National Company Law Tribunal (NCLT) under the Insolvency and Bankruptcy Code.
Benefits	<ul style="list-style-type: none"> ➤ A large amount of capital will be released once construction is finished. ➤ It will provide employment to Construction Workers. ➤ It will improve the economic status of the Nation. ➤ It will also improve the portfolios of banks and NBFCs.
Who Can Invest	<ul style="list-style-type: none"> ➤ 50% of the fund in the Government holding. ➤ Life Insurance Corporation and State bank of India each of 10%. ➤ Others rest with Public and Private players, which will include cash-rich financial institutions, public and private banks, sovereign wealth funds, domestic pension and provident funds, global pension funds and other institutional investors.
Alternate Investment Fund	<ul style="list-style-type: none"> ➤ In India, alternative investment funds (AIFs) are defined in Regulation 2(1) (b) of the Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012. It refers to any privately pooled investment fund (whether from Indian or foreign sources) in the form of a trust, a company, a corporate body, or a Limited Liability Partnership (LLP). Hence, in India, AIFs are private funds that are otherwise not coming under the jurisdiction of any regulatory agency in India. ➤ An alternative investment is a financial asset that does not fit into the conventional equity/income/cash categories. ➤ Private equity or venture capital, hedge funds, real property, commodities, and tangible assets are all examples of alternative investments.
Categories of Alternative Investment Funds (AIFs)	<p>As per Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012, Alternative Investment Funds shall seek registration in one of the three categories</p> <ul style="list-style-type: none"> ➤ Category I: Mainly invests in start-ups, SMEs or any other sector that Govt. considers economically and socially viable. ➤ Category II: These include Alternative Investment Funds such as private equity funds or debt funds for which no specific incentives or concessions are given by the government or any other Regulator ➤ Category III: Alternative Investment Funds such as hedge funds or funds that trade to make short-term returns or such other funds that are open-ended and for which the government or any other Regulator gives no specific incentives or concessions.

Q.16) Consider the following statements :

1. India's National Mission on Sustainable Habitat seeks to promote energy efficiency in buildings through the energy conservation building code.
2. The New Urban Agenda was adopted at the United Nations Framework convention on climate change for sustainable urban development.

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

EXPLANATION:

The National Mission on Sustainable Habitat seeks to promote Improvements in energy efficiency in buildings through the extension of the energy conservation building code, which addresses the design of new and large commercial buildings to optimize their energy demand. **So, Statement 1 is correct.**

The New Urban Agenda was formally adopted by national governments at the United Nations Conference on Housing and Sustainable Urban Development, commonly referred to as Habitat III, on 20 October 2016, in the city of Quito, Ecuador. The agreement provides the road map for sustainable urban development in our cities over the next 20 years. **So, Statement 2 is not correct.**

ADDITIONAL INFORMATION:**NATIONAL ACTION PLAN FOR CLIMATE CHANGE (NAPCC)**

- About**
- National Action Plan for Climate Change (NAPCC), launched in 2008, outlines multi-pronged, long-term strategies to address climate change and its impacts.
 - There are eight National Missions under the National Action Plan, with the National Mission on Sustainable Habitat being one of them.
 - The National Mission on Sustainable Habitat seeks to promote:
 - Build energy efficiency is improved through the extension of the energy conservation building code, which addresses the design of new and large commercial buildings to optimize their energy demand.
 - Better urban planning and modal shift to public transport - make long-term transport plans to facilitate the growth of medium and small cities to ensure efficient and convenient public transport.
 - Improved management of solid and liquid waste, e.g., recycling of material and urban waste management – with a special focus on developing technology for producing power from waste.
 - Improved ability of habitats to adapt to climate change by improving the resilience of infrastructure, community-based disaster management, and measures for improving advance warning systems for extreme weather events.
 - Conservation through appropriate changes in the legal and regulatory framework.

- The New Urban Agenda**
- The New Urban Agenda highlights linkages between sustainable urbanization and job creation, livelihood opportunities and improved quality of life, and it insists on the incorporation of all these sectors in every urban development or renewal policy and strategy.
 - It is an action-oriented 24-page document that provides the global principles, policies and standards required to achieve sustainable urban development to transform the way we construct, manage, operate and live in our cities.
 - It will guide the efforts around urbanization for a wide range of actors, including nation-states, city and regional leaders, funders of international development, the private sector, the United Nations programs and civil society for the next 20 years.
 - The New Urban Agenda takes into account the synergies that exist with other global agreements, namely the Sustainable Development Goals (SDGs), the global climate agreement reached at COP21 in Paris, the Addis Ababa Action Agenda, Sendai Framework for Disaster Risk Reduction 2015-2030, the Vienna Programme of Action for Landlocked Developing Countries, SAMOA and the Istanbul Programme of Action for the Least Developed Countries to provide a holistic transformation approach for addressing urbanisation.

Q.17) The Global Climate Change Alliance Plus (GCCA+) is an initiative of which one of the following?

- (a) UNFCCC
- (b) **European Union**
- (c) World Meteorological Organisation
- (d) Intergovernmental Panel on Climate Change

EXPLANATION:

The Global Climate Change Alliance Plus (GCCA+) is a flagship European Union initiative helping the world's most vulnerable countries to address climate change.

- This EU initiative helps mainly Small Islands Developing States (SIDS) and Least Developed Countries (LDCs) increase their resilience to climate change.
- The EU GCCA+ also supports these countries in implementing their commitments resulting from the 2015 Paris Agreement on Climate Change (COP21), in line with the 2030 Agenda for Sustainable Development and the new European Consensus on Development.
- The EU GCCA+ initiative contributes significantly towards achieving the overall target of at least 20 % of the EU budget spent on climate action. All EU GCCA+ projects must aim to facilitate the transition to a climate-resilient, low-carbon future in line with the 2°C targets.

So, Option (b) is correct.

ADDITIONAL INFORMATION:

GLOBAL CLIMATE CHANGE ALLIANCE PLUS (GCCA+)

About	An EU-funded GCCA+ action will pursue "an objective of climate change adaptation (CCA) and climate change mitigation (CCM) and disaster risk reduction (DRR) to contribute to strengthened climate resilience."
Climate Change Adaptation (CCA)	A CCA intervention aims to reduce the vulnerability of human or natural systems to the current and expected impacts of climate change, including climate variability, by maintaining or increasing resilience through a greater ability to adapt to, or absorb, climate change stresses, shocks and variability and by helping reduce exposure to them.
Intervention	➤ The Sendai Framework for Risk Reduction (2015-2030) underlines the need to address climate change as a driver of disaster risk, calling for better adaptation of linking and risk reduction action.
Climate Change Mitigation (CCM)	A CCM intervention typically contributes to stabilizing greenhouse gas (GHG) concentrations in the atmosphere by promoting efforts to reduce or limit GHG emissions or enhance GHG sequestration.
Main Priorities	<ul style="list-style-type: none">➤ Mainstreaming climate change issues into poverty reduction and development efforts.➤ Increasing resilience to climate-related stresses and shocks.➤ Supporting the formulation and implementation of concrete and integrated sector-based climate change adaptation and mitigation strategies.

Q.18) With reference to UN-REDD and REDD+, consider the following statements :

1. UN-REDD is a multilateral collaborative program of the World Bank, UNDP and United Nations Environment Programme.
2. REDD+ is a voluntary climate change mitigation approach that has been developed by Parties to the UNFCCC.
3. Implementation of the REDD+ program will always strengthen the Rights of Forest Tribals and Other Traditional Dwellers
4. REDD+ helps achieve poverty reduction, health and well-being.

Which of the statements given above is/are correct?

(a) 2 and 4 only

(b) 2, 3 and 4 only

(c) 1,3 and 4 only

(d) 1, 2, 3 and 4

EXPLANATION:

The UN-REDD Programme is the United Nations' collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD+) in developing countries. The Programme was launched in 2008 and built on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP).

UN-REDD is the flagship UN knowledge and advisory partnership on forests and climate to reduce forest emissions and enhance forest carbon stocks. UN-REDD is the largest international provider of REDD+ assistance, supporting its 65 partner countries to protect their forests and achieve their climate and sustainable development goals. **So, Statement 1 is not correct.**

REDD+ is a framework created by the UNFCCC Conference of the Parties (COP) to guide activities in the forest sector that reduces emissions from deforestation and forest degradation, as well as the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries.

Implementing REDD+ activities is voluntary and depends on each developing country's national circumstances, capacities and capabilities, and the level of support received. **So, Statement 2 is correct.**

REDD+ programme is intended to strengthen the conservation regime of the forests, along with ensuring the livelihood and food security of the forest-dwelling Scheduled Tribes and other traditional forest dwellers.

REDD+ programme aims at the implementation of activities by national governments to reduce human pressure on forests that result in greenhouse gas emissions at the national level, but as an interim measure also recognizes subnational implementation.

The implementation of REDD+ activities is voluntary and depends on the national circumstances, capacities and capabilities of each developing country and the level of support received. Thus Implementation of the REDD+ program will not always strengthen the Rights of Forest Tribal and Other Traditional Dwellers.

The Government of India has recognized the forest rights of the indigenous communities through the enactment of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The Act bestows on the local indigenous communities the responsibilities and authority for the sustainable use of forests, conservation of biodiversity and maintenance of ecological balance. **So, Statement 3 is not correct.**

The REDD+ mechanism contributes directly to achieving Sustainable Development Goals (SDGs) 13 and 15. Those address climate change, reducing deforestation and sustainable use of ecosystems. REDD+ can also contribute to achieving other SDGs – including those which address poverty reduction, health and well-being, hunger alleviation, and improving institutions. **So, Statement 4 is correct.**

ADDITIONAL INFORMATION:

REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION (REDD+)

Phases

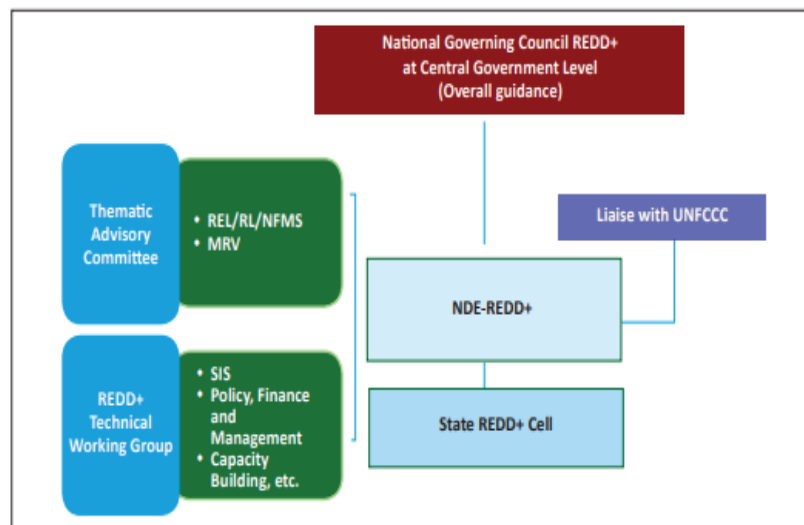


Figure 4.1: Institutional Mechanism for REDD+ implementation in India.

Q.19) Consider the following statements :

1. India launched the "P3 movement" that underlines climate change commitments at WEF Davos Agenda 2022.
2. P3 is a part of the National Action Plan on Climate change (NAPCC) which creates an ecosystem to be self-sustainable.

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

EXPLANATION:

The World Economic Forum's Davos Agenda Virtual Summit hosted world leaders and heads of important institutions and organisations worldwide to discuss climate action, pandemic recovery, and economic and social resilience.

India's Prime Minister introduced the "p3 Movement" (Pro planet people) that underlines India's climate change commitments at World Economic Forum Davos Agenda 2022. **So, Statement 1 is Correct.**

The Prime Minister introduced the idea of LiFE (Lifestyle for Environment) during the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow last year with the vision of such a Resilient and Sustainable Lifestyle that will be useful in dealing with Climate Crisis as well as future Unpredictable Challenge.

The Mission plans to create and nurture a global network of individuals, namely 'Pro-Planet People' (P3), who will have a shared commitment to adopt and promote environmentally friendly lifestyles. Through the P3 community, the Mission seeks to create an ecosystem that will reinforce and enable environmentally friendly behaviors to be self-sustainable. Thus P3 is not part of the National Action Plan on Climate change (NAPCC). **So, Statement 2 is not Correct.**

ADDITIONAL INFORMATION:**REITERATED CLIMATE COMMITMENTS DURING WEF'S DAVOS AGENDA 2022**

- About**
- AT COP 26 in Glasgow, India announced that India had set a net-zero carbon emissions target by 2070.
 - India also updated its Intended Nationally Determined Contributions (INDCs) that have to be met by 2030
 - India's new pledge included increasing the country's installed renewable capacity to 500 GW, meeting 50 percent of its energy requirements from non-fossil fuel sources.
 - At COP 21 in Paris, India made similar ambitious announcements and aimed to reduce the economy-wide emissions intensity by 33-35 percent from 2005 levels by 2030.
 - In August, the Ministry of New and Renewable Energy announced that the country had installed 100 GW of renewable energy capacity.
 - While this is a milestone, India is on track to accomplishing only about two-thirds of its planned renewable target of 175 GW installation by 2022.

Q.20) Consider the following statements with reference to 'loss and damage' in response to climate change :

1. Article 8 of the Paris Agreement enshrines the role of sustainable development in reducing the risk of loss and damage.
2. Limiting global temperature to close to 1.5°C would substantially reduce projected losses and damages and eliminate them all.
3. The Glasgow Dialogue was established in COP 26 between Parties and stakeholders to discuss the funding arrangements to avert, minimize and address loss and damage.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 only
- (c) **1 and 3 only**
- (d) 3 only

EXPLANATION:

The Paris Agreement builds on the UN Framework Convention on Climate Change, bringing all nations into a common cause to rapidly reduce greenhouse gas emissions and strengthen countries' ability to build resilience and adapt to the impacts of climate change, including through ensuring adequate support for developing countries.

Article 8 of the Paris Agreement states that Parties recognize the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage. **So, Statement 1 is correct.**

As synthesized by the Intergovernmental Panel on Climate Change (IPCC), Near-term actions that limit global warming to close to 1.5°C would substantially reduce projected losses and damages related to climate change in human systems and ecosystems but cannot eliminate them all. Further adaptation does not prevent all losses and damages, even with effective adaptation. **So, Statement 2 is not correct.** Santiago Network and the Glasgow Dialogue aim to increase tangible support and finance for loss and damage in developing countries.

COP 26 established the Glasgow Dialogue between Parties, relevant organizations, and stakeholders to discuss the arrangements for funding activities to avert, minimize and address loss and damage associated with the adverse impacts of climate change. The dialogue takes place each year at the first session of the Subsidiary Body for Implementation until it is concluded at its sixtieth session (SB 60, June 2024). **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:**LOSS AND DAMAGE**

- Santiago Network**
- COP 25 established the Santiago Network to catalyze technical assistance of relevant organizations, bodies, networks, and experts for the implementation of relevant approaches for averting, minimizing and addressing loss and damage at the local, national and regional levels in developing countries that are particularly vulnerable to the adverse effects of climate change.
 - A set of functions of the Network was agreed upon at COP 26 to facilitate the provision of needs-based technical assistance in developing countries.

Q.21) Consider the following statements :

1. At COP26, the Forest and Climate Leaders' Partnership (FCLP) was launched.
2. FCLP helps to scale up action to halt and reverse forest loss and land degradation by 2050.
3. Supporting Indigenous Peoples' and local communities' initiatives is one of the action areas of FCLP.

Which of the statements given above is/are correct ?

- (a) 1 only
- (b) 2 and 3 only
- (c) **3 only**
- (d) 1 and 3 only

EXPLANATION:

At the UN Climate Change Conference or Conference of the Parties, COP27 in Sharm el-Sheikh Forest and Climate Leaders' Partnership (FCLP) has been launched, which aims to unite action by governments, businesses and community leaders.

World Leaders from 26 countries and the European Union (EU) have launched the Forests and Climate Leaders' Partnership (FCLP) at the inaugural Forest and Climate Leaders' Summit.

The new Partnership will unite action by government, business and community leaders and shine a

spotlight on global progress at COP27 and every year up to 2030.

So, Statement 1 is not correct.

The Forest and Climate Leaders’ Partnership (FCLP) has high ambition partnership of countries that will build on the Glasgow Leaders Declaration for Forests and Land Use made by 140+ countries to halt and reverse forest loss and land degradation by 2030 while delivering sustainable development and promoting an inclusive rural transformation.

So, Statement 2 is not correct.

Every member is committing to play a leadership role in driving forward at least one of the FCLP’s action areas, which are:

- International collaboration on the sustainable land use economy.
- Mobilizing public and donor finance to support implementation.
- Shifting the private finance system.
- Supporting Indigenous Peoples’ and local communities’ initiatives.
- Strengthening and scaling carbon markets for forests.
- Partnerships and incentives for preserving high-integrity forests.

So, Statement 3 is correct.

ADDITIONAL INFORMATION:

CONFERENCE OF THE PARTIES (COP)

Sessions

Location	Session	Conference
Sharm el-Sheikh, Egypt	COP 27	Sharm el-Sheikh Climate Change Conference - November 2022
Glasgow, United Kingdom of Great Britain and Northern Ireland	COP 26	Glasgow Climate Change Conference – October- November 2021
Madrid, Spain	COP 25	UN Climate Change Conference - December 2019
Katowice, Poland	COP 24	Katowice Climate Change Conference – December 2018
Bonn, Germany	COP 23	UN Climate Change Conference - November 2017
Marrakech, Morocco	COP 22	Marrakech Climate Change Conference - November 2016
Paris, France	COP 21	Paris Climate Change Conference - November 2015
Lima, Peru	COP 20	Lima Climate Change Conference - December 2014

Warsaw, Poland	COP 19	Warsaw Climate Change Conference - November 2013
Doha, Qatar	COP 18	Doha Climate Change Conference - November 2012
Durban, South Africa	COP 17	Durban Climate Change Conference - November 2011
Cancun, Mexico	COP 16	Cancún Climate Change Conference - November 2010
Copenhagen, Denmark	COP 15	Copenhagen Climate Change Conference - December 2009
Poznan, Poland	COP 14	Poznan Climate Change Conference - December 2008
Bali, Indonesia	COP 13	Bali Climate Change Conference - December 2007
Nairobi, Kenya	COP 12	Nairobi Climate Change Conference - November 2006
Montreal, Canada	COP 11	Montreal Climate Change Conference - December 2005
Buenos Aires, Argentina	COP 10	Buenos Aires Climate Change Conference - December 2004
Milan, Italy	COP 9	Milan Climate Change Conference - December 2003
New Delhi, India	COP 8	New Delhi Climate Change Conference - October 2002
Marrakech, Morocco	COP 7	Marrakech Climate Change Conference - October 2001
Bonn, Germany	COP 6-2	Bonn Climate Change Conference - July 2001
The Hague, Netherlands	COP 6	The Hague Climate Change Conference - November 2000
Bonn, Germany	COP 5	Bonn Climate Change Conference - October 1999
Buenos Aires, Argentina	COP 4	Buenos Aires Climate Change Conference - November 1998
Kyoto, Japan	COP 3	Kyoto Climate Change Conference - December 1997

Q.22) Which of the following are the effects of sea level rise due to climate change?

1. A LEDS (Low Emission Development Strategy) is a policy instrument that identifies the sources of a country's GHG emissions.
2. A LEDS helps to improve framework conditions for private sector investment in mitigation actions.
3. Through LEDS some countries focus only on the mitigation aspect of climate change.
4. India submitted its Long-Term Low Emission Development Strategy to the UNFCCC at COP26.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 3 and 4 only
- (c) **1,2 and 3 only**
- (d) 2,3 and 4 only

EXPLANATION:

A Low-Emission Development Strategy (LEDS) is a national, high-level, comprehensive, long-term strategy developed by domestic stakeholders aiming to decouple economic growth and social development from greenhouse gas (GHG) emissions growth.

A LEDS is a policy instrument that identifies the sources of a country's GHG emissions and prioritizes options for their mitigation. **So, Statement 1 is correct.**

A Low Emission Development Strategy helps to improve framework conditions for private sector investment in mitigation actions.

The long-term strategies of LEDS framework will be a core tool to help productive sectors in business and industry identify the opportunities for economic growth in the low-carbon transition. It will also help achieve inclusive growth and other sustainable development goals. **So, Statement 2 is correct.**

A Low-Emission Development Strategy (LEDS) focuses on achieving development through mitigation actions.

Through LEDS, some countries have included a full vulnerability analysis and a description of necessary adaptation measures in their LEDS. Other countries focused only on the mitigation aspect of climate change. **So, Statement 3 is correct.**

Long-term low emissions development strategies (LT-LEDS) are a policy tool that helps to place short-term actions in the context of the long-term structural changes required to transition to a low-carbon, resilient economy.

Recently, India submitted its Long-Term low emission development strategy at the 27th United Nations Framework Convention on Climate Change (UNFCCC), Conference of Parties (COP27), which is aimed at the rational utilization of national resources concerning energy security. Therefore, the Low Emission Development Strategy to the UNFCCC is outside of COP26. **So, Statement 4 is not correct.**

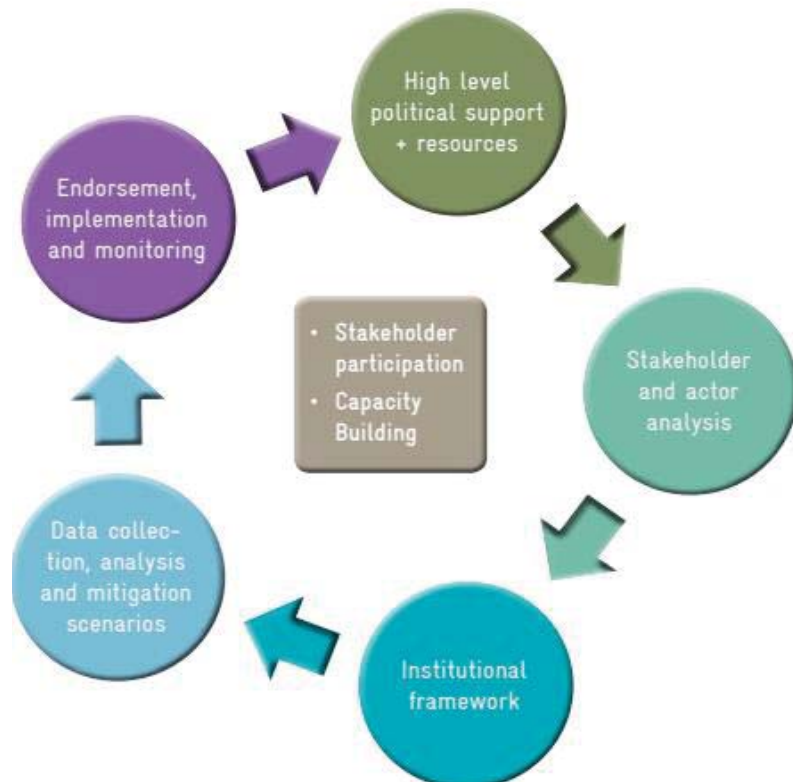
ADDITIONAL INFORMATION:

LEDS (LOW EMISSION DEVELOPMENT STRATEGY)

- LEDS Purposes**
- At the domestic level, the LEDS is a country-driven policy instrument for national decision-making.
 - The LEDS merges climate change action with national development and helps identify and prioritize appropriate mitigation actions (NAMAs) nationally by comprehensively analyzing mitigation potentials, costs and co-benefits.
 - The LEDS supports sector transformation through a national, economy-wide approach.
 - On the international level, LEDS supports the global goal of GHG emission reduction.
 - LEDS may help to attract international support (finance, capacity building, technology transfer) and recognition of NAMAs that are being planned and implemented by developing countries.



Process of Developing a LEDS



Q.23) Which of the following are the effects of sea level rise due to climate change ?

1. Leads to “drowning” wetlands
2. Out-migration of people
3. Decrease in surface area of the oceans
4. Contaminates soil and groundwater
5. Occurrence of Global Stilling
6. Rapid melting of ice sheets

Select the correct answer from the code given below :

- (a) 1,2,3,4 and 5 only
- (b) 1,3,5 and 6 only
- (c) **1,2,4,5 and 6 only**
- (d) 1,2,3,4 and 6

EXPLANATION:

Global warming is caused by climate change, which causes sea level rise.

Sea level rise means an increase in the level of the world’s oceans due to the effects of global warming.

Due to sea level rise, Wetlands are vulnerable to drowning at high rates. For instance, in 2020 Super Cyclone Amphan, seawater came in 25 kilometers inland, inundating large parts of the Sunderbans delta, which is already the most vulnerable to cyclones and sea-level rise in India.

The Consequences of Sea level rise include the increased intensity of storm surges, flooding, and that damage to coastal areas that causes a serious threat to coastal life around the world. If water continues to rise, coastal living people are forced to abandon their homes and move to another area as they are forced to migrate (Out-migration of people), which results from climate change.

When water is heated by temperature rise due to global warming, it tends to expand due to the Thermal expansion of water, and the oceans take up more space.

As sea levels rise, low-lying coastal areas are increasingly being inundated with saltwater, gradually contaminating the soil. The rising seas can contaminate soil and groundwater with salt and may cause soil erosion and wetland flooding.

Global Stilling is the phenomenon where the wind speed around the world decrease, which could impact wind energy production and plant growth worldwide. Scientists have predicted that the decline in wind speed is because of the rise of carbon dioxide and global warming. The Intergovernmental Panel on Climate change says that by 2100, average wind speeds could drop by up to 10 percent.

Land-based ice, such as glaciers and ice sheets, is greatly affected by global warming. The increase in sea levels is the major reason for the accelerated ice loss from the ice sheets in the Arctic and Antarctic regions. Therefore, the surface area increases due to sea level rise. Hence, the effects of rising sea levels do not decrease in the surface area of the oceans. **So, Option (c) is correct.**

Q.24) Consider the following statements :

1. The Global Lighthouse Network is a World Bank initiative in collaboration with McKinsey & Company.
2. The Global Lighthouse Network is a community of manufacturers that leads in applying Fourth Industrial Revolution technologies.

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

EXPLANATION:

- The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. The fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that blurs the lines between the physical, digital, and biological spheres.
- The global manufacturing community is lagging behind in its adoption of Fourth Industrial Revolution technologies.
- More than 70% of companies are stuck in “pilot purgatory” (Pilot purgatory is an operating model that will slow adoption in large companies and kill startups), whereas the other group of leading manufacturers is able to do advanced manufacturing, generating new value and customer experiences within the factory.
- To accelerate a more comprehensive and inclusive adoption of advanced technologies in manufacturing (Fourth Industrial Revolution technologies), the World Economic Forum initiated the Global Lighthouse Network in collaboration with McKinsey & Company.

So, Statement 1 is not correct, and Statement 2 is correct.

ADDITIONAL INFORMATION:

WORLD ECONOMIC FORUM (WEF)

- | | |
|----------------|---|
| About | <ul style="list-style-type: none">➤ The World Economic Forum (WEF) is an international organization headquartered in Geneva, Switzerland that brings together individuals and political and business leaders each year to discuss significant global economic issues. These include but are not limited to political, economic, social, and environmental concerns.➤ It is best known for its annual meeting in Davos, Switzerland, which brings together business and political leaders and thinkers to discuss global issues and solutions.➤ The organization is funded through its membership, which includes much prominent business and political figures. |
| Reports | <ul style="list-style-type: none">➤ Global Gender Gap Index➤ Travel and Tourism Competitiveness Report➤ Inclusive Development Index➤ Enabling Trade Report➤ Global Environment Performance Index➤ Global Competitiveness Report |

Q.25) With reference to Climate Neutral Now Initiative, consider the following statements :

1. It was launched by the World Meteorological organisation to increase climate action by engaging non-Party stakeholders.
2. Its mandate is to promote the voluntary use of carbon market mechanisms.
3. The Climate Neutral Now Initiative has no participation fee.
4. A participant can stop participating at any point in time.

Which of the statements given above is/are **not** correct ?

- (a) 1,3 and 4 only
- (b) **1 only**
- (c) 2 and 4 only
- (d) 3 only

EXPLANATION:

The Climate Neutral Now Initiative is one of several initiatives launched by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat to increase climate action by engaging non-Party stakeholders like sub-national governments, companies, organizations, and individuals. **So, Statement 1 is not correct.**

The Climate Neutral Now Initiative was launched in 2015 following a mandate to promote the voluntary use of the Clean Development Mechanism (CDM).

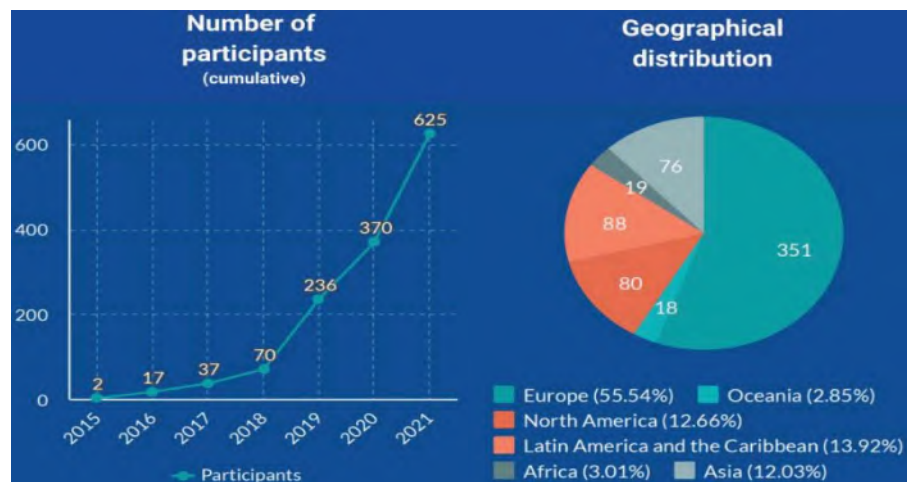
The CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO2. These CERs can be traded and sold and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol. Thus the Climate Neutral Now Initiative promotes the voluntary use Clean Development Mechanism (CDM), which is a carbon market mechanism. **So, Statement 2 is correct.**

It encourages and supports organizations and other interested stakeholders to act now in order to achieve a climate-neutral world by 2050, as enshrined in the Paris Agreement. The initiative is not a certification scheme for its participants. It has no participation fee, and in addition to that, a participant can stop participating at any point in time. **So, Statements 3 & 4 are correct.**

ADDITIONAL INFORMATION:

CLIMATE-NEUTRAL NOW INITIATIVE

Participants of the initiative



- Climate Neutral Now aims to promote ambitious and credible action while remaining flexible enough to allow both large and small organizations to participate.
- Participants must estimate their carbon footprint, plan and implement actions to reduce it, -optionally- compensate for the emissions that cannot be avoided yet, and report yearly.

**Benefits to
the
participants**



Q.26) Consider the following statements :

1. The Accelerating to Zero coalition (A2Z) was launched at COP27.
2. It amplifies the progress in ZEVs (Zero Emission Vehicles) and promotes zero air pollution all over the earth.
3. India is not a signatory to A2Z.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) **1 only**
- (c) 2 and 3 only
- (d) 3 only

EXPLANATION:

Accelerating to Zero (A2Z) Coalition was launched at the conference of parties (COP27) as the next step to secure more ambitious commitments to zero-emission vehicles transition aligned with the Paris Agreement. The A2Z Coalition connects the world's leading organizations on zero-emission transportation, creating a platform to support understanding, developing, and implementing ambitious zero-emission

transportation policies and plans and showcasing leadership. **So, Statement 1 is correct.**

The A2Z Coalition will provide a platform to support coordination between leading initiatives, signpost to implementation support for signatories to access, amplify the progress being made as well as the continued urgency to advance the transition from polluting vehicles to ZEVs, whereby promotion of zero air pollution all over the earth is not the mandate of A2Z Coalition. **So, Statement 2 is not correct.**

India is a signatory to the Accelerating to Zero coalition (A2Z) under the category of Governments in Emerging Markets and Developing Economies. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

ACCELERATING TO ZERO

- About**
- The A2Z Coalition is a partnership of the UK Government’s COP26 Presidency, The High-Level UN Climate Champions, the International Council on Clean Transportation, Climate Group, and the Drive Electric Campaign working towards all sales of new cars and vans being zero emission no later than 2035 in leading markets and 2040 globally.
 - The A2Z Coalition builds off the momentous foundation of the “Zero Emission Vehicles Declaration” (ZEV Declaration) generated at COP26 and hosted by the UK COP Presidency in collaboration with the Climate Change High-Level Champions and the Climate Group.
 - It connects the world’s leading organizations on zero-emission transportation, creating a platform to support understanding, developing, and implementing ambitious zero-emission transportation policies and plans and showcasing leadership.

GETTING TO ZERO COALITION

- About**
- The Getting to Zero Coalition is a partnership between the Global Maritime Forum and the World Economic Forum. It brings together decision-makers from across the shipping value chain with key stakeholders from the energy sector as well as from governments and Intergovernmental organisations (IGOs).
 - The Getting to Zero Coalition is a powerful alliance of more than 200 organizations (including 160 companies) within the maritime, energy, infrastructure and finance sectors, supported by key governments and IGOs.
 - The Coalition is committed to getting commercially viable deep-sea zero-emission vessels powered by zero-emission fuels into operation by 2030 towards full decarbonization by 2050

Q.27) Consider the following statements :

1. NASA’s Martian Moons Exploration (MMX) is a robotic space probe set for launch in 2024 to bring back the first samples from Mars' largest moon Phobos.
2. It was designed to clarify the origin of the Martian moons and the process of evolution for the Mars region.

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

EXPLANATION:

MMX (Martian Moons exploration) is a mission to explore the Martian moons.

The Mars Moons exploration (MMX) mission is in development by the Japan Aerospace Exploration Agency (JAXA).

The Martian Moons exploration (MMX) is a robotic space probe set for launch in 2024, and MMX is

planning to collect surface material from Phobos and bring it back to the first samples from Mars' largest moon Phobos. **So, Statement 1 is not correct.**

NASA has recently revised the version of Martian Moons exploration mission from Moon to Mars, forming a blueprint for shaping exploration throughout the solar system.

The Mars exploration mission was designed to clarify the Martian moons' origin and the process of evolution for the Mars region. It is planned for the mission to observe Mars' two moons, Phobos and Deimos, and to return to the Earth with a sample collected from one of these moons. **So, Statement 2 is correct.**

Q.28) Which of the following best describes the Environment Impact Assessment (EIA)?

- (a) It is the process of identifying, predicting and evaluating the bio-physical and social effects of development proposals to make decisions.
- (b) It is a decision-making tool that compares various alternatives for a project and seeks to identify the best combination of economic and environmental costs.
- (c) EIA is a decision-making tool that identifies the environmental and social impacts of a project.
- (d) **None of the above**

EXPLANATION:

The United Nations Environment Programme (UNEP) defines Environmental Impact Assessment (EIA) as a tool used to identify a project's environmental, social and economic impacts prior to decision-making.

The following definition below best describes the Environment Impact Assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made." **So, Option (d) is correct.**

ADDITIONAL INFORMATION:

ENVIRONMENT IMPACT ASSESSMENT (EIA)

About Environmental Impact Assessment (EIA) evaluates the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

Components of An EIA

- **Screening** to determine which projects or developments require a full or partial impact assessment study;
- **Scoping** to identify which potential impacts are relevant to assess (based on legislative requirements, international conventions, expert knowledge and public involvement), to identify alternative solutions that avoid, mitigate or compensate adverse impacts on biodiversity and finally to derive terms of reference for the impact assessment;
- **Assessment and evaluation of impacts and development of alternatives**, to predict and identify the likely environmental impacts of a proposed project or development, including the detailed elaboration of alternatives;
- **Reporting the Environmental Impact Statement (EIS)** including an environmental management plan (EMP), and a non-technical summary for the general audience.
- **Review of the Environmental Impact Statement (EIS)**, based on the terms of reference (scoping) and public (including authority) participation.
- **Decision-making** on whether to approve the project or not, and under what conditions; and
- **Monitoring, compliance, enforcement and environmental auditing.** Monitor whether the predicted impacts and proposed mitigation measures occur as defined in the EMP. Verify the compliance of proponent with the EMP, to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion.

- UNEP** The United Nations Environment Programme (UNEP) is the global authority that sets the environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the UN system and serves as an authoritative advocate for the global environment.
- It was established in 1972.
- Headquarter** United Nations Environment Programme Headquarters is located in Nairobi, Kenya.
- Member States** ➤ It consists of 193 member states.
- of UNEP** ➤ UNEP supports Member States to ensure that environmental sustainability is reflected in development and investment planning and provides countries with the necessary tools and technologies to protect and restore the environment.

Q.29) With reference to the World Heritage Committee(WHC),consider the following statements :

1. The World Heritage Committee is composed of 21 members elected by their General Assembly.
2. The Committee allocates financial assistance to the parties.
3. WHC can decide on the inscription but cannot decide on the deletion of properties on the List of World Heritage in Danger.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) **1 and 2 only**
- (c) 2 only
- (d) 3 only

EXPLANATION:

The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to encourage the identification, protection and preservation of cultural and natural heritage worldwide considered to be of outstanding value to humanity, and this is embodied in an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by UNESCO in 1972.

The World Heritage Committee consists of representatives from 21 state parties to the World Heritage Convention elected by their General Assembly.

So, Statement 1 is correct.

The World Heritage Committee is responsible for implementing the World Heritage Convention, which defines the use of the World Heritage Fund and allocates financial assistance upon requests from States Parties. **So, Statement 2 is correct.**

The List of World Heritage in Danger is designed to inform the international community of conditions that threaten the very characteristics for which a property was inscribed on the World Heritage List and to encourage corrective action.

The intergovernmental World Heritage Committee makes the final decision on its inscription and meets once a year to decide which sites will be inscribed on the World Heritage List.

When a site loses the characteristics which determined its inscription on the world Heritage List, the World Heritage Committee may decide to delete the property from both the List of World Heritage in Danger and the World Heritage List. Therefore, World Heritage Committee can decide on the inscription and deleting properties on the List of World Heritage in Danger. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

WORLD HERITAGE COMMITTEE

- Recently in News** ➤ UNESCO added two new Heritage Sites from India to the World Heritage List.
- The newly inscribed sites are as follows:

**Kakatiya Rudreshwara (Ramappa) Temple,
Telangana
Dholavira -A Harrapan City, Gujarat**

- History** ➤ Creating an international movement for protecting heritage emerged after World War I.
➤ The 1972 Convention concerning the Protection of the World Cultural and Natural Heritage developed from the merging of two separate movements:
➤ the first focusing on the preservation of cultural sites, and
➤ the other dealing with the conservation of nature.
- Heritage Sites** ➤ Currently, there are 40 World Heritage Sites located in India. Out of these, 32 are cultural, 7 are natural, and one, the Khangchendzonga National Park, is of mixed type.
- In India** ➤ India has the sixth-largest number of sites in the world.

Q.30) Consider the following statements with reference to the Eastern Ghats :

1. It is an ancient discontinuous low mountain range older than the Western Ghats.
2. Eastern Ghats Wildlife Society (EGWS) is an initiative of the Environmental ministry which promotes community-based wildlife conservation in the Eastern Ghats region.
3. Soara, Kol, Chenchus, and Paliars are the tribes of Eastern Ghats.

Which of the statements given above is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) **1 and 3 only**
- (d) 2 and 3 only

EXPLANATION:

The Eastern Ghats or Kizhakku thodarchi malaigal or Pūrva Ghaṭ or toorpu kanumalu, also known as Mahendra Parvatam in the south, are a discontinuous range of mountains along India's eastern coast. The Eastern Ghats run from northern Odisha through Andhra Pradesh to Tamil Nadu in the south passing some parts of Karnataka. They are eroded and cut through by the four major rivers of peninsular India, known as the Godavari, Mahanadi, Krishna, and Kaveri.

The Eastern Ghats are older than the Western Ghats and have a complex geologic history related to the assembly and breakup of the ancient supercontinent of Rodinia and the assembly of the Gondwana supercontinent. Geologically it is a part of the Indian Peninsula which was a part of the ancient land mass of Gondwanaland and at their southern end, the Eastern Ghats form several ranges of low hills. **So, Statement 1 is correct.**

Eastern Ghats Wildlife Society (EGWS) is a non-profit organization that promotes community-based wildlife conservation in the Eastern Ghats region of South India through education, conservation-oriented research, public participation, institutional capacity building, and sustainable development. It is registered under the Andhra Pradesh Societies Registration Act, 2001 with a vision to conserve the biodiversity of Eastern Ghats by harmonizing the public with nature.

Hence, it is not an initiative by the Environment Ministry but a Non-Profit Organisation. **So, Statement 2 is not correct.**

The Eastern Ghats land is occupied by quite a few tribes which include Khonds, Soara, Kolha, Bhuinya, Kharia, Koya, and Kol in Odisha and Bagatas, Chenchus, Jatapas, Kondas in Andhra Pradesh. Malayalis and Paliars are the key tribes in Tamil Nadu. These indigenous people have their own unique cultural heritage.

These people follow age-old customs and traditions. They are still dependent on the forest produce and hunting for their livelihood. These tribes have good knowledge about the region and its produce and thereby make good use of its medicinal plants.

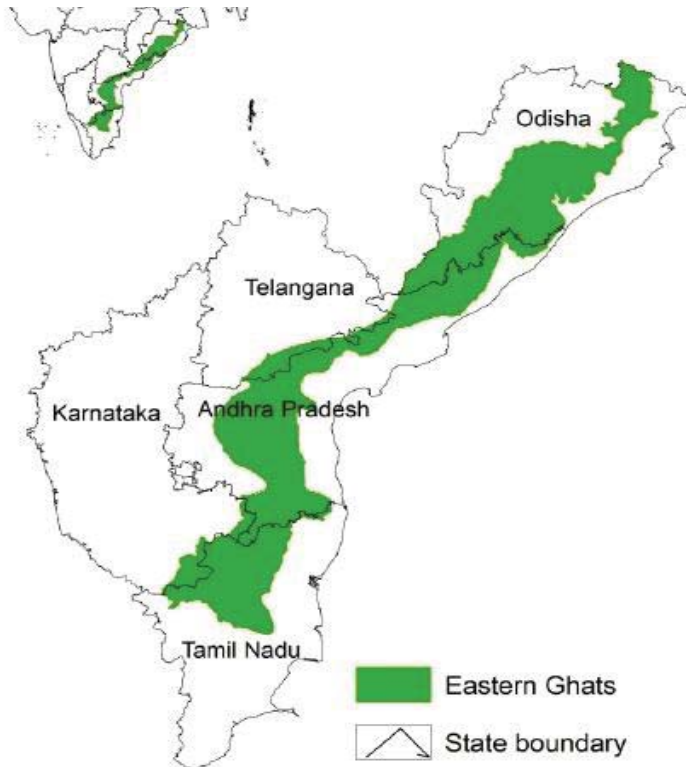
So, Statement 3 is correct.

ADDITIONAL INFORMATION:

EASTERN GHATS

- Geography**
- The mountain ranges run parallel to the Bay of Bengal. The Deccan Plateau lies to the west of the range, between the Eastern Ghats and the Western Ghats.
 - The coastal plains, including the Coromandel Coast region, lie between the Eastern Ghats and the Bay of Bengal. The Eastern Ghats are not as high as the Western Ghats.
 - The Eastern Ghats are made up of charnockites, granite gneiss, khondalites, metamorphic gneisses, and quartzite rock formations. The structure of the Eastern Ghats includes thrusts and strike-slip faults all along its range. Limestone, bauxite, and iron ore are found in the Eastern Ghats' hill ranges.
 - The Eparchaean Unconformity of the Tirumala Hills is a major discontinuity of stratigraphic significance that represents an extensive period of erosion and non-deposition. It is seen at the steep natural slopes, road scars, and ravines in the Tirumala ghat roads in the Chittoor district of Andhra Pradesh.
- Rivers**
- The Eastern Ghats are the source points for many small and medium rivers along the eastern coastal plains of South India.
 - Rivers flowing through the Eastern Ghats include:
 - Godavari
 - Kaveri
 - Krishna
 - Mahanadi
 - Tungabhadra
 - Rivers originating on the Eastern Ghats include:
 - Bahuda River
 - Rushikulya River
 - Vamsadhara River
 - Nagavali River
 - Champavathi River
 - Vegavathi River
 - Gosthani River
 - Sarada River
 - Varaha River
 - Tandava River
 - Indravathi River
 - Sabari River
 - Sileru River
 - Tammileru
 - Gundlakamma River
 - Pennai Yaru River
 - Swarnamukhi
 - Kundu River
 - Vellar River
 - Papaghni River
 - Chitravati River

- Protected Areas**
- Badrama Wildlife Sanctuary, Odisha
 - Coringa Wildlife Sanctuary, Andhra Pradesh
 - Gundla Brahmeswaram Wildlife Sanctuary, Andhra Pradesh
 - Nagarjunsagar-Srisailem Tiger Reserve, Andhra Pradesh, and Telangana
 - Papikonda Wildlife Sanctuary, Andhra Pradesh
 - Satkosia Tiger Reserve, Odisha
 - Simlipal National Park, Odisha
 - Sunabeda Tiger Reserve, Odisha
 - Vedanthangal Bird Sanctuary, Tamil Nadu



- Q.31) Consider the following statements with reference to the Saguna Rice technique(SRT) :
1. SRT is a Conservation Agriculture type of cultivation method developed by the Indian Council for Agriculture Research.
 2. SRT insists that all roots and small portions of the stem should be left in the beds for slow rotting.
 3. SRT system avoids the usage of weedicides to control weeds.
 4. The SRT system helps in the early harvesting of crops.
- Which of the statements given above is/are correct?
- (a) 1 and 3 only
 - (b) 1,2 and 3 only
 - (c) **2 and 4 only**
 - (d) 1,2,3 and 4

EXPLANATION:

Saguna Rice Technique is a unique new method of cultivating rice and related rotation crops without ploughing, puddling and transplanting (rice) on permanent raised beds.

Chanrdashekhar H Bhadsavle developed Saguna Rice (SRT) cultivation method. SRT is a zero till, Conservation Agriculture (CA) type of cultivation method evolved at SagunaBaug, Neral, Dist. Raigad, Maharashtra. Hence, it is not developed by Indian Council for Agriculture Research. **So, Statement 1 is not correct.**

Saguna Rice Technique insists that all roots and a small portion of the stem should be left in the beds for slow rotting. In Saguna Rice Technique, the roots of the previous crop are kept in the raised bed because the capillaries formed by dead dry roots and earthworm pathways facilitate quick rainwater draining, resulting in effective recharging of Aquifers. **So, Statement 2 is correct.**

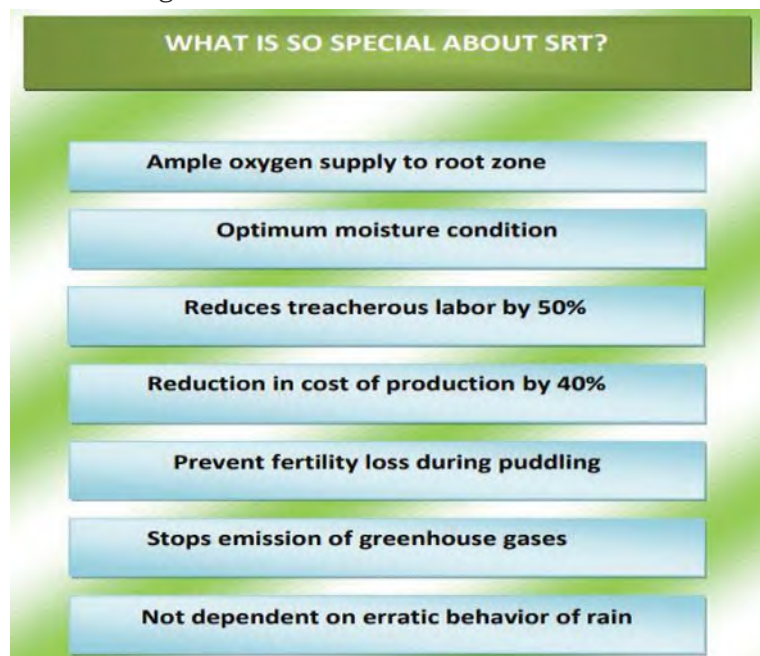
Saguna Rice Technique has an important principle that the weeds are to be controlled with weedicides and manual labor. No ploughing, puddling and hoeing (Primitive forms of agriculture, defined by the absence of the plough) are to be done to control weeds. **So, Statement 3 is not correct.**

The Saguna Rice technique (SRT) system will get the crop ready for harvesting 8 to 10 days earlier. Rice crop gets ready 8–10 days earlier, and it also saves time required for soil tilling between two crops, and this enables the farmers to cultivate more than one crop in the same plot in a year. **So, Statement 4 is correct.**

ADDITIONAL INFORMATION:

SAGUNA RICE TECHNIQUE(SRT)

- About**
- SRT is a Zero Tillage Conservation Agriculture (CA) cultivation method evolved at SagunaBaug, Neral, Dist. Raigad, Maharashtra.
 - The SRT method is implemented under the National Food Security Mission 2015-16 in Medha and Kudal Agriculture Circle of Jalgaon Taluka.



Impacts

IMPACTS



Impact on Farmer

- ✓ Farmers become more confident about their profession.
- ✓ Lost dignity toward farming is regained through various systematic procedures carried out in SRT.
- ✓ Farmers have gain independence from the problem of labor shortage.



Impact on Soil

- ✓ Fragrance of a soil improved in the process of keeping roots beneath the earth surface.
- ✓ Soil becomes more productive.
- ✓ Water holding capacity of soil has been drastically improved.



Impact on Nature

- ✓ Presence of earthworm in farms attracts some of the rare species of birds, so it improves the eco-system.
- ✓ Groundwater level increases.
- ✓ Reduction in Methane Gas generation.
- ✓ It reduces water, Fertilizers & other chemicals requirements.

Comparison

Comparative analysis of SRT and Conventional Rice Method		
Parameter	Conventional Practice	SRT Method
Fertilizers	Use of little or no organic manure or chemical fertilizers	Use of organic manure is ensured
Age of seedlings for ransplanting	20-25 days	Seed sowing is followed
No. of seedlings per hill	4-6	1-2
Weeding	little weeding	use of weedicides
Plant Height	84cm	90cm
No. of tillers per plant	12	17
Grain Production (Q/ha):	14.50	16.75
Hybrid rice yield (Q/ha):	15.00	17.50
Improved rice yield (Q/ha):	14.50	17.75
Local rice yield (Q/ha):	13.05	16.50

Q.32) Which of the following are the environmental effects of stratospheric ozone depletion?

1. Affects both orientation and motility in phytoplankton
2. Synthetic polymers are adversely affected
3. Snow blindness

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 only
- (c) 2 and 3 only
- (d) **1, 2 and 3**

EXPLANATION:

The ozone layer is a concentration of ozone molecules in the stratosphere. About 90 percent of the planet's ozone is in the ozone layer.

The stratosphere extends about 6 to 31 miles (or 10 to 50 km) above the Earth's surface.

Stratospheric ozone is a naturally occurring gas that filters the sun's ultraviolet (UV) radiation

The ozone depletion process begins when CFCs (chlorofluorocarbons) and other ozone-depleting substances (ODS) are emitted into the atmosphere.

ODS molecules reach the stratosphere, about 10 km above the Earth's surface.

There are three types of UV light: UVA, UVB, and UVC.

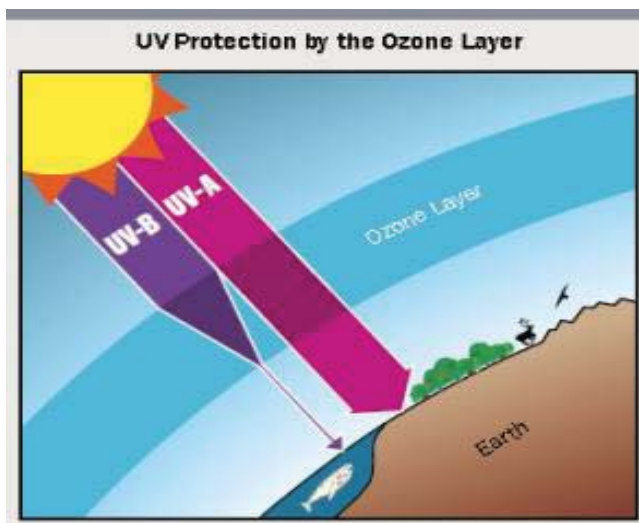
Reductions in stratospheric ozone levels will lead to higher levels of UVB reaching the Earth's surface.

The physiological and developmental processes of plants are affected by UVB radiation.

Phytoplankton forms the foundation of the aquatic food web, and its productivity is limited to the euphotic zone, the upper layer of the water column.

Highly Exposure to solar UVB radiation affects both orientation mechanisms and motility in phytoplankton, resulting in reduced survival rates for these organisms.

So, Statement 1 is correct.



Synthetic polymers are which are human-made polymers. Synthetic polymers, naturally occurring biopolymers (Biopolymers are polymers produced from natural sources either chemically synthesized from biological material or entirely biosynthesized by living organisms) and some other materials of commercial interest are adversely affected by UVB radiation. **So, Statement 2 is correct.**

Ozone layer depletion increases the amount of UVB that reaches the Earth's surface.

Ultraviolet radiation, UV-B radiation, can damage the cornea leading to photokeratitis or "snow blindness," and also causes cataracts through damage to the lens and the retina. **So, Statement 3 is correct.**

Q.33) Which of the following substances are controlled under the Montreal Protocol ?

1. CFCs
2. Halons
3. Methyl bromide
4. Ammonia
5. Methyl Chloroform
6. Propane

Select the correct answer from the code given below :

- (a) **1, 2, 3 and 5 only**
(b) 1, 5 and 6 only
(c) 1, 2, 3, 4 and 5 only
(d) 1, 2, 3, 4, 5 and 6

EXPLANATION:

The Montreal Protocol is a global agreement to protect the Earth's ozone layer by phasing out the chemicals that deplete it. It regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone-depleting substances (ODS).

The substances controlled by the treaty are listed in Annex A, Annex B, Annex C, Annex E and Annex F of this Protocol,

Annexure	Controlled Substance
A	CFCs, halons
B	other fully halogenated CFCs, carbon tetrachloride, methyl chloroform
C	Hydrochlorofluorocarbons(HCFC)
E	Methyl Bromide
F	hydrofluorocarbon(HFC)

- Ammonia is environmentally compatible. Ammonia doesn't deplete Earth's ozone layer or contribute to global warming like some fluorochemicals.
- Propane is a natural, nontoxic substance with no ozone-depleting properties and ultra-low global warming potential. **So, Option (a) is correct.**

Q.34) With reference to Hotspots and coolspots, Consider the following statements :

1. Western Ghats is recognized as one of the world's 'hottest hotspots' of biological diversity.
2. Cool spots are areas of the ocean that merits special protection because of its wildlife and significant underwater habitats.

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

EXPLANATION:

Biodiversity hotspots are defined as areas with exceptional species richness and concentrations of endemic species, and the loss of >70 per cent of the original primary vegetation. For example, 20% of the world's plants are found on 0.5% of the earth's surface. The Western Ghats is a designated UNESCO World Heritage Site and recognized as one of the world's eight 'hottest hotspots' of biological diversity.

'Hottest' biodiversity hotspots is based on richness and endemism of plants with

- 12,000 species of vascular plants in which >90 per cent endemic
- Vertebrates with >700 species in which 50 per cent endemism in birds,
- > 98 per cent in amphibians, reptiles and mammals,
- On habitat loss (estimated at >90 per cent).

The Western Ghats of India is older than the great Himalayan mountain chain, and are a geomorphic feature of immense global importance. A significant characteristic of the Western Ghats is the exceptionally high level of biological diversity and endemism. This mountain chain is recognized as one of the world's eight 'hottest hotspots' of biological diversity whereas the other hottest hotspots are

- Madagascar
- the Philippines
- Sundaland [South East Asia]
- Brazil's Atlantic Forest
- Caribbean
- Indo-Burma
- Eastern Arc and Coastal Forests of Tanzania/Kenya

So, Statement 1 is correct.

Hope Spots are new areas that need protection or existing marine protected areas where enhanced conservation action is needed. That is, it is an area of an ocean that needs special protection because of its wildlife and significant underwater habitats. The partnership between Mission Blue and IUCN on Hope Spots has great implications for community-sponsored conservation and will empower people to protect themselves, giving them a chance to be heard.

Whereas Cool spots refer to the areas where the world's last refuges with high numbers of threatened species still persist. Cool spots could be the result of protection or because of intact habitat that has not been cleared yet. Some of the "cool spots" identified include parts of the Amazon rainforest, Andes Mountains, and tundra and boreal forests of Russia and North America. **So, Statement 2 is not correct.**

ADDITIONAL INFORMATION:

BIODIVERSITY HOTSPOTS

- | | |
|-------------------|--|
| Criteria | To qualify as a biodiversity hotspot, a region must meet two strict criteria such as, <ul style="list-style-type: none"> ➤ It must have at least 1,500 vascular plants as endemics — which is to say, it must have a high percentage of plant life found nowhere else on the planet. A hotspot, in other words, is irreplaceable. ➤ It must have 30% or less of its original natural vegetation. In other words, it must be threatened. |
| Importance | <ul style="list-style-type: none"> ➤ Biodiversity underpins all life on Earth. Without species, there would be no air to breathe, no food to eat, and no water to drink. There would be no human society at all. And as the places on Earth where the most biodiversity is under the most threat, hotspots are critical to human survival. ➤ The map of hotspots overlaps extraordinarily well with the map of the natural places that most benefit people. That's because hotspots are among the richest and most important ecosystems in the world — and they are home to many vulnerable populations who are directly dependent on nature to survive. ➤ By one estimate, despite comprising 2.5% of Earth's land surface, the forests, wetlands, |

and other ecosystems in hotspots account for 35% of the “ecosystem services” that vulnerable human populations depend on.



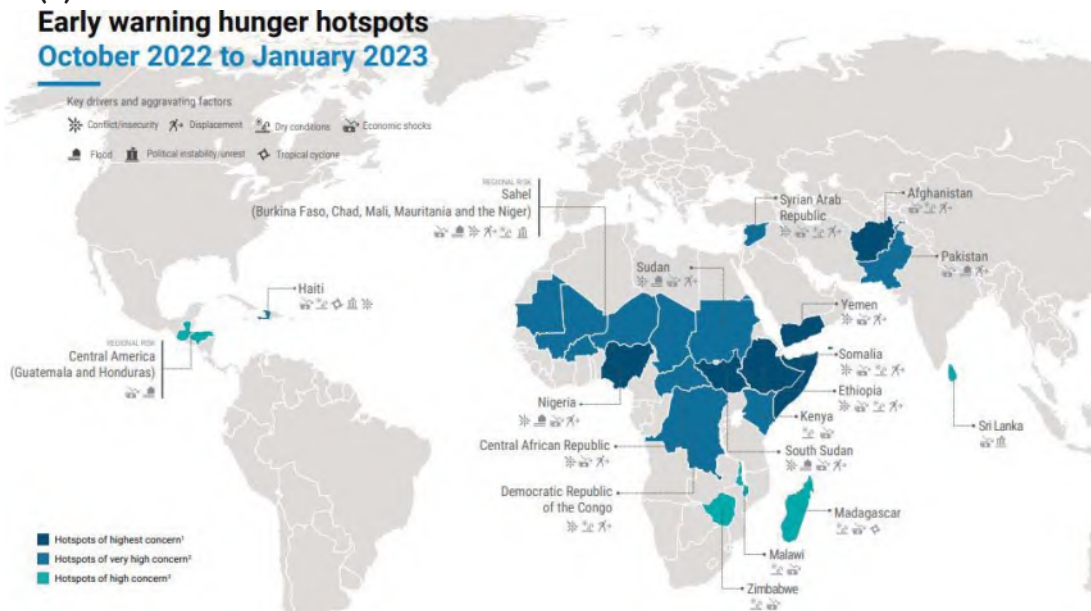
Q.35) Hunger hotspots outlook Report 2022 is released by which one of the following?

- (a) Food and Water watch
- (b) World Wildlife Fund for Nature
- (c) Concern Worldwide and Welthungerhilfe
- (d) **None of the above**

EXPLANATION:

Recently, the hunger hotspots outlook Report 2022 was released by the Food and Agriculture Organization of the United Nations (FAO) and the World Food Programme (WFP). The report has warned that acute food insecurity is likely to deteriorate further in 19 countries or situations called hunger hotspots.

So, Option (d) is correct.



ADDITIONAL INFORMATION:

ORGANIZATIONS AND REPORTS

- World Wide Fund for Nature** ➤ It is a nonprofit organization.
- WWF works to sustain the natural world for the benefit of people and wildlife, collaborating with local and global partners in nearly 100 countries.
- WWF was established in 1961.
- WWFreleases "Living Planet Report."
- Concern Worldwide and Welthungerhilfe** ➤ Welthungerhilfe is one of Germany's largest private aid agencies, politically and religiously independent, and the organization fights for "Zero Hunger by 2030."
- It was founded in 1962.
- Global Hunger Index (GHI) report is published jointly by Welthungerhilfe and the Alliance 2015 partner Concern Worldwide.



- Food and Water watch** ➤ Food & Water Watch is a Washington, D.C.-based non-governmental organization group with an office also in Los Angeles, California
- Food& Water Watch fights for safe food, clean water, and a livable climate

Q.36) Consider the following statements :

1. Methane is the primary contributor to the formation of ground-level ozone, a hazardous air pollutant.
2. 'System of Rice Intensification(SRI)' of cultivation results in increased methane production.
3. Methane increases the amount of hydroxyl radicals available to remove other types of air pollutants.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) 1 only**

EXPLANATION

A recent assessment from the United Nations Environment Programme (UNEP) and the Climate and Clean Air Coalition found that cutting farming-related methane emissions would be key in the battle against climate change because Methane is the primary contributor to the formation of ground-level ozone, a hazardous air pollutant, and greenhouse gas, exposure to which causes 1 million premature deaths every

year. Methane is also a powerful greenhouse gas. Over 20 years, it is 80 times more potent at warming than carbon dioxide. **So, Statement 1 is correct.**

The System of Rice Intensification (SRI) is an agroecological methodology used to increase the productivity of irrigated rice by changing the management of plants, soil, water, and nutrients. Agricultural activities, including farming on inundated rice fields, release a huge amount of methane, a major greenhouse gas that is more impactful than carbon dioxide on global warming.

In fact, rice is responsible for 10% of global methane emissions and as much as 25-33% of the total methane emissions of the world's major rice producer – Southeast Asia. The continuous flooding and inundating of fields deprive the soils of oxygen, which is conducive to producing methane.

It is estimated that SRI can save at least one-third of methane emissions when flooded rice fields are drained at least once during the growing season. Thus, the effect of SRI methods is to reduce (not to increase) the net emission of Green House Gases, especially methane, from rice fields in terms of their global warming potential by 20-30%. **So, Statement 2 is not correct.**

Hydroxyl radicals are highly reactive species that attack most organic molecules. They are highly oxidizing in nature which is attributed to their oxidation potential.

When methane is emitted into the air, it reacts in several hazardous ways. For one, methane primarily leaves the atmosphere through oxidization, forming water vapor and carbon dioxide. So, not only does methane directly contribute to global warming but also indirectly through releasing carbon dioxide.

Additionally, during the oxidization process, methane reacts with hydroxyl radicals (OH). These naturally occurring molecules act as a “detergent,” cleaning methane and many other pollutants from the air. Thus, methane reduces the amount of hydroxyl radicals available to remove other types of air pollutants. **So, Statement 3 is not correct.**

Q.37) Consider the following statements :

1. In India, the phasing-out of HCFCs in all manufacturing sectors will be completed by 2025.
2. The UN adopted F- gas regulation to control emissions from fluorinated greenhouse gases, including HFCs.
3. The Kigali Amendment aims for the phase-down of hydrofluorocarbons with a goal to achieve 85% reduction in HFC consumption by 2047.

Which of the statements given above is/are correct ?

- (a) 3 only
- (b) **1 and 3 only**
- (c) 2 only
- (d) 1 and 2 only

EXPLANATION:

India, a Party to the Montreal Protocol since June 1992, has been successfully implementing the Montreal Protocol and projects and activities for phasing out of ozone-depleting substances, in line with the phase-out schedule of the Protocol.

India phased out Chlorofluorocarbons, Carbon tetrachloride, Halons, Methyl Bromide, and Methyl Chloroform for controlled uses as on 1 January 2010, in line with the Montreal Protocol schedule. Currently, Hydrochlorofluorocarbons (HCFC) are being phased out as per the accelerated schedule of the Montreal Protocol.

Hydrochlorofluorocarbons Phase-out Management Plan (HPMP) Stage - I has been successfully implemented from 2012 to 2016 and Hydrochlorofluorocarbons Phase-out Management Plan (HPMP) Stage - II is under implementation since 2017 and will be completed by 2023. Stage III of the HPMP, the last of the HPMPs to phase out remaining HCFCs, will be implemented from 2023 - 2030.

The phase-out of HCFCs in all manufacturing sectors, comprising refrigeration and air-conditioning manufacturing sectors, will be completed by 2025 and the activities relating to the servicing sector will be continued till 2030. **So, Statement 1 is correct.**

Fluorinated gases (F-Gases) are a range of synthetic refrigerants that trap heat within the atmosphere and contribute to global warming. The most common of these gasses are hydrofluorocarbons (HFCs), which are typically found on board ships in air-conditioning, refrigeration, and inert gas drying systems. They may also be found in the production of insulation foam and firefighting equipment.

The European Union adopted F- gas regulation to control emissions from fluorinated greenhouse gases (F-gases), including hydrofluorocarbons (HFCs). Due to the F-gas Regulation, the EU's F-gas emissions will be cut by two-thirds by 2030 compared to 2014 levels.

Thus, United Nations (UN) has not adopted F- gas regulation to control emissions from fluorinated greenhouse gases including HFCs. **So, Statement 2 is not correct.**

Under the Kigali Amendment, Parties to the Montreal Protocol will phase down the production and consumption of Hydrofluorocarbons, commonly known as HFCs. Hydrofluorocarbons were introduced as a non-ozone-depleting alternative to chlorofluorocarbons (CFC), such as R-12 and hydrochlorofluorocarbons (HCFC) such as R-21. While HFCs do not deplete the stratospheric ozone layer, they have a high global warming potential ranging from 12 to 14,000, which has an adverse impact on climate.

India will complete its phase-down of HFCs in 4 steps from 2032 onwards with a cumulative reduction of 10% in 2032, 20% in 2037, 30% in 2042, and 85% in 2047. All amendments and adjustments of the Montreal Protocol, prior to the Kigali Amendment have Universal support. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

MONTREAL PROTOCOL

- About**
- The Montreal Protocol on Substances that Deplete the Ozone Layer is the landmark multilateral environmental agreement that regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone-depleting substances (ODS) and adopted on 16 September 1987, the Protocol is to date one of the rare treaties to achieve universal ratification.
 - When released into the atmosphere, those chemicals damage the stratospheric ozone layer, Earth's protective shield that protects humans and the environment from harmful levels of ultraviolet radiation from the sun.
 - India became a Party to the Montreal Protocol on Substances that Deplete the Ozone Layer on 19 June 1992 and since then has ratified the amendments to the Montreal Protocol. India has successfully met the phase-out targets of all the Ozone Depleting Substances as per the Montreal Protocol Schedule
 - Under this treaty, all parties have specific responsibilities related to the phase-out of the different groups of ODS, control of ODS trade, annual reporting of data, national licensing systems to control ODS imports and exports, and other matters.
 - Developing and developed countries have equal but differentiated responsibilities, but most importantly, both groups of countries have binding, time-targeted and measurable commitments.



Q.38) Consider the following statements :

1. Ocean acidification is an increase in the pH of the ocean, as carbonic acid increases due to the dissolving of carbon dioxide.
2. Ocean Acidification is referred to as the 'Evil Twin' of Global Warming.
3. The IAEA's Ocean Acidification International Coordination Centre (OA-ICC) promotes international collaboration on ocean acidification.

Which of the statements given above is/are correct ?

- (a) 1 and 3 only
- (b) 1 only
- (c) **2 and 3 only**
- (d) 2 only

EXPLANATION:

Ocean acidification refers to a reduction in the pH of the ocean over an extended period of time, caused primarily by the uptake of carbon dioxide (CO₂) from the atmosphere.

Because of human-driven increased levels of carbon dioxide in the atmosphere, there is more CO₂ dissolving into the ocean. The ocean's average pH is now around 8.1 which is basic (or alkaline), but as the ocean continues to absorb more CO₂, the pH decreases and the ocean becomes more acidic.

Water and carbon dioxide combine to form carbonic acid (H₂CO₃), a weak acid that breaks (or "dissociates") into hydrogen ions (H⁺) and bicarbonate ions (HCO₃⁻). This carbonic acid level increases as more dissolution of carbon dioxide happen in oceans, which in turn reduces the pH value of the ocean. **So, Statement 1 is not correct.**

Ocean acidification is often called the "evil twin" of climate change due to its harmful consequence of absorbing excess carbon dioxide in the atmosphere, which is happening underwater. Because of the amount of CO₂ absorbed by the oceans, this increase in emissions is changing the ocean's acidity.

At least one-quarter of the carbon dioxide (CO₂) released by burning coal, oil, and gas doesn't stay in the air but instead dissolves into the ocean. Since the beginning of the industrial era, the ocean has absorbed some 525 billion tons of CO₂ from the atmosphere, presently around 22 million tons per day. **So, Statement 2 is correct.**

The IAEA, in line with its 'Atoms for Peace and Development' mandate, supports countries in their efforts to reach the 17 Sustainable Development Goals (SDGs) set out in the United Nations (UN) 2030 Agenda for Sustainable Development. Many countries use nuclear science and technology to contribute to and meet their development objectives in areas including energy, human health, food production, water management and environmental protection.

To deal with the issue of Ocean acidification, The International Atomic Energy Agency (IAEA) has established Ocean Acidification International Coordination Centre (OA-ICC) to promote international collaboration to reduce this menace. The OA-ICC organizes training courses in Member States and provides access to data and resources to advance ocean acidification research. The Centre promotes the

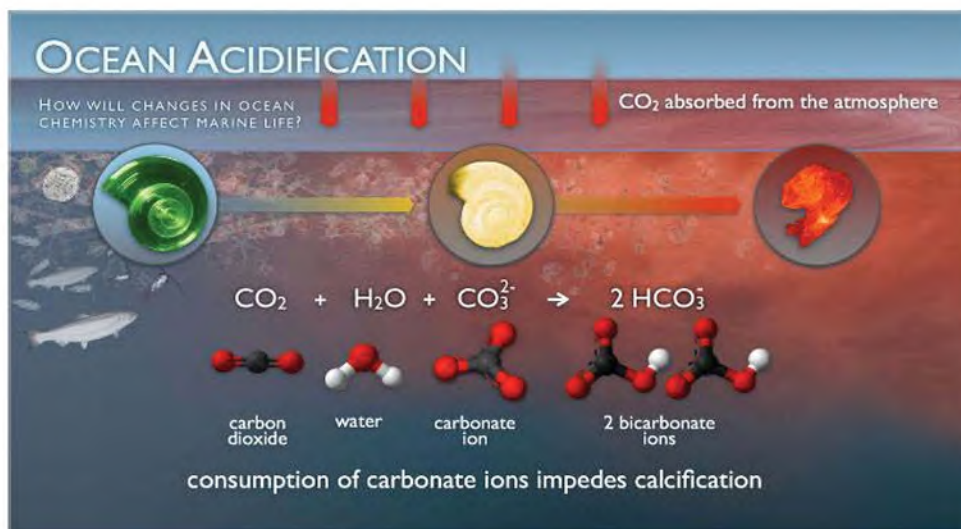
development of data portals, standardized methodology, and best practices.

The OA-ICC works to raise awareness of the issue among various stakeholders and inform them about the role that nuclear and isotopic techniques can play in assessing its impacts. To achieve these objectives, the OA-ICC works with many international partners and supports global and regional ocean acidification networks, including the Global Ocean Acidification Observing Network. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

OCEAN ACIDIFICATION

- Impacts**
- Ocean acidification is already impacting many ocean species, especially organisms like oysters and corals that make hard shells and skeletons by combining calcium and carbonate from seawater.
 - However, as ocean acidification increases, available carbonate ions (CO_3^{2-}) bond with excess hydrogen, resulting in fewer carbonate ions available for calcifying organisms to build and maintain their shells, skeletons, and other calcium carbonate structures. If the pH gets too low, shells and skeletons can even begin to dissolve.
 - The changes in ocean chemistry can affect the behavior of non-calcifying organisms as well. Certain fish's ability to detect predators is decreased in more acidic waters. When these organisms are at risk, the entire food web may also be at risk.
 - Ocean acidification is affecting the entire world's oceans, including coastal estuaries and waterways. Many economies are dependent on fish and shellfish and people worldwide rely on food from the ocean as their primary source of protein.



Q.39) Consider the following statements :

1. UNESCO's International Geoscience Programme facilitates international scientific cooperation in geosciences.
2. Mawmluh Cave (KremMawmluh), in Assam, is listed as one of the 'First 100 International Union of Geological Sciences Geological Sites' in the world.
3. UNESCO is the only United Nations organization with a mandate to support research and capacity in geology and geophysics.

Which of the statements given above is/are correct ?

- (a) 2 only
- (b) 3 only

(c) 1 and 3 only

(d) 1,2 and 3

EXPLANATION:

The International Geoscience Programme mission includes promoting the sustainable use of natural resources and advancing new geo-diversity and geo-heritage and geohazards risk mitigation initiatives.

The International Geoscience Programme (IGCP) serves as a knowledge hub of UNESCO (the United Nations Educational, Scientific and Cultural Organization) to facilitate international scientific cooperation in the geosciences. **So, Statement 1 is correct.**

Recently, Mawmluh Cave in Meghalaya, locally known as Krem Mawmluh, is the fourth longest cave in India, with a total length of 7 km of cave passages. It has been listed as UNESCO's one of the 'First 100 IUGS (International Union of Geological Sciences) Geological Sites' in the world. **So, Statement 2 is not correct.**

The United Nations Educational, Scientific and Cultural Organization (UNESCO) 's mission is to contribute to building a culture of peace, the eradication of poverty, sustainable development and intercultural dialogue through education, the sciences, culture, communication and information.

The United Nations Educational, Scientific and Cultural Organization is the only United Nations organization with a mandate to support research and capacity in geology and geophysics. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

INTERNATIONAL GEOSCIENCE PROGRAMME

- Mawmluh Cave**
- Mawmluh Cave in Meghalaya has been chosen as the first 100 geological heritage site.
 - Lt. Yule, a Britishman, discovered the cave in 1844.
 - It is a part of the system of caves in Meghalaya, which includes caves in the districts of Jaintia, Khasi Hills, and Garo Hills.
 - The word "krem" in the local Khasi language means cave.
 - Therria sandstone, thick dolomite, and Sylhet limestone are the layers that make up this intricate sub-horizontal network of passages.
 - The cave, which is 7.2 kilometres long, has numerous entrances.
 - It is known for stunning stalactite and stalagmite formations.



- About** ➤ IUGS was established in 1961.
- International** ➤ It has 121 members.
- Geoscience** ➤ The International Geoscience Programme promotes collaborative projects with a special emphasis on the benefit to society, capacity-building, and the advancement and sharing of knowledge between scientists, emphasizing North-South and South-South cooperation.
- Programme** ➤ Internationally important geological sites are listed by the IUGS, including those with tectonic, sedimentological, petrological, mineralogical, hydrogeological, paleontological, geomorphological, and history of geological sciences connections.
- Geohazards** ➤ Geohazards are natural events that occur on Earth, such as earthquakes, tsunamis, volcanic eruptions, and storms.
- When Geohazards impact humans, they may be vulnerable, and this vulnerability makes the Risk

Q.40) Consider the following statements with reference to the effects of climate change on land :

1. Climate change can convert land areas from one biome to another.
2. Agriculture, forestry and other land use results in both emissions and removals of CO₂, CH₄ and N₂O to and from the atmosphere.
3. The decrease in the emissions of biogenic volatile organic compounds resulted in a negative radiative forcing.
4. Communication between phytophagous insect pests and their host plants would be affected.

Which of the statements given above is/are correct ?

- (a) 1, 2 and 3 only
- (b) 2 and 3 only
- (c) **1, 2 and 4 only**
- (d) 1, 2, 3 and 4

EXPLANATION:

Climate change could convert whole land areas from one biome to another, alter global biogeochemical cycles and isolate a myriad of species to extinction. Forests, tundra's, and alpine areas are some of the

world's most at-risk ecosystems for climate change.

So, Statement 1 is correct.

Agriculture, forestry and other land use (AFOLU) is a significant net source of Green House Gas (GHG) emissions, contributing to about 23% of anthropogenic emissions of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) combined as CO₂ equivalents in 2007–2016.

The CO₂ and other non-CO₂ greenhouse gases (GHG), largely methane (CH₄) and nitrous oxide (N₂O), are in turn released to the atmosphere by plant respiration, by decomposition of dead plant biomass and soil organic matter, and by combustion.

Nitrous oxide is removed from the atmosphere when it is absorbed by certain bacteria or destroyed by ultraviolet radiation or chemical reactions. The main mechanism for removing methane from the earth's atmosphere is oxidation within the troposphere by the hydroxyl radical (OH). A hydroxyl radical is a negatively charged oxygen atom bonded to a hydrogen atom (OH).

AFOLU activities lead to both sources of CO₂ (e.g., deforestation, peatland drainage) and sinks of CO₂ (e.g., afforestation, management for soil carbon sequestration) and to non-CO₂ emissions primarily from agriculture (e.g., CH₄ from livestock and rice cultivation, N₂O from manure storage and agricultural soils and biomass burning). Thus, AFOLU activities result in emissions of CO₂, Methane (CH₄) and NO₂ to the atmosphere and the removal of these gases from the atmosphere. **So, Statement 2 is correct.**

The earth absorbs energy in the form of ultraviolet, visible and infrared radiation from the sun and emits infrared radiation to outer space. These two processes are always in balance. Certain atmospheric trace gases, the radiatively-active trace gases like CO₂, Methane, etc., absorb some of the outgoing infrared radiation and disturb this radiative balance. The earth's surface and atmosphere react to this disturbance by warming, re-establishing the radiative balance. This process is called radiative forcing, and the warming is the greenhouse effect.

All plants emit a wide range of volatile compounds such as nitric oxide, carbon monoxide, and non-methane volatile organic compounds, the so-called biogenic volatile organic compounds (BVOC).

BVOCs have an important, negative impact on the atmosphere because they play a major role in the production of tropospheric ozone and aerosols. BVOCs rapidly react with anthropogenic and natural compounds, particularly nitrogen oxides, in the atmosphere, forming tropospheric ozone and photochemical smog. Furthermore, BVOCs affect the residence time of other greenhouse gases (including methane) and may cause the formation of secondary aerosols, a component of PM₁₀, in the atmosphere.

Biogenic volatile organic compounds mediate the relationship between the biosphere and the atmosphere. Alteration of this relationship by anthropogenically driven environmental changes, including global climate change, may perturb these interactions and lead to adverse and hard-to-predict consequences for the Earth system. Thus, It results in positive radiative forcing, in which the earth holds more energy (heat) than it releases to space. In contrast, negative radiative force leads to the cooling of the earth. **So, Statement 3 is not correct.**

Insects depend highly on odor cues released into the environment to locate conspecifics or food sources. This mechanism is particularly important for insect predators that rely on kairomones released by their prey to detect them. In the context of climate change and, more specifically, modifications in the gas composition of the atmosphere, chemical communication-mediating interactions between phytophagous insect pests, their host plants, and their natural enemies are likely to be impacted. **So, Statement 4 is correct.**

ADDITIONAL INFORMATION:

CLIMATE CHANGE

- About** ➤ Climate change refers to long-term shifts in temperatures and weather patterns.

- These shifts may be natural, such as through variations in the solar cycle.
- Fossil fuels – coal, oil and gas – are by far the largest contributor to global climate change, accounting for over 75 percent of global greenhouse gas emissions and nearly 90 percent of all carbon dioxide emissions.
- As greenhouse gas emissions blanket the Earth, they trap the sun’s heat, which leads to global warming and climate change.

Effects of Climate Change

- Rising temperatures and shifting precipitation patterns are changing the geographic areas where mammals, birds, insects, and plants that live on land can survive—and are affecting the timing of lifecycle events, such as bud bursts, leaf drops from trees, pollination, reproduction, and bird migration.
- Climate change will affect soils, leading to changes in soil erosion, organic carbon, nutrients and alkalinity.
- Decreasing soil carbon due to climate change also has implications for accounting for carbon emissions from the land.

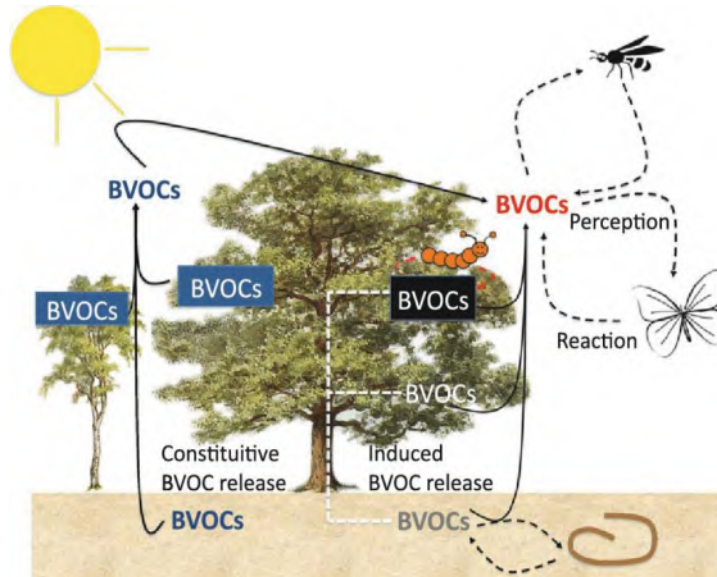
Phytophagous Insects

- Phytophagous insects are generally considered to be those that feed on green plants.
- They include species that attack roots, stems, leaves, flowers, and fruits, either as larvae or as adults or in both stages.



BVOC

- Biogenic volatile organic compounds (BVOCs) are low boiling point compounds commonly synthesized by secondary metabolic pathways in plants. Many vascular plants can discharge BVOCs into the atmosphere.
- They are produced by plants and are involved in plant growth, development, reproduction and defense.
- They also function as communication media within plant communities, between plants and between plants and insects.



Q.41) Consider the following statements with reference to UNFCCC's Sustainable Development Mechanism(SDM) :

1. SDM supports the implementation of the Clean Development Mechanism (CDM), Joint Implementation and International Emissions Trading.
2. The SDM is an offsetting tool in complement to the mechanisms established under the Kyoto Protocol.
3. SDM manages the Non-State Actor Zone for Climate Action platform and supports the COP Presidencies' Climate Action Champions.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) **1 and 3 only**
- (d) 1, 2 and 3

EXPLANATION:

The Sustainable Development Mechanisms (SDM) programme is leading in the development and effective implementation of innovative approaches to broaden the effectiveness of action to mitigate climate change and drive sustainable development. SDM supports the operationalization of the cooperative approaches established by Article 6 of the Paris Agreement and broader efforts to engage non-Party stakeholders in climate action.

SDM manages the NAZCA (Non-State Actor Zone for Climate Action) platform, supports the COP Presidencies' Climate Action Champions and supports the implementation of the three Kyoto mechanisms- the Clean Development Mechanism (CDM), Joint Implementation (JI), and International Emissions Trading (IET). **So, Statements 1 and 3 are correct.**

Under the Kyoto Protocol in 1996, Clean Development Mechanism was established as a pure offsetting mechanism. The term offset means when developing countries' reductions in emissions produce credits that could offset increased emissions in developed countries but still meet their climate targets.

Whereas Sustainable Development Mechanism (SDM), established by the 2015 Paris Agreement, was not used as an offsetting mechanism. SDM has the specific goal to 'deliver an overall mitigation in global emissions,' meaning that using the SDM must lead to emissions reductions. Given the overall Paris framework and objectives, it becomes clear that offsetting is not an appropriate tool for the climate change

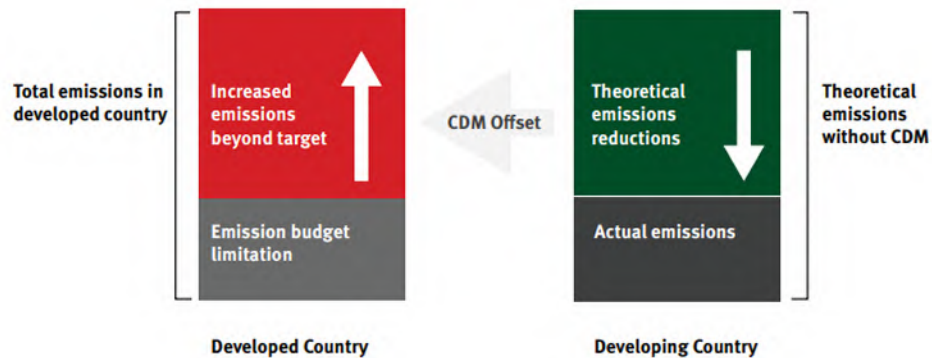
challenge. Therefore, in contrast to the mechanisms established under the Kyoto Protocol, the SDM cannot be an offsetting tool. **So, Statement 2 is not correct.**

ADDITIONAL INFORMATION:

SUSTAINABLE DEVELOPMENT MECHANISM(SDM)

- About**
- SDM is a centralized mechanism governed by the United Nations and overseen by a new Supervisory Body.
 - Article 6 of the Paris Agreement established the Sustainable Development Mechanism (SDM) as a new carbon market instrument for the period after 2020.
 - Its purpose is to replace the existing mechanisms under the Kyoto Protocol, the Clean Development Mechanism, with a more effective climate tool.
 - SDM allows private companies or countries to trade emissions reductions.
 - The mechanism can generate carbon credits from specific emissions “avoidance” or “removal” activities in the host country—such as building wind farms, installing low-carbon heating, or planting forests—to count toward another country’s climate targets.

Offsetting: No Overall Reduction



Q.42) Consider the following statements :

1. UNFCCC’s COP 27 decides to establish the Advisory Board of the Santiago network as part of the Warsaw International Mechanism.
2. Warsaw International Mechanism associated with the Programme on the Action for Climate Empowerment.
3. At COP 27, the G7 and the V20 launched the Global Shield against Climate Risks, with new commitments of over USD 200 million as initial funding.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) **1 and 3 only**
- (d) 1,2 and 3

EXPLANATION:

United Nations Framework Convention on Climate Change (UNFCCC) COP 27 decided to establish the Advisory Board of the Santiago Network as part of the Warsaw International Mechanism (WIM), which will be under the authority and guidance of appropriate governing bodies, and have the roles and responsibilities outlined in the terms of reference.

An Advisory Board to provide guidance and oversight to the Santiago network secretariat on the effective implementation of the functions of the network.

So, Statement 1 is correct.

The Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts, which will be under the authority and guidance of and accountable to the appropriate governing body or bodies.

The Glasgow work Programme on Action for Climate Empowerment (ACE), which was approved at COP26, a framework that will guide national work on ACE. Action for Climate Empowerment (ACE) is a term adopted by the UN Framework Convention on Climate Change to denote work under Article 6 of the Convention and Article 12 of the Paris Agreement. Thus, the Programme on the Action for Climate Empowerment is not associated with Warsaw International Mechanism. **So, Statement 2 is not correct.**

One of the important announcements from COP27 is that the G7 (Global 7) and the V20 (the Vulnerable Twenty) launched the Global Shield against Climate Risks, with new commitments of over USD 200 million as initial funding. Implementation is to start immediately. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

UNFCCC's COP 27

- Action for Climate Empowerment (ACE)**
 - The over-arching goal of ACE is to empower all members of society to engage in climate action, through the six ACE elements.
 - Implementation of all six ACE elements is crucial to the global response to climate change. Everyone, including and perhaps especially the young, must understand and participate in the transition to a low-emission, climate-resilient world.
 - The guidelines were developed as a joint initiative between the UNFCCC and UNESCO. They were launched at COP 22 in Marrakech, Morocco.



- Warsaw International Mechanism**
 - The Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts, including extreme events and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change at COP19 (November 2013) in Warsaw, Poland.
- G7 Countries**
 - The Group of Seven consists of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States of America. The European Union also participates in G7 meetings.
- V20 Countries**
 - Formed in 2015, the Vulnerable 20 Group of Finance Ministers is a dedicated cooperation of economies systematically vulnerable to climate change. Currently chaired by the Republic of Ghana, V20 Group members are also states of the Climate Vulnerable Forum (CVF).
 - The V20 membership stands at 58 economies representing some 1.5 billion people, including Afghanistan, Bangladesh, Barbados, Benin, Bhutan, Burkina Faso,

Cambodia, Chad, Colombia, Comoros, Costa Rica, Côte d'Ivoire, Democratic Republic of the Congo, Dominican Republic, Eswatini, Ethiopia, Fiji, The Gambia, Ghana, Grenada, Guatemala, Guinea, Guyana, Haiti, Honduras, Kenya, Kiribati, Kyrgyzstan, Lebanon, Liberia, Madagascar, Malawi, Maldives, Marshall Islands, Mongolia, Morocco, Nepal, Nicaragua, Niger, Palau, Palestine (as a UN non-member observer state), Papua New Guinea, Philippines, Rwanda, Saint Lucia, Samoa, Senegal, South Sudan, Sri Lanka, Sudan, Tanzania, Timor-Leste, Tunisia, Tuvalu, Uganda, Vanuatu, Vietnam and Yemen.

Q.43) Consider the following statements :

1. *Trametes maxima* IIPLC-32 is a bacteria capable of removing toxic and carcinogenic polycyclic aromatic hydrocarbons (PAHs) from the environment.
2. It was identified by the CSIR-Indian Institute of Petroleum, Dehradun.
3. Pyrene belongs to the highly toxic class of PAHs, with carcinogenic and mutagenic properties.
4. Pyrene is used to make dyes, plastics and pesticides.

Which of the statements given below is/are correct ?

- (a) 1,3 and 4 only
- (b) **2,3 and 4 only**
- (c) 1 and 3 only
- (d) 1 and 4 only

EXPLANATION:

Recently, researchers at the Council of Scientific and Industrial Research-Indian Institute of Petroleum (CSIR) at Dehradun have identified a fungus capable of removing toxic, recalcitrant (Not easily controlled), carcinogenic Pyrene or Polycyclic Aromatic Hydrocarbons (PAHs) from the environment.

Trametes maxima IIPLC-32, a white-rot fungus, not bacteria, which has the potential to cause microbial degradation of pyrene, which grows on dead plants *Trametes maxima* IIPLC-32, which has the potential to cause microbial degradation of pyrene. **So, Statement 1 is not correct, and Statement 2 is correct.**

The Polycyclic aromatic hydrocarbons (PAHs) are ubiquitous (Present everywhere) environmental pollutants originating from multiple sources, including the combustion of petrogenic fossil fuels and incomplete incineration of municipal wastes and biomass.

Pyrene belongs to the highly toxic class of PAHs, with carcinogenic and mutagenic properties, and it possesses four benzene rings. It gets lodged into the environmental matrices like soil, water and atmosphere, resulting in widespread environmental pollution, necessitating adequate remediation of contaminated environmental matrices.

Pyrene and its derivatives are used commercially to make dyes, for example, pyranine, pesticides, pharmaceuticals, and plastics. **So, Statements 3 and 4 are correct.**

Q.44) Consider the following statements :

1. Green Gigaton Challenge is a global initiative by Emergent and the UN Environment, supported by the Environmental Defense Fund.
2. Green Gigaton Challenge brings together a coalition of public, private and philanthropic partners to channelise funds for REDD+.

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

EXPLANATION:

Green Gigaton Challenge is a global initiative by Emergent and the UN-REDD Programme, supported by the Environmental Defense Fund, Forest Trends and the Architecture for REDD+ Transactions - to catalyze funding for one gigaton of high-quality emissions reductions a year from forests by 2025.

The Green Gigaton Challenge aims to break the stalemate on the contribution from forests to close the emission gap by 2030 and ensure biodiversity conservation and a green recovery from Covid-19.

Achieving one gigaton a year of emission reduction will significantly contribute to keeping global warming below 2°C and do so in a cost-effective way. Ultimately, the Challenge offers a concrete framework to leverage public and private finance for large-scale, high-quality forest protection and restoration.

So, Statement 1 is not correct.

Green Gigaton Challenge brings together a coalition of public, private and philanthropic partners to channel funds into efforts led by national and subnational governments to reduce emissions from deforestation and forest degradation (REDD+).

So, Statement 2 is correct.

ADDITIONAL INFORMATION:

GREEN GIGATON CHALLENGE

- About**
- It is a global effort that seeks to catalyze funds to transact one gigaton of high-quality emissions reductions from forest-based natural climate solutions by 2025.
 - A gigaton is 1,000,000,000 tonnes and is often used when discussing human carbon dioxide emissions.
 - Through utilizing donor-funded floor prices for results-based payments and facilitating and leveraging private sector demand above these floor prices, the Green Gigaton Challenge will support forest countries to achieve their Nationally Determined Contributions (NDC) and increase ambition.
 - At the same time, helping companies complement their internal emissions reductions with high-quality carbon credits.

- UN-REDD**
- UN-REDD (reducing emissions from deforestation and forest degradation) is the flagship United Nations knowledge and advisory partnership on forests and climate to reduce forest emissions and enhance forest carbon stocks.
 - It is the largest international provider of REDD+ assistance, supporting its 65 partner countries to protect their forests and achieve their climate and sustainable development goals.

- REDD+**
- REDD+ is a climate change mitigation solution developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC).
 - REDD+ goes beyond simply deforestation and forest degradation and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

Q.45) Consider the following statements :

1. The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) is a multilateral facility that promotes and rewards reduced greenhouse gas emissions.
2. BioCF Tranche 3, an arm of the International Monetary Fund, provides results-based finance through the purchase of verified emissions reductions.

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

EXPLANATION:

The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) is a multilateral facility that promotes and rewards reduced greenhouse gas emissions and increased sequestration through better land management, including REDD+ (Reduced Emissions from Deforestation and forest Degradation), climate smart agriculture, and smarter land use planning and policies. The ISFL will pilot programs and interventions at a jurisdictional scale in order to test approaches and share lessons learned broadly.

This Initiative was established in 2013 and is supported by Germany, the Kingdom of Norway, Switzerland, the United Kingdom, and the United States.

So, Statement 1 is correct.

The ISFL has two key funding instruments, the BioCFplus and BioCF Tranche 3 (T3), which have been designed specifically to operationalize the vision of the ISFL. BioCF Tranche 3 provides results-based payments for verified emission reductions through an Emission Reductions Purchase Agreement (ERPA). The ISFL is supported by donor governments and managed by the World Bank.

So, Statement 2 is not correct.

ADDITIONAL INFORMATION:

BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL)

Starting year	2013
End year	2030
Secretariat	World Bank (Global Climate Change Fund Management Unit) - Roy Parizat (Fund Manager)
Organisational structure	The BioCarbon Fund ISFL is a multilateral facility, supported by donor governments and managed by the World Bank.
Geographical coverage	Global, Asia and the Pacific, Latin America and The Caribbean, Africa
Name of lead organisation	World Bank
Location of lead organisation	United States of America
Objective	The ISFL aims to catalyze the development of a low-carbon rural economy in each of its program areas that will simultaneously result in livelihood opportunities for communities and an overall reduction in emissions from the land.
BioCFplus	<ul style="list-style-type: none">➤ Provides funding in the form of a grant.➤ Supports countries to make improvements to its enabling environment for sustainable land use.➤ Supports piloting of activities and key partnerships, including engagements with private sector.➤ Provides resources to countries to develop systems for monitoring, reporting, and verifying reductions in GHG emissions to prepare jurisdictions for payments.
BioCF Tranche 3	<ul style="list-style-type: none">➤ Provides results-based finance through the purchase of verified emissions reductions.➤ Payments provide incentives for countries to shift to a sustainable development trajectory for each jurisdiction.➤ Payments can be used to sustain successful interventions to sustainable land use in each jurisdiction.

Q.46) Biological Diversity (Amendment) Bill, 2021 sometimes seen in the news recently, seeks to amend the Biological Diversity Act, 2002 to :

1. Encourage the Indian system of medicine and cultivation of wild medicinal plants
2. Facilitate fast-tracking of processes for research, patent application, and transfer of research results
3. Criminalize offenses under the act
4. Encourage foreign investment in the sector
5. Include references to the Nagoya Protocol

Select the correct answer from the codes given below :

(a) 1, 3 and 4 only

(b) 2, 3 and 5 only

(c) 1, 2, 4 and 5 only

(d) 1, 2, 3, 4 and 5

EXPLANATION:

Biodiversity refers to variabilities among plants, animals and microorganism species. Biodiversity includes the number of different plants, animals and microorganisms, their genes, and the terrestrial, marine and freshwater ecosystems they are part of. It also reflects the organization of organisms at different levels.

The Biological Diversity (Amendment) Bill 2021 amends the Biological Diversity Act 2002, which provides for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising from the use of biological resources.

Biological Diversity (Amendment) Bill 2021 seeks to amend the Biological Diversity Act, 2002 to:

- Encourage the Indian system of medicine and cultivation of wild medicinal plants,
- Facilitate fast-tracking of processes for research, patent application, and transfer of research results,
- Decriminalise offences under the Biological Diversity Act 2002. Hence, it does not criminalize offenses.
- Encourage foreign investment in the sector.
- The Bill also amends the Act to include references to the Nagoya Protocol.

So, Option(c) is correct.

ADDITIONAL INFORMATION:

BIOLOGICAL DIVERSITY (AMENDMENT) BILL, 2021

The Biological Diversity Act, 2002	Changes made by the Bill
<p>Approval required from NBA (for certain foreign entities)</p> <ul style="list-style-type: none"> Entities: (i) foreign individuals, (ii) non-resident Indians, (iii) companies not registered in India, and (iv) companies registered in India and having non-Indian participation in share capital or management Activities: obtaining biological resources occurring in India or associated knowledge for: (i) research, (ii) commercial utilisation, or (iii) bio-survey and bio-utilisation <p>Prior intimation required to SBB (for certain domestic entities)</p> <ul style="list-style-type: none"> Entities: (i) Indian citizens, and (ii) companies registered in India except those which require NBA approval Activities: obtaining biological resources occurring in India for commercial utilisation Exemptions: use by local people and communities including growers and cultivators of biodiversity, and vaidas and hakims practising indigenous medicine 	<p>Approval from NBA</p> <ul style="list-style-type: none"> Entities: changes the last category to companies registered in India which are “foreign-controlled” companies as under the Companies Act, 2013 <p>Prior intimation to SBB</p> <ul style="list-style-type: none"> Activities: access to associated knowledge for commercial utilisation will also require prior intimation Exemptions: adds exemptions for: (i) codified traditional knowledge, (ii) cultivated medicinal plants and their products, (iii) AYUSH practitioners; limits the exception to vaidas and hakims, and AYUSH practitioners to use for sustenance and livelihood

National Biodiversity Authority

- It is a statutory body established under Section 8 of the Act for the implementation of the provisions of the Biological Diversity Act, 2002 (BD Act, 2002).
- It facilitates and regulates the activities on the access of biological resources, associated knowledge, sharing of benefits arising from the use of biological resources, publication of Internationally Recognized Certificate of Compliance (IRCC) and provides technical support to States for notifying the Biodiversity Heritage Sites.

Biological Diversity Act, 2002

The Biological Diversity Act 2002 was framed to give effect to the United Nations Convention on Biological Diversity (CBD), 1992, which strives for sustainable, fair and equitable sharing of benefits from utilizing biological resources and associated traditional knowledge.

Biological Diversity Act, 2002

Biological Diversity Act, 2002 formulates a three-tier structure consisting of:

National Biodiversity Authority (NBA)-National level,
State Biodiversity Boards (SBBs)-State level and
Biodiversity Management Committees (BMCs)- Local body

Q.47) ‘Aashwasan Campaign’ recently seen in the media related to which one of the following?

(a) **It is a door-to-door screening for TB under Tribal TB Initiative.**

(b) Campaign where participants came together for a fit (Swasth) and litter-free (Swachhta) India under fit India.

- (c) It is an awareness and protection drive around the world to protect big cats by encouraging people not to purchase illegal wildlife products.
- (d) It is a global campaign to influence the formulation and implementation of policies leading to Universal Public Health Coverage.

EXPLANATION:

The National Tribal Research Institute (NTRI), New Delhi recently disseminated the learnings of the 100-day Aashwasan Campaign under the 'Tribal Tuberculosis (TB) Initiative'. Tribal TB Initiative is a joint initiative of the Ministry of Tribal Affairs and Central TB Division, Ministry of Health, supported by USAID (United States Agency for International Development) as a technical partner and Piramal Swasthya as implementing partner.

The Aashwasan Campaign was started in January this year for active case finding for TB in 174 tribal districts of India, under the ambit of the Tribal TB Initiative. It was flagged off in Nandurbar District, Maharashtra. Under the initiative, door-to-door screening for TB was undertaken covering 68,019 villages. Based on the verbal screening of 1,03,07,200 persons, 3,82,811 people were identified for Presumptive TB. Of these, 2,79,329 (73%) samples were tested for TB and 9,971 people were found to be positive for TB and put on treatment as per Government of India protocols. **So, Option (a) is correct.**

Fit India Mission in its endeavour to promote fitness and create awareness amongst countrymen keeps coming up with innovative fitness campaigns to indulge people in fitness activities. Fit India Mission converges with Swachh Bharat Abhiyan with Fit India Plog Run where fitness meets Swachhhta in a form of engaging fun-loving exercise is now entailed in Fit India Freedom Run culminating where we discover litter-free clean surroundings while running. **So, Option (b) is not correct.**

The Wild for Life Big Cat Team Challenge helped drive awareness and protection around the world's remaining jaguars, lions, snow leopards, and tigers, by encouraging people not to purchase illegal wildlife products. By taking part, we can help to ensure that these precious cats have our attention and our protection. **So, Option (c) is not correct.**

My Right to Health campaign is the global campaign to influence the formulation and implementation of policies leading to Universal Public Health Coverage (UPHC). It will provide information about the right to health and what impact it has on people's lives. It will also aim to increase the visibility around the need to achieve the full realization of the right to health by everyone, everywhere. **So, Option (d) is not correct.**

Q.48) Consider the following statements with reference to the Cartagena Protocol :

1. India is a signatory to the Protocol but ratified it very recently.
2. Each party to the Protocol is required to protect confidential information received under the Protocol.
3. It does not address the obligations of Parties in relation to the transboundary movements of living modified organisms to and from non-Parties to the Protocol.
4. It covers living modified organisms that are pharmaceuticals for humans, even if they are covered by other international agreements.

How many statements given above is/are correct?

- (a) Only one statement
- (b) Only two statements
- (c) Only three statements
- (d) All four statements

EXPLANATION:

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international treaty governing the movements of living modified organisms (LMOs) resulting from modern biotechnology from one country to another.

The Cartagena Protocol was adopted in 2000 and entered into force in 2003.

India is a signatory to the Cartagena Protocol on Biosafety (2001) and ratified it in 2003.

Therefore, India has not ratified it very recently. **So, Statement 1 is not correct.**

Each Party in the Cartagena Protocol shall protect confidential information received, and any confidential information received in the context of the advance informed agreement procedure of the Protocol is also protected.

It should also be noted that once information is made available to the Bio safety Clearing-House (BCH) under Article 20 and other provisions of the Protocol, it will not be considered confidential as the objective is to make this information publicly available. **So, Statement 2 is correct.**

The Protocol addresses Parties' obligations in relation to the transboundary movements of living modified organisms to and from non-Parties to the Protocol.

The transboundary movements between Parties and non-Parties must be carried out consistent with the Protocol's objective. **So, Statement 3 is not correct.**

The scope of the Protocol does not cover the Living modified organisms that are pharmaceuticals for humans if other international agreements or arrangements cover them.

The Protocol applies to the transboundary movement, transit, handling and use of all living modified organisms that may have adverse effects on the conservation and sustainable use of biological diversity, taking into account risks to human health.

So, Statement 4 is not correct.

ADDITIONAL INFORMATION:

CARTAGENA PROTOCOL

- About**
- It was adopted in 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force in 2003.
 - In 2000, the Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety.
 - The Protocol seeks to protect biological diversity from the potential risks of living-modified organisms resulting from modern biotechnology.
- Living Modified Organism (LMO)**
- A Living Modified Organism (LMO) is defined in the Cartagena Protocol on Biosafety as any living organism that possesses a novel combination of genetic material obtained through modern biotechnology.
 - The Protocol defines the terms 'living organism' and 'modern biotechnology.'
 - Common LMOs include genetically modified crops for greater productivity or resistance to pests or diseases. Examples of modified crops include tomatoes, cassava, corn, cotton and soybeans.
- Advance Informed Agreement**
- The Cartagena Protocol on Biosafety establishes an Advance Informed Agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to import such organisms into their territory.
 - The "Advance Informed Agreement" (AIA) procedure applies to the first intentional transboundary movement of LMOs for intentional introduction into the environment of the Party of import.
- Purpose of** This procedure aims to ensure that importing countries have both the opportunity and the

Advance Informed Agreement capacity to assess risks associated with the LMO before agreeing to its import.

- Biosafety Clearing House**
- The Protocol establishes a Biosafety Clearing-House for Parties to exchange information and contains several important provisions, including capacity-building, financial mechanisms, compliance procedures and public awareness and participation.
 - The Protocol established a Biosafety Clearing-House (BCH) as part of the clearing-house mechanism of the Convention on Biological Diversity to facilitate the exchange of scientific, technical, environmental and legal information on, and experience with, living modified organisms; and to assist Parties to implement the Protocol.

Q.49) Consider the following statements with reference to the post-2020 global biodiversity framework:

1. The framework has 21 targets for 2030 to preserve and protect nature and its essential services to people.
2. The framework has 4 long-term goals to be attained by 2050.
3. It aims to prevent or reduce the rate of introduction and establishment of invasive alien species by 50%.
4. The framework is legally binding in nature.

How many statements given above is/are correct ?

- (a) Only one statement
- (b) Only two statements
- (c) Only three statements**
- (d) All four statements

EXPLANATION:

The Post-2020 global biodiversity framework builds on the Strategic Plan for Biodiversity 2011-2020. It sets out an ambitious plan to implement broad-based action to transform society's relationship with biodiversity, ensuring that by 2050 the shared vision of 'living in harmony with nature is fulfilled.

The UN Convention on Biological Diversity (CBD) Secretariat has officially drafted a new Global Biodiversity Framework to guide actions worldwide through 2030 to preserve and protect nature and its essential services to people.

The Post-2020 global biodiversity framework has 21 action-oriented targets to be achieved by 2030 to reach the 4 long-term goals for 2050 related to the 2050 Vision for Biodiversity. **So, Statements 1 and 2 are correct.**

The post-2020 global biodiversity framework aims to eliminate or reduce the impacts caused by invasive alien species on native biodiversity by managing pathways for the introduction of alien species, preventing the introduction and establishment of all priority invasive species, reducing the rate of introduction of other known or potentially invasive species by at least 50 percent and eradicating or controlling invasive alien species.

So, Statement 3 is correct.

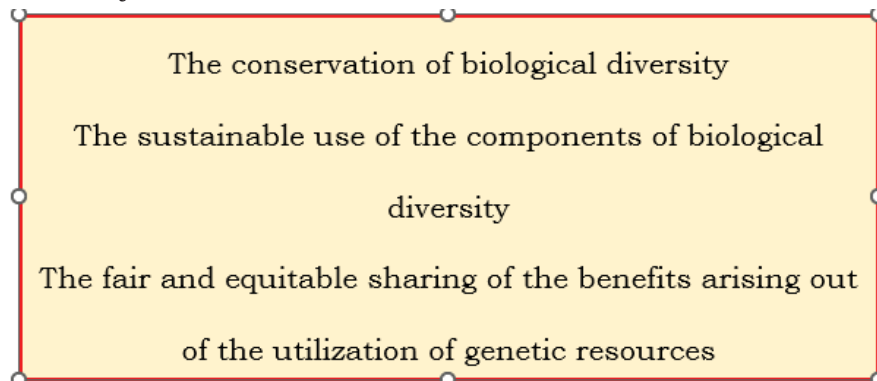
The Convention on Biological Diversity (CBD) is an international legally-binding treaty.

The Post-2020 global biodiversity framework has been drafted as goals and targets by the Convention on Biological Diversity (CBD), and therefore, the framework is not itself legally binding in nature. **So, Statement 4 is not correct.**

ADDITIONAL INFORMATION:

THE POST-2020 GLOBAL BIODIVERSITY FRAMEWORK

- About**
- The post-2020 framework includes the next set of global goals and targets for biodiversity.
 - The framework includes a long-term vision of "living in harmony with nature."
 - The Framework comprises 21 targets and 10 'milestones' proposed for 2030, en route to 'living in harmony with nature by 2050.
- Key Targets**
- Ensure that at least 30 percent globally of land areas and sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.
 - Reduce nutrients lost to the environment by at least half, pesticides by at least two-thirds, and eliminate the plastic waste discharge.
 - Redirect, repurpose, reform or eliminate incentives harmful to biodiversity in a just and equitable way, reducing them by at least \$500 billion annually.
 - Use ecosystem-based approaches to contribute to mitigation and adaptation to climate change, contributing at least 10 Gross ton CO₂ per year to mitigation, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity.
- Convention on Biological Diversity**
- The Convention on Biological Diversity (CBD) entered into force on 29 December 1993.
 - It has 3 main objectives:



Q.50) Consider the following statements with reference to the Genetic Engineering Appraisal Committee:

1. It is a statutory committee constituted under certain rules framed under Environment (Protection) Act, 1986.
2. Clearance of the Genetic Engineering Appraisal Committee is mandatory for the environmental release of Genetically Modified crops.
3. It does not have any power to take punitive action.
4. It has the power to appraise activities involving large-scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.

Which of the statements given above are correct?

- (a) 2 and 4 only
(b) 1 and 3 only
(c) 1, 2 and 3 only
(d) **1, 2 and 4 only**

EXPLANATION:

The Genetic Engineering Appraisal Committee (GEAC) is the statutory committee that functions under the Ministry of Environment, Forests & Climate Change and is constituted under the “Rules for the Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/Genetically Engineered Organisms or Cells (Rules, 1989)” framed under Environment (Protection) Act, 1986. **So, Statement 1 is correct.**

Clearance of the Genetic Engineering Appraisal Committee (GEAC) is mandatory for the environmental release of Genetically Modified (GM) crops and the Approval of the GEAC is mandatory for commercial cultivation. Bt cotton is the only GM crop that has been approved for commercial cultivation in India. **So, Statement 2 is correct.**

The Genetic Engineering Appraisal Committee or any persons authorized by the committee can take punitive action under the Environment Protection Act.

The State Biotechnology Coordination Committee has powers to inspect, investigate and take punitive action in case of violations of statutory provisions through the Nodal Department and the State Pollution Control Board/Directorate of Health/Medical Services.

Therefore, Genetic Engineering Appraisal Committee has the power to take punitive action.

So, Statement 3 is not correct.

As per the Rules, 1989 (the manufacture, use, import, export and storage of hazardous microorganisms genetically engineered organisms or cells rules, 1989) of the Genetic Engineering Appraisal Committee (GEAC) is responsible for the power to the appraisal of activities that involve the large-scale use of hazardous microbes and recombinants in research and industrial production from the point of view of the environment, and these rules apply to the manufacture, import and storage of microorganisms and Gene-Technological products. **So, Statement 4 is correct.**

ADDITIONAL INFORMATION:

GENETIC ENGINEERING APPRAISAL COMMITTEE

About	The committee is also responsible for appraisal proposals relating to releasing genetically engineered (GE) organisms and products into the environment, including experimental field trials.
Members	<ul style="list-style-type: none">➤ GEAC is chaired by the Special Secretary/Additional Secretary of the Ministry of Environment, Forests & Climate Change and co-chaired by a Department of Biotechnology (DBT) representative.➤ Presently, it has 24 members, and it meets every month.
Biotechnology	"Biotechnology" means the application of scientific and engineering principles to the processing of materials by biological agents to produce goods and services
Cell Hybridization	"Cell hybridization" means the formation of live cells with new combinations of genetic material through the fusion of two or more cells using methods that do not occur naturally.
Gene Technology	"Gene Technology" means applying the gene technique called genetic engineering, including self-cloning and deletion, as well as cell hybridization.
Genetic Engineering	<ul style="list-style-type: none">➤ Genetic engineering" means the technique by which heritable material, which does not usually occur or will not occur naturally in the organism or cell concerned, generated outside the organism or the cell is inserted into said cell or organism.➤ It shall also mean the formation of new combinations of genetic material by incorporation of a cell into a host cell, where they occur naturally (self-cloning), as well as modification of an organism or in a cell by deletion and removal of

parts of the heritable material

**Institutional
Biosafety
Committee
(IBSC)**

- It was constituted by order of Rules 1989.
- An Institutional Biosafety Committee (IBSC) is to be constituted by every organization engaged in research, use & application activities related to GE organisms (organisms include microorganisms, animals, plants, arthropods, aquatic animals, etc.) and hazardous microorganisms ("microorganisms" shall include all the bacteria, viruses, fungi, mycoplasma, cells lines, algae, protodones and nematotes).

**Institutional
Biosafety
Committee
Responsibility**

- To implement and respond to institutional biosafety & biosecurity at the institutional level.
- Evaluation of applications/ reports related to rDNA technology work involving the GE organisms and non-GE hazardous microorganisms in an organization.

Q.51) Arrange the following ores in the order of increasing iron content :

1. Limonite
2. Siderite
3. Haematite
4. Magnetite

Select the correct answer using the code given below :

- (a) 1-2-3-4
- (b) 2-3-4-1
- (c) 3-4-1-2**
- (d) 4-1-2-3

EXPLANATION:

Iron, the second most abundant metal in the earth's crust, is extracted from its oxides; Haematite (Fe_2O_3), Magnetite (Fe_3O_4), Limonite ($\text{FeO}(\text{OH})$), carbonate Siderite (FeCO_3) are the important iron ores, and Iron pyrites (FeS_2) are not considered to be an important ore of iron.

Increasing iron content in Iron :

- Ø Haematite Ore – 68 %
- Ø Magnetite Ore - 60 %
- Ø Limonite Ore - 35-50 %
- Ø Siderite Ore - less than 40 %

So, Option (c) is correct.

ADDITIONAL INFORMATION:

IRON ORES

- | | |
|----------------------|--|
| About | <ul style="list-style-type: none">Ø Iron ore deposits are found in practically every state of India. However, 96 per cent of the total reserves are in Orissa, Jharkhand, Chhatisgarh, Karnataka and Goa.Ø These states also account for 96 per cent of the country's total production of iron ore. About 3 per cent of the country's total production comes from Tamil Nadu, Maharashtra and Andhra Pradesh. |
| Haematite Ore | <ul style="list-style-type: none">Ø Haematite ore contains up to 68 per cent of iron. It is red in colour and is often referred to as 'red ore'. Found in peninsular India's Dharwad and Cuddapah rock systems.Ø The majority of it is found in Odisha, Jharkhand, Chhattisgarh, and Andhra Pradesh and In western section, Karnataka, Maharashtra, and Goa have the highest concentrations. |
| Magnetite Ore | <ul style="list-style-type: none">Ø The magnetite ore contains up to 60 per cent iron. It is dark brown to blackish in colour and is often referred to as 'black ores'. These are magnetic in nature and can be found in the Dharwad and Cuddapah systems.Ø Karnataka, Andhra Pradesh, Rajasthan, Tamil Nadu, and Kerala have the most reserves. |
| Limonite Ore | <ul style="list-style-type: none">Ø Limonite is the third type of ore found in the Raniganj coal field in Uttarakhand, Garhwal in Uttar Pradesh, Mirzapur in Uttar Pradesh, and Kangra Valley in Himachal Pradesh.Ø It is yellow in colour.Ø It contains 35 – 50 per cent of iron. |
| Siderite Ore | <ul style="list-style-type: none">Ø The Siderite ore contains less than 40 per cent of iron.Ø Siderite and hematite occur as beds in shale or as concretionary masses in sandstone of the Barakar Formation.Ø It is Ash- grey to brown in colour. |

Q.52) Consider the following statements with reference to the Himalayas :

1. It is a complex mountain system formed mostly of sedimentary and metamorphic rocks.
2. The Shiwaliks are separated from the Northern Plains of India by the Main Boundary Thrust.
3. Duns and Duars are the longitudinal valleys or alluvial plains found in the Himalayan region.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) **1 and 3 only**
- (d) 1, 2 and 3

EXPLANATION:

- Ø Fold mountains are defined by complex, vital geologic forms known as folds. Fold mountains are created where two or more of Earth's tectonic plates are pushed together. At these colliding, compressing boundaries, rocks and debris are warped and folded into rocky outcrops, hills, mountains, and entire mountain ranges. Most of these mountains are composed primarily of sedimentary rock and metamorphic rock formed under high pressure and relatively low temperatures.
- Ø The rugged, soaring heights of the Himalayas, Andes, and Alps are all active fold mountains. The sedimentary rocks of the Himalayas include shale and limestone. Metamorphic rocks of the region include schist and gneiss. **So, Statement 1 is correct.**

A surface along which a rock body has broken/fractured and has been displaced is known as a fault. The Himalayan Front Fault is the one that separates the Great Plains of India from the Shiwaliks, whereas the Main Boundary Fault separates the Shiwaliks from the Lesser Himalayas. **So, Statement 2 is not correct.**

The Outer Himalayas or the Shiwaliks is the outermost range of the Himalayas. The altitude varies between 900-1100 meters and the width lies between 10-50 KM. They have low hills like Jammu Hills, etc. The longitudinal valleys lying between Siwalik and Lesser Himalayas (Himachal) are called Duars and 'Duns' like Dehra Dun, Kotli Dun, and Patli Dun are also present here. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

HIMALAYAS

- About**
 - Ø The Himalayas are one of the youngest, loftiest and mightiest mountains in the world.
 - Ø The Himalayas are the young fold mountains.
 - Ø This is the highest mountain range in the world.
 - Ø Himalayas act as a natural barrier. The extreme cold, snow, and rugged topography discourage the neighbors to enter India through the Himalayas.
 - Ø They run from the west-east direction from Indus to Brahmaputra along the northern boundary of India covering a distance of 2500 KM.
 - Ø Their width varies from 400 in the west and 150 KM in the East
- Types**
 - Ø Greater Himalayas or Himadari
 - Ø Lesser Himalayas or Himachal
 - Ø Outer Himalayas or Shiwaliks



Q.53) In India, National Waterways are operational in which of the following rivers :

1. River Mandovi
2. River Zuari
3. River Narmada
4. River Tapti
5. River Kali

Select the correct answer using the code given below :

- (a) 1, 2 and 3
- (b) 3 only
- (c) 1, 2, 3 and 4**
- (d) 3, 4 and 5

EXPLANATION:

National Waterways (NWs) are declared under the National Waterways Act 2016, and 13 National Waterways (NWs) are operational for shipping, navigation, and cargo/passenger vessels.

Sl. No.	National Waterway (NW) operational	Length (km)	Location (S)
1	National Waterways in Goa:	41 km	Goa
	(i) River Mandovi- NW-68- Usgaon Bridge to the Arabian Sea		
	(ii) River Zuari- NW-111-Sanvordem Bridge to Marmugao Port	50 km	Goa
2	National Waterways in Gujarat:	227 km	Gujarat and Maharashtra
	(i) River Narmada -NW-73-Pandhariya near Gujarat-Maharashtra border)		
	(ii) River Tapti-	436 km	

Currently, River Kali-NW-52- from Sangrur in Punjab to Ankola in Karnataka, which covers six states Punjab, Haryana, Rajasthan, Madhya Pradesh, Maharashtra and Karnataka is not Operational. **So, Option (c) is correct.**

ADDITIONAL INFORMATION:

NATIONAL WATERWAYS

About The Government of India set up the Inland Waterways Authority of India (IWAI), a statutory body under the Ministry of Shipping in 1986 with the responsibility of regulating and developing National Waterways in the country for shipping and navigation.

Important National Waterways of India

No	National Waterway	Details of Waterways	STATES
1	National Waterway 1	Ganga-Bhagirathi-Hooghly River System (Haldia - Allahabad)	Uttar Pradesh, Bihar, Jharkhand & West Bengal
2	National Waterway 2	Brahmaputra River (Dhubri - Sadiya)	Assam
3	National Waterway 16	Barak River	Assam
4	National Waterway 3	West Coast Canal (Kottapuram - Kollam), Champakara and Udyogmandal Canals	Kerala
5	National Waterway 4	Krishna River (Vijayawada - Muktyala)	Andhra Pradesh
6	National Waterway 5	Dhamra-Paradio via Mangalagadi to Pankopal	Odisha
7	National Waterway 8	Alappuzha- Changanassery Canal	Kerala
8	National Waterway 9	Alappuzha-Kottayam - Athirampuzha Canal	Kerala Alternate route: 11.5km
9	National Waterway 27	Cumberjua River	Goa
10	National Waterway 68	Mandovi River	Goa
11	National Waterway 86	Rupnarayan River	West Bengal
12	National Waterway 97	Sunderbans Waterway	West Bengal
13	National Waterway 111	Zuari River	Goa
14	National Waterway 28	Dabhol Creek Vasisti River	Maharashtra
15	National Waterway 73	Narmada River	Maharashtra & Gujarat
16	National Waterway 85	Revadanda Creek - Kundalika River System	Maharashtra
17	National Waterway 94	Sone River	Bihar
18	National Waterway 100	Tapi River	Maharashtra & Gujarat

Q.54) Which of the following islands form the first island chain of the USA's Island chain strategy?

1. Taiwan
2. Andaman and Nicobar
3. Diego Gracia
4. Ryukyu Islands
5. Ternate Islands

Select the correct answer using the code given below:

- (a) **1 and 4 only**
(b) 2 and 3 only
(c) 1, 2 and 3 only
(d) 1, 2, 3, 4 and 5

EXPLANATION:

The First Island Chain of the USA comprises the Kuril Islands, the Japanese Archipelago, the Ryukyu Islands, Taiwan, the northwest Philippines and ending at Borneo. This island chain is the first line of defence of the USA and serves as the maritime boundary between the East China Sea and the Philippine Sea and the South China Sea and the Sulu Sea. **So, Option (a) is correct.**

ADDITIONAL INFORMATION:

The first island chain of the USA

What is it?



- Ø Island Chain Strategy was formulated by John Foster Dulles in 1951.
- Purpose:** to contain the erstwhile USSR and China with a string of naval bases in the western Pacific region to restrict sea access to these two countries
- Ø This strategy did not gain much traction during the Cold War but after the USSR broke up into 15 countries on December 26, 1991, the Island Chain Strategy gained momentum to contain China, whose growing economic prowess and its desire for hegemony in the Indo-Pacific region was no open secret.
- Ø The strategy encompasses three island chains-
 - the First Island Chain,
 - the Second Island Chain and
 - the Third Island Chain, all three of which are in the Pacific Ocean.
- Ø Of late it has been proposed to create a Fourth and a Fifth Island Chain too in the Indian Ocean.
- Ø **First Island Chain** comprises the Kuril Islands, the Japanese Archipelago, the Ryukyu Islands, Taiwan, the northwest Philippines and ending at Borneo. In this chain are located the Bashi Channel and the Miyako Strait which are critical chokepoints for China.
- Ø **The Second Island Chain** consists of the Bonin Islands, Volcano Islands, Mariana Islands, western Caroline Islands and Western New Guinea. This chain is the eastern maritime boundary of the Philippine Sea.
- Ø **The Third Island Chain** refers to the Aleutian Islands running through the centre of the Pacific Ocean through the Hawaiian Islands, American Samoa, and Fiji culminating at New Zealand.
- Ø **The Fourth Island Chain** proposes to have the Lakshadweep Islands, Maldives, Diego Garcia with Gwadar and Hambantota in Pakistan and Sri Lanka respectively.
- Ø **The Fifth Island Chain** is planned to originate from Camp Lemonnier in the Gulf of Aden, around the Horn of Africa, along the East African coastline, through the Mozambique Channel towards South Africa with the aim of encircling the Chinese naval bases in Doraleh and Djibouti.

Q.55) Consider the following pairs :

Reservoirs		Rivers
1. Krishnarajasagar	-	Kaveri
2. Tawa	-	Narmada
3. Jawahar Sagar	-	Yamuna
4. Bargi	-	Bhagirathi

How many pairs given above is/are correctly matched ?

- (a) Only one pair
- (b) Only two pairs**
- (c) Only three pairs
- (d) All four pairs

EXPLANATION:

- Ø In 1932, the Krishna Raja Sagar Dam was built over the Kaveri River for the districts of Mysore and Mandya in Karnataka. The dam is named after Krishnaraja Wodeyar IV, the monarch of the Mysore Kingdom. Sir M. Vishweshwaraiah, one of India's greatest engineers, designed the dam. Engineers Day is observed on September 15th, his birthday.
 - Ø The reservoir also serves as the primary drinking water supply for the whole city of Mysore and nearly all of Bangalore.
 - Ø The water released from this dam is also used as a major water supply in Tamil Nadu. **So, Pair 1 is correct**
 - Ø Tawa dam is a multipurpose project situated upstream of Ranipur village and downstream of Tawa and Denwa confluence which are tributaries of Narmada river. It is in Itarsi, Hoshangabad District, and Madhya Pradesh (above Betul district).
 - Ø It is built across the Tawa River under the Narmada basin intercepting a catchment area of 5982.90 km² built between 1958 and 1978. The dam provides irrigation to thousands of hectares of farmland in the districts of Hoshangabad and Harda. During the monsoon season, it is also a popular tourist destination. **So, Pair 2 is correct**
 - Ø The Jawahar Sagar Dam was built across the Chambal River. It is around 24 kilometers (15 miles) south-west of Kota. It is one of the dams constructed as part of the Chambal Valley project of Rajasthan and Madhya Pradesh.
 - Ø The Jawahar Sagar Dam and Power House construction was undertaken in the third stage of the "Chambal Valley Development Scheme" project, and work began in 1964. It consists of three 33 MW units with a total generation capacity of 60,000 KW. **So, Pair 3 is not correct**
- In Madhya Pradesh, Jabalpur's Bargi Dham is built on the Narmada River. This Dam's significance grows since it is an important source of water supply in Jabalpur and the neighbouring areas. Two significant irrigation projects established on this Dam are the Bargi Divarshan Project and the Rani Avantibai Lodhi Sagar Project. **So, Pair 4 is not correct**

ADDITIONAL INFORMATION:

DAMS OF NATIONAL IMPORTANCE IN INDIA

1	Karjan	Gujarat	1987	Karjan
2	Ukai Dam	Gujarat	1972	Tapi
3	Kadana	Gujarat	1979	Mahi
4	Sardar Sarover	Gujarat	2017	Narmada
5	BHAKRA (BBMB)	Himachal Pradesh	1963	Sutlej
6	PONG(Beas Dam)	Himachal Pradesh	1974	Beas.
7	CHAMERA I (NHPC)	Himachal Pradesh	1994	Ravi
8	BASPA II (Kuppa Barrage)	Himachal Pradesh	2002	Baspa
9	KOL (NTPC)	Himachal Pradesh	2015	Sutlej
10	SALAL (Rockfill Dam) NHPC	Jammu and Kashmir	1987	Chenab...
11	SALAL (Concrete Dam) NHPC	Jammu and Kashmir	1987	Chenab...
12	BAGLIHAR	Jammu and Kashmir	2009	Chenab..
13	TENUGHAT	Jharkhand	1978	Damodar.
14	Supa Dam	Karnataka	1987	Kali Nadi
15	Lakhya Dam	Karnataka	1994	LAKHYA HOLE

16	Almatti Dam	Karnataka	2000	Krishna
17	K.R.Sagara Dam	Karnataka	1931	Cauvery
18	Tungabhadra Dam	Karnataka	1953	Tungabhadra
19	Linganamakki Dam	Karnataka	1964	Sharavathi
20	Bhadra Dam	Karnataka	1965	Bhadra
21	Malaprabha Dam	Karnataka	1972	Malaprabha
22	Hidkal Dam	Karnataka	1977	Ghataprabha
23	Hemavathy Dam	Karnataka	1979	Hemavathy
24	Kakki	Kerala	1966	Kakki
25	Idukki	Kerala	1974	Periyar
26	Cheruthoni	Kerala	1976	Cheruthoni
27	Kulamavu	Kerala	1976	Kilivallithode
28	Idamalayar(E B)	Kerala	1987	Idamalayar
29	Kulamavu Saddle	Kerala	1977	Ghataprabha
30	INDIRA SAGAR	Madhya Pradesh	2006	Narmada
31	BAN SAGAR	Madhya Pradesh	2006	Sone.

32	RANI AWANTI BAI Indhi Sagar (NVDA)	Madhya Pradesh	1988	Narmada
33	TAWA	Madhya Pradesh	2001	tawa
34	TAWA DAM	Madhya Pradesh	1978	Tawa
35	Srisailem Project (N.S.R.S.P)	Andhra Pradesh	1982	Krishna
36	Sornasila Reservoir	Andhra Pradesh	1986	Pennar
37	Kandaleru Balancing Reservoir	Andhra Pradesh	1996	Khandaleru
38	Middle Vaitarna	Maharashtra	2012	Vaitarna
39	ADIVALI	Maharashtra	1980	Local Nala
40	UJJANI	Maharashtra	1980	Bhima
41	JAYAKWADI	Maharashtra	1976	Godavan.
42	KOYNA	Maharashtra	1964	Koyna.
43	ISAPUR	Maharashtra	1982	Penganga
44	TOTLADOH	Maharashtra	1989	Pench
45	Tuinal Dam	Mizoram	2017	Tuinal
46	HIRAKUD	Odisha	1956	Mahanadi Rivcr
47	BALIMELA	Odisha	1977	Sileru
48	RFNGALI	Odisha	1984	Brahmani River

49	UPPER KOLAB	Odisha	1988	Kolab
50	UPPER INDRAVATI	Odisha	1996	Indravati
51	KAPUR (Upper Indravati Project)	Odisha	1994	Kapur
52	MURAN (Upper Indravati Project)	Odisha	1981	Muran
53	PODAGADA (Upper Indravati Project)	Odisha	1996	Podagada
54	RANJIT SAGAR	Punjab	1999	Ravi
55	BISALPUR	Rajasthan	1999	Banas
56	RANAPRATA P SAGER	Rajasthan	1970	Chambal
57	MAHI BAJAJ SAGAR	Rajasthan	1985	Mahi
58	Mettur	Tamil Nadu	1934	Cauvery
59	Sholayar	Tamil Nadu	1971	Sholayar
60	Vandal Odai	Tamil Nadu	2007	Vandal Odai
61	RIHAND	Uttar Pradesh	1962	Rihand
62	MATATILA	Uttar Pradesh	1958	Betwa
63	RAJGHAT	Uttar Pradesh	2000	Betwa
64	RAM GANGA	Uttarakhand	1974	Ram Ganga.

Q.56) Consider the following statements with reference to roadways and railways in India :

1. Generally, the states with the highest density of roads also have the highest railways in India.
2. In the new numbering system of National Highways, all north-south oriented highways will have even numbers, and all east-west oriented highways will have an odd numbers.
3. The railway zones of India are demarcated such that they are in concurrence with the state boundaries.

Which of the statements given above is/are correct ?

- (a) 1 and 2
- (b) 2 only
- (c) 3 only
- (d) 2 and 3

EXPLANATION:

The length of road per 100 sq. km of area is known as the density of roads.

State of Kerela has the highest road length of 2,38,773 km, which gives it a road density of 614 km per 100 sq. km of area. But the state of Uttar Pradesh has the largest railway density is nearly twice (40 km) the national average of 20 km per 1000 sq km of area.

Therefore, the states with the highest road density do not have the highest railways in India. **So, Statement 1 is not correct.**

In the new numbering system of National Highways, numbering from North-South oriented highways will be done based on even numbers increasing from East to West. At the same time, odd numbers will be used to mark East-West routes increasing from North to South. **So, Statement 2 is correct.**

The Zonal and Divisional boundaries are not demarcated to concur with the state boundaries; hence, they are decided by operational/administrative requirements. Some states have railway lines under the jurisdictional control of more than one Zonal Railway/Division.

Therefore, the railway zones of India are not considerations of State Boundaries.



So, Statement 3 is not correct.

- Q.57) Consider the following statements with reference to the Geological formation of India :
1. Peninsular India was a part of the old landmass since the formation of the Earth's crust.
 2. The Indo-Gangetic plain came into existence during the Tertiary Period.
 3. The Himalayas started to develop during the Pleistocene period.

Which of the statements given above is/are correct ?

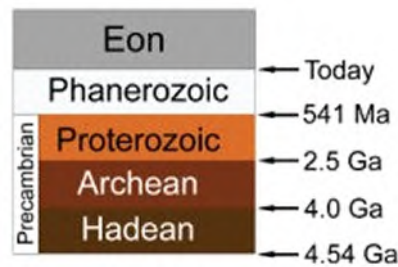
- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) **1 only**
- (d) 1, 2 and 3

EXPLANATION:

The Geological history of India is complex as well as varied. Geologically, about 200 million years ago, the subcontinent of India was a part of the Gondwanaland (the Southern Continent). The geological history of India is unique, as Peninsular India was a part of the old landmass since the formation of the Earth's crust. **So, Statement 1 is correct.**

Indo-Gangetic Plain or North Indian Plain, stretching westward from the combined delta of the Brahmaputra River valley and the Ganges River to the Indus River valley. The region contains the subcontinent's richest and most densely populated areas. The greater part of the plain is made up of alluvial soil deposited by the three main rivers and their tributaries. Whereas the Himalayas were developed by the collision of the Indian and Eurasian plates during the Tertiary period, these plains came into existence by filling up the sediments from the Himalayas during the Pleistocene period.

Thus, the Himalayas formed during the Tertiary period, and the Indo- Gangetic plain was developed during the Pleistocene period. **So, Statements 2 and 3 are not correct.**



Most of Earth's history happened during the Precambrian.

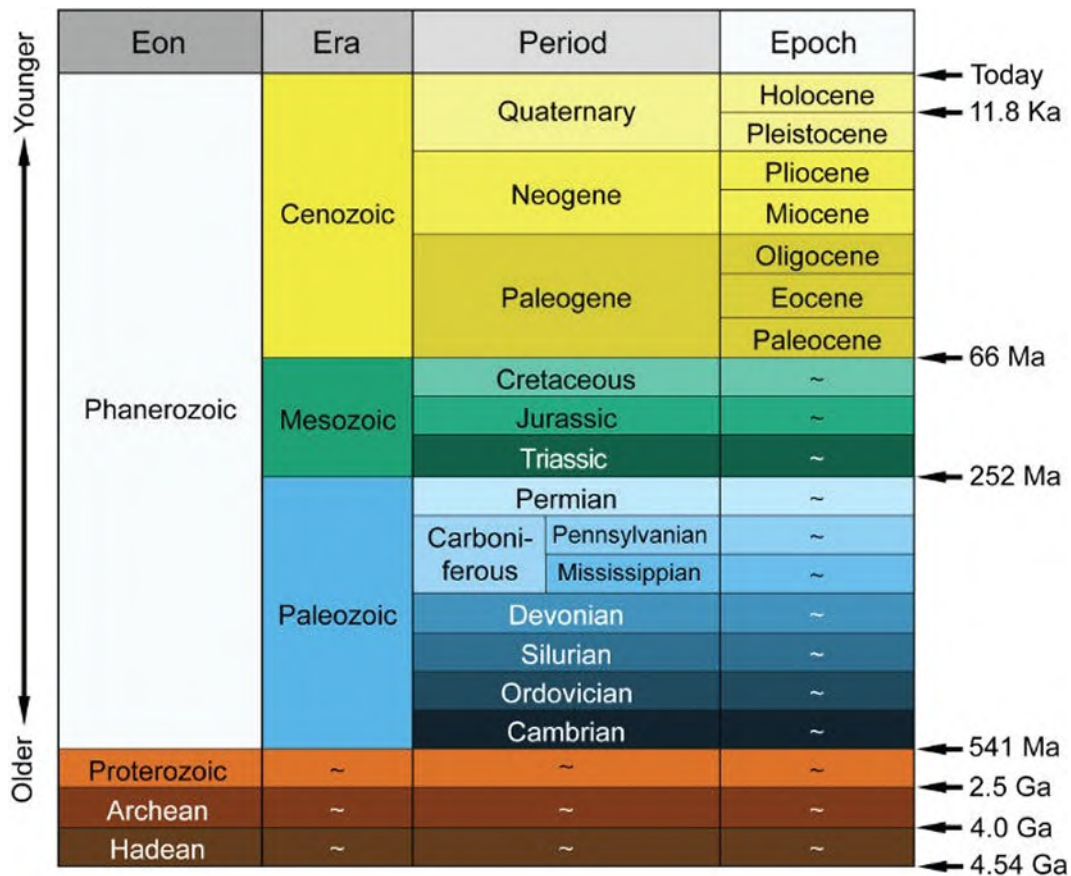
Era	Period	Epoch	Age
Cenozoic	Quaternary	Holocene	0.01 Ma
		Pleistocene	
	Tertiary	Pliocene	1.8 Ma
		Miocene	5 Ma
		Oligocene	24 Ma
		Eocene	34 Ma
		Paleocene	55 Ma
			65 Ma
Mesozoic	Cretaceous	Late	99 Ma
		Early	144 Ma
	Jurassic	Late	159 Ma
		Middle	180 Ma
		Early	180 Ma
			206 Ma

Formation of Indo-gangetic plain

Formation of Himalayas

Ma: Million years before present

ADDITIONAL INFORMATION:



Q.58) Consider the following pairs :

- | <i>Tree</i> | - | <i>Forest</i> |
|--------------------|---|----------------------|
| 1. Gurjan | - | Evergreen forest |
| 2. Mahua | - | Monsoon forest |
| 3. Deodar | - | Himalayan forest |

Which of the pairs given above is/are correctly matched ?

- (e) 1 and 2 only
- (f) 2 and 3 only
- (g) 3 only
- (h) 1, 2 and 3**

EXPLANATION:

- Ø Gurjan is a lofty tree, about 35 m tall. It is found in Tropical moist evergreen forests (Evergreen forest)
- Ø The Gurjan trees belong to the botanical family of Dipterocarpus which has about 70 different species. Out of these species the Dipterocarpus Turbinatus (which is Gurjan), is an important source of commercial timber. Amongst other uses, the trees also yield an Oil (called Gurjan ka Tel) which is also commercially marketed.
- Ø A very large number of these Gurjan trees are found in the Andaman and Nicobar Islands near India.
- Ø Tropical rainforests are called Evergreen forests. These thick forests occur in the regions near the

equator and close to the tropics. These regions are hot and receive heavy rainfall throughout the year. As there is no particular dry season, the trees do not shed their leaves altogether. This is the reason they are called evergreen. The thick canopies of the closely spaced trees do not allow the sunlight to penetrate inside the forest even in the day time. Hardwood trees like rosewood, ebony, and mahogany are common here. **So, Pair 1 is correct.**

- Ø Mahua is a tropical monsoon deciduous forest tree. Tribal communities such as Gond and Baiga tribes in Madhya Pradesh collect Mahua flowers, fruits, seeds, and leaves for their economic importance.
- Ø The tropical monsoon deciduous forests are found in areas receiving annual rainfall of 100 to 200 cm in India, with a distinct dry and rainy season and a small range of temperatures.
- Ø They occur on the wetter western side of the Deccan Plateau, the north-eastern part of the Deccan Plateau, and the lower slopes of the Himalayas, on the Siwalik Hills from Jammu in the west to West Bengal in the east.
- Ø They cover parts of Chhattisgarh, Orissa, Bihar, Jharkhand, Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu.
- Ø The principal trees of these forests are teak, sal, sandalwood, mahua, khair, mango, jackfruit, wattle and bamboo, semal, sisasm, myrobalan, arjun, and the banyan tree. **So, Pair 2 is correct.**
- Ø The Deodar Cedar is native to the Himalayan forest. It can be found at elevations ranging from 3,500 - 12,000 feet.
- Ø The Deodar Cedar is identified by its flat top (at maturity), widespread swooping branches, blue-green needles, gray scaly bark, and small cones. Deodar Cedars are pyramidal when young due to their pointed top. These evergreen conifers mature to have broad, swooping horizontal branches with flat tops. Branches can spread from 10-15 feet outwards from the trunk. This medium-growing tree can grow to be 20-50 feet tall.
- Ø They typically live in temperate forests but can span across a range of biomes.
- Ø The Himalayan forest is a Coniferous forest. The trees in this forest are tall, softwood evergreen trees. Chir, pine, and cedar are the important variety of trees in these forests. **So, Pair 3 is correct.**

Q.59) Consider the following pairs :

Waterfalls	-	States
1. Barehipani	-	Odisha
2. Vantawung	-	Meghalaya
3. Dudh sagar	-	Goa
4. Bundla	-	Himachal Pradesh

How many pairs given above is/are correctly matched?

- (e) Only one pair
- (f) Only two pairs
- (g) Only three pairs**
- (h) All four pairs

EXPLANATION:

- Ø Barehipani Falls is a two-tiered waterfall located in the middle of the Simlipal National Park in the Mayurbhanj district, Orissa India. It is one of the highest waterfalls in India.
- Ø The Barehipani Falls has a total height of 399 meters. It is a tiered waterfall with two drops. The tallest single drop is 259 meters.
- Ø It is the 2nd largest waterfall in India and is situated on the Budhabalanga River flowing over the Meghasuni Mountain. Kunchikal Falls in Karnataka is the highest waterfall in India. **So, Pair 1 is correct.**
- Ø Vantawng khawthla or Vantawng Fall is the highest and most spectacular of all the waterfalls and cascades in the fast-flowing rivers of Mizoram.
- Ø It is located in Vanva River near Thenzawl and is named after Vantawnga who was said to be an

excellent swimmer.

- Ø The height of the fall is recorded as 750 ft and though it is difficult to get close to it because of the sheer forested hillsides surrounding it, a comfortable viewing tower has been constructed. **So, Pair 2 is not correct.**

Dudhsagar literally means 'Sea of Milk'. Though perennial, the beauty of the waterfall increases multi-fold during the rainy season. Dudhsagar Waterfall is situated inside the Bhagwan Mahavir wildlife sanctuary in the Sanguem district of Goa close to the border with Karnataka. It is located on The River Mandovi. **So, Pair 3 is correct.**

Bundla waterfall is located in the Kangra valley of Palampur in the state of Himachal Pradesh. This waterfall spins a majestic charm on its viewers with water flowing from a height of 100 meters, down into the Bundla River. This magnificent waterfall is surrounded by dense forests, cliffs, and tea gardens. The waterfall is 2 km from Palampur. **So, Pair 4 is correct.**

Q.60) Consider the following statements with reference to Electricity generation in India :

1. Coal-based thermal power plants generate almost three-fourths of India's Electricity.
2. The Installed power generation capacity of the Private Sector is greater than the central sector.
3. The amount of energy generated from Non-Fossil Fuels is topped by Solar energy, followed by wind energy.

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

EXPLANATION:

In India, power is generated from both Non- Renewable (Thermal, Nuclear & Hydro) and renewable sources (Wind, Solar, Biomass etc.). However, Major production of Electricity has been achieved through coal, a thermal power plant which is around 75% of the total power generation. Three-fourths of the electricity is from coal-based plants. These coal-based power plants are the backbone of the power supply in the country. **So, Statement 1 is correct.**

The installed Power Generation Capacity is majorly by the Private sector (2,03,825 MW), followed by the State Sector (1,04,966 MW), and the Central Sector (99,005 MW). Thus, The Installed power generation capacity of the Private Sector is greater than the central sector. **So, Statement 2 is correct.**

1.Total Installed Capacity (As on 30.09.2022) - Source : Central Electricity Authority (CEA)

INSTALLED GENERATION CAPACITY (SECTOR WISE) AS ON 30.09.2022

Sector	MW	% of Total
Central Sector	99,005	24.3%
State Sector	1,04,966	25.7%
Private Sector	2,03,825	50.0%
Total	4,07,797	

Energy generated from Non-Fossil Fuels is Hydro, Wind, Solar, BM Power/Cogen, Waste to Energy, and Small Hydro Power. The energy generated from solar energy is 60,814 MW, and from wind energy is 41.666 MW. Thus, the amount of energy generated from Non-Fossil Fuels is topped by Solar energy(15%), followed by Hydro energy(11.5%), not wind energy(10.2%). **So, Statement 3 is not correct.**

Installed GENERATION CAPACITY(FUELWISE) AS ON 30.09.2022

CATAGORY	INSTALLED GENERATION CAPACITY(MW)	% of SHARE IN Total
Fossil Fuel		
Coal	204,079	50.0%
Lignite	6,620	1.6%
Gas	24,824	6.1%
Diesel	562	0.1%
Total Fossil Fuel	2,36,086	57.9%
Non-Fossil Fuel		
RES (Incl. Hydro)	164,930	40.4%
Hydro	46,850	11.5 %
Wind, Solar & Other RE	118,080	29.0 %
Wind	41,666	10.2 %
Solar	60,814	14.9 %
BM Power/Cogen	10,206	2.5 %
Waste to Energy	495	0.1 %
Small Hydro Power	4,899	1.2 %
Nuclear	6,780	1.7%
Total Non-Fossil Fuel	171,710	42.1%

ADDITIONAL INFORMATION:

- Electricity generation in India** ∅ India's power sector is one of the most diversified in the world. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power to viable non-conventional sources such as wind, solar, agricultural and domestic waste. Electricity demand in the country has increased rapidly and is expected to rise further in the years to come.
- ∅ In order to meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required. India was ranked fourth in wind power, fifth in solar power and fourth in renewable power installed capacity as of 2020. India is the only country among the G20 nations on track to achieve the targets under the Paris Agreement.
- Policy Support** ∅ 100% FDI allowed in the power sector has boosted FDI inflow. Schemes such as Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS) are expected to augment electrification across the country.

Q.61) Consider the following pairs :

<i>Vegetation</i>	<i>Region</i>
1. Tropical evergreen	- Western Ghats
2. Temperate evergreen	- Central parts of India
3. Thorny	- Rajasthan desert
4. Dry Deciduous	- Northeast India

How many pairs given above is/are correctly matched ?

- (a) Only one pair
(b) Only two pairs
(c) Only three pairs
(d) All four pairs

EXPLANATION:

- ∅ Tropical evergreen forests are restricted to heavy rainfall areas of the Western Ghats and the island groups of Lakshadweep, Andaman and Nicobar, upper parts of Assam and Tamil Nadu coast.
- ∅ They are at their best in areas having more than 200 cm of rainfall with a short dry season.
- ∅ The trees reach great heights up to 60 metres or even above. Since the region is warm and wet throughout the year, it has luxuriant vegetation of all kinds — trees, shrubs and creepers giving it a multilayered structure.
- ∅ There is no definite time for trees to shed their leaves. As such, these forests appear green all year round. **So, Pair 1 is correct.**
- ∅ The temperate evergreen forests are located in the mid-latitudinal coastal region. They are commonly found along the eastern margin of the continents. Temperate evergreen vegetation is found in northeast India regions.
- ∅ Tropical deciduous is the monsoon forests found in a large part of India, northern Australia and Central America. These regions experience seasonal changes. Trees shed their leaves in the dry season to conserve water. Deciduous vegetation grows in central parts of India owing to moderate climatic conditions prevailing over there. **So, Pair 2 is not correct.**
- ∅ The Thorn Forests are the natural vegetation consisting of thorny trees and bushes. This type of vegetation is found in the north-western part of the country, including semi-arid areas of Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Uttar Pradesh and Haryana.

- Ø In this regions, the rainfall would be less than 70 cm
- Ø Acacias, palms, euphorbias and cacti are the main plant species. Trees are scattered and have long roots penetrating deep into the soil to get moisture. The stems are succulent to conserve water. Leaves are mostly thick and small to minimise evaporation. These forests give way to thorn forests and scrubs in arid areas.
- Ø In these forests, the common animals are rats, mice, rabbits, foxes, wolves, tigers, lions, wild ass, horses and camels. **So, Pair 3 is correct.**
- Ø Tropical Deciduous forests are the most widespread forests in India. They are also called monsoon forests and spread over the region receiving rainfall between 200 cm and 70 cm.
- Ø Trees of this forest type shed their leaves for about six to eight weeks in dry summer. Based on the availability of water, these forests are further divided into moist and dry deciduous.
- Ø The moist deciduous is found in areas receiving rainfall between 200 and 100 cm. These forests exist, mostly in the eastern part of the country — North-eastern states, along the foothills of the Himalayas, Jharkhand, West Odisha and Chhattisgarh, and on the eastern slopes of the Western Ghats.
- Ø Teak is the most dominant species of this forest. Bamboos, sal, shisham, sandalwood, khair, Kusum, arjun and mulberry are other commercially important species.
- Ø The dry deciduous forests are found in areas having rainfall between 100 cm and 70 cm. These forests are found in the rainier parts of the Peninsular plateau and the plains of Bihar and Uttar Pradesh.
- Ø There are open stretches, in which teak, sal, peepal and neem grow. A large part of this region has been cleared for cultivation and some parts are used for grazing.
- Ø In these forests, the common animals found are lions, tigers, pigs, deer and elephants. A huge variety of birds, lizards, snakes and tortoises are also found here. Thus dry deciduous is not found in the north eastern part of India. **So, Pair 4 is not correct.**

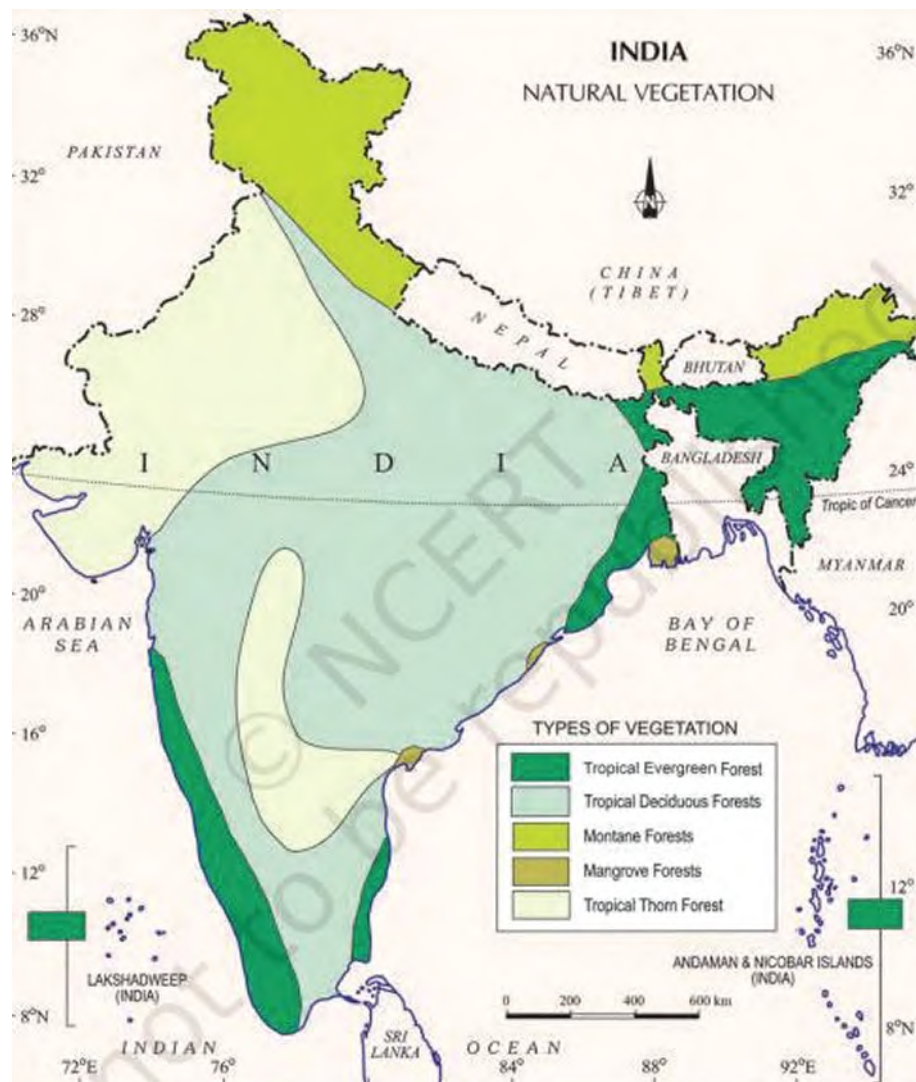
ADDITIONAL INFORMATION:

TYPES OF VEGETATION IN INDIA

- | | |
|------------------------|---|
| About | <p>The following major types of vegetation may be identified in our country</p> <ul style="list-style-type: none"> · Tropical Evergreen Forests · Tropical Deciduous Forests · Tropical Thorn Forests and Scrubs · Montane Forests · Mangrove Forests |
| Montane Forests | <ul style="list-style-type: none"> Ø In mountainous areas, the decrease in temperature with increasing altitude leads to the corresponding change in natural vegetation. As such, there is a succession of natural vegetation belts in the same order as we see from the tropical to the tundra region. Ø The wet temperate type of forests is found between a height of 1000 and 2000 metres. Ø Evergreen broad-leaf trees, such as oaks and chestnuts predominate. Ø Between 1500 and 3000 metres, temperate forests containing coniferous trees, like pine, deodar, silver fir, spruce and cedar, are found. These forests cover mostly the southern slopes of the Himalayas, places having high altitudes in southern and northeast India. Ø At higher elevations, temperate grasslands are common. At high altitudes, generally, more than 3,600 metres above sea level, temperate forests and grasslands give way to the Alpine vegetation. Ø Silver fir, junipers, pines and birches are the common trees of these forests. Ultimately, through shrubs and scrubs, they merge into the Alpine grasslands |

Mangrove Forests

- ∅ These are used extensively for grazing by nomadic tribes, like the Gujjars and the Bakarwals. At higher altitudes, mosses and lichens form part of tundra vegetation.
- ∅ The common animals found in these forests are Kashmir stag, spotted deer, wild sheep, jackrabbit, Tibetan antelope, yak, snow leopard, squirrels, Shaggy horn wild ibex, bear and rare red panda, sheep and goats with thick hair.
- ∅ The mangrove tidal forests are found in the areas of coasts influenced by tides. Mud and silt get accumulated on such coasts.
- ∅ Dense mangroves are the common varieties with roots of the plants submerged underwater.
- ∅ The deltas of the Ganga, the Mahanadi, the Krishna, the Godavari and the Kaveri are covered by such vegetation. In the Ganga-Brahmaputra delta, Sundari trees are found, which provide durable hard timber. Palm, coconut, keora, agar, etc., also grow in some parts of the delta.
- ∅ Royal Bengal Tiger is a famous animal in these forests. Turtles, crocodiles, gharials and snakes are also found in these forests.



Q.62) Consider the following statements :

1. The sale and distribution of sugar are regulated under the Essential Commodities Act of 1955.

2. The export of sugar was carried out through the Agricultural and Processed Food Products Export Development Authority.

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

EXPLANATION:

Essential Commodities Act is an enacted in the interest of the general public, for the control of the production, supply and distribution of, and trade and commerce, in certain commodities. The Central Government may, add or remove a commodity from the Schedule of essential commodities, if it is satisfied that it is necessary so to do in the public interest in consultation with the State Governments.

The Schedule of Essential Commodities include,

- (1) drugs (as desined in the Drugs and Cosmetics Act, 1940);
- (2) fertilizer, whether inorganic, organic or mixed;
- (3) foodstuffs, including edible oilseeds and oils;
- (4) hank yarn made wholly from cotton;
- (5) petroleum and petroleum products;
- (6) raw jute HI jute textiles;
 - (i) seeds of food-crops and seeds of fruits and vegetables;
 - (ii) seeds of cattle fodder; and
 - (iii) jute seeds.

Sugar is entitled as an essential commodity according to this act. This act defines sugar as,

- Ø any form of sugar containing more than ninety per cent, of sucrose, including sugar candy;
- Ø khandsari sugar or bura sugar or crushed sugar or any sugar in crystalline or powdered form; or
- Ø sugar in process in vacuum pan sugar factory or raw sugar produced therein.

So, Statement 1 is correct.

The export of sugar was carried out through the Agricultural and Processed Food Products Export Development Authority (APEDA) under the Ministry of Commerce & Industry. **So, Statement 2 is correct.**

ADDITIONAL INFORMATION:

ESSENTIAL COMMODITIES ACT, 1955

Recently in news	The Ministry of Consumer Affairs, Food and Public Distribution has invoked the Essential Commodities Act of 1955 To curb Tur dal's rising prices.
Reasons for Invoking the Act	<ul style="list-style-type: none">Ø Tur prices have risen since mid-July 2022 amid slow progress in Kharif sowing compared to last year, 2021, due to excess rainfalls and water logging conditions in parts of the major Tur growing states of Karnataka, Maharashtra and Madhya Pradesh.Ø The Government is taking a pre-emptive (to prevent) step to control prices and the overall availability of Tur if there is any unwarranted price rise in the domestic and overseas markets to take necessary pre-emptive measures in the event of unwarranted price rise in the upcoming high demand festival months.
About Act	<ul style="list-style-type: none">Ø Essential commodities are not specifically defined in the Essential Commodities Act 1955. Still, Section 2(A) of the Act underlines that an "essential commodity" means a commodity mentioned in the Schedule of the Act.Ø The Act was enacted to stop the hoarding and black marketing of food items.Ø The Act empowers the Central Government to control certain commodities' production, supply, distribution, trade, and commerce.

- Tur Dal in India**
- Ø Tur is a long-duration 180 days pulses variety grown in rainfed conditions.
 - Ø It is grown in many states, Karnataka, Maharashtra, Uttar Pradesh etc.
 - Ø India meets about 10-12% of its domestic consumption through imports.

Q.63) Consider the following statements :

1. These soils are locally termed as reh, kallar and usar.
2. This soil is generally infertile and unfit for agricultural use.
3. These soils are mostly found in areas with a dry climate and poor drainage.

Which one of the following Soils best applies to the above statements ?

- (a) Arid Soils
- (b) Saline Soils**
- (c) Peaty Soils
- (d) Laterite soils

EXPLANATION:

- Ø Saline soil is found in arid and semiarid areas of Rajasthan, Punjab, Haryana, Uttar Pradesh, and Bihar. Alkaline encrustations of sodium, calcium, and magnesium are found in these soils.
- Ø The saline soils occupy 1.70 lakh square kilometers of the land surface of the country in areas of dry climatic conditions and poor drainage characteristics of waterlogged and swampy areas.
- Ø Saline soils are locally termed reh, kallar, and usar and are generally infertile and so are unfit for agricultural use.
- Ø These soils are quite common in western Gujarat, deltas of eastern coastal plains, and the Sundarbans delta of West Bengal. In the Rann of Kutch, the monsoon winds laden with sea salts deposit the salt particles on the soil and form a crust on the surface.
- Ø The intrusion of seawater into the deltas also results in the formation of saline soils. In many places, as a result of over-irrigation, fertile soils are also turning into saline soils. In Punjab and Haryana, farmers are advised to add gypsum to the soil to check the growing problem of salinity.

So, Option (b) is correct.



ADDITIONAL INFORMATION:

TYPES OF SOIL

Arid Soils



- Ø Arid soils range from red to brown in colour.
- Ø They are generally sandy in structure and saline in nature.
- Ø In some areas, the salt content is so high that common salt is obtained by evaporating the saline water.
- Ø Due to the dry climate, high temperature, and accelerated evaporation, they lack moisture and humus.
- Ø Nitrogen is insufficient and the phosphate content is normal.
- Ø Lower horizons of the soil are occupied by 'kankar' layers because of the increasing calcium content downwards.
- Ø The 'Kankar' layer formation in the bottom horizons

Peaty Soils



Laterite soils



restricts the infiltration of water, and as such when irrigation is made available, the soil moisture is readily available for sustainable plant growth.

- Ø Arid soils are characteristically developed in western Rajasthan, which exhibits characteristic arid topography.
- Ø These soils are poor and contain little humus and organic matter.
- Ø They are found in areas of heavy rainfall and high humidity, where there is a good growth of vegetation.
- Ø Thus, a large quantity of dead organic matter accumulates in these areas, and this gives rich humus and organic content to the soil.
- Ø Organic matter in these soils may go even up to 40-50 percent.
- Ø These soils are normally heavy and black in colour.
- Ø In many places, they are alkaline also. It occurs widely in the northern part of Bihar, the southern part of Uttarakhand, and the coastal areas of West Bengal, Odisha, and Tamil Nadu

- Ø The laterite soils develop in areas with high temperatures and high rainfall.
- Ø These are the result of intense leaching due to tropical rains.
- Ø With rain, lime and silica are leached away, and soils rich in iron oxide and aluminum compounds are left behind.
- Ø The Humus content of the soil is removed fast by bacteria that thrive well in high temperatures.
- Ø These soils are poor in organic matter, nitrogen, phosphate, and calcium, while iron oxide and potash are in excess.
- Ø Hence, laterites are not suitable for cultivation; however, the application of manures and fertilizers is required for making the soils fertile for cultivation.
- Ø Red laterite soils in Tamil Nadu, Andhra Pradesh, and Kerala are more suitable for tree crops like cashew nuts.
- Ø Laterite soils are widely cut as bricks for use in house construction.
- Ø These soils have mainly developed in the higher areas of the Peninsular plateau.
- Ø The laterite soils are commonly found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, and the hilly areas of Odisha and Assam.

Q.64) Which among the following types of coal deposits took the longest time to form ?

- (a) Peat
- (b) Lignite
- (c) Bituminous
- (d) Anthracite**

EXPLANATION:

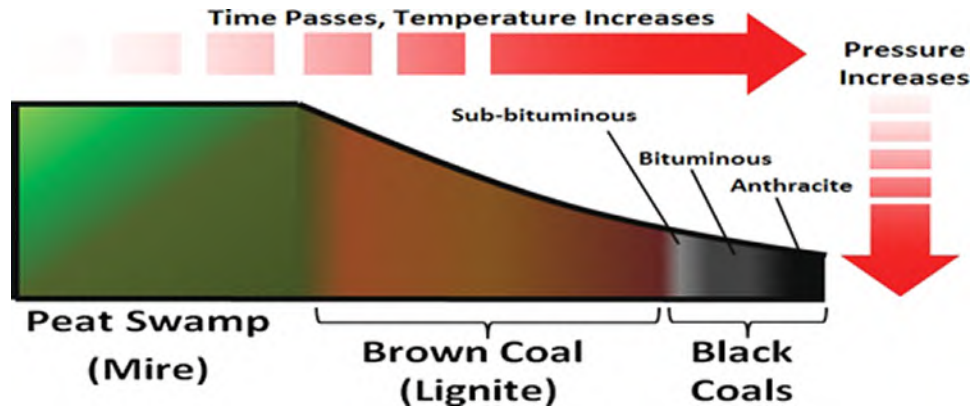
Coal is a fossil fuel, formed from vegetation, which has been consolidated between other rock strata and altered by the combined effects of pressure and heat over millions of years to form coal seams.

There are 4 types of coal they are peat, lignite, bituminous, and anthracite among which anthracite is the oldest coal deposits that took the longest time to form (approximately 2.5 billion to 541 million years ago). **So, Option (d) is correct.**

ADDITIONAL INFORMATION:

TYPES OF COAL IN INDIA

- | | |
|-------------------|--|
| Peat | <ul style="list-style-type: none">Ø Peat is not coal, but can eventually transform into coal under the right circumstances.Ø Peat is an accumulation of partially decayed vegetation that has gone through a small amount of carbonization.Ø However, peat is still considered part of the coal “family” because it contains energy that its original plants contained.Ø It also contains high amounts of volatile matter and gases such as methane and mercury, which are environmentally hazardous when burned. Peat retains enough moisture to be spongy.Ø This makes it a valuable environmental defense against flooding.Ø Peat can also be integrated into soil to help it retain and slowly release water and nutrients. |
| Lignite | <ul style="list-style-type: none">Ø Lignite coal is the lowest rank of coal.Ø It has carbonized past the point of being peat but contains low amounts of energy—its carbon content is about 25-35%.Ø It comes from relatively young coal deposits, about 250 million years old.Ø Lignite, a crumbly brown rock also called brown coal or rosebud coal, retains more moisture than other types of coal.Ø This makes it expensive and dangerous to mine, store, and transport.Ø It is susceptible to accidental combustion and has very high carbon emissions when burned.Ø Lignite is mainly combusted and used to generate electricity |
| Bituminous | <ul style="list-style-type: none">Ø Bituminous coal is formed under more heat and pressure, and is 100 million to 300 million years old.Ø It is named after the sticky, tar-like substance called bitumen that is also found in petroleum. It contains about 45-86% carbon.Ø Coal is a sedimentary rock, and bituminous coal frequently contains “bands,” or strips, of different consistency that mark the layers of plant material that were compressed. |
| Anthracite | <ul style="list-style-type: none">Ø Anthracite is the highest rank of coal. It has the most amount of carbon, up to 97%, and therefore contains the most energy.Ø It is harder, denser, and more lustrous than other types of coal.Ø Almost all the water and carbon dioxide have been expelled, and it does not contain the soft or fibrous sections found in bituminous coal or lignite.Ø Because anthracite is a high-quality coal, it burns cleanly, with very little soot.Ø It is more expensive than other coals, and is rarely used in power plants; instead, anthracite is mainly used in stoves and furnaces. |



Q.65) Which of the following are the east-flowing rivers between Mahanadi and Pennar ?

1. Rushikulya
2. Musi
3. Vamsadhara
4. Manneru
5. Sharavathi
6. Kandleru
7. Tandava

Select the correct answer from the codes given below :

- (a) 1, 2, 4 and 6 only
- (b) 2, 3, 5 and 7 only
- (c) 1, 4, 5 and 6 only
- (d) 1, 2, 3, 4 and 7 only

EXPLANATION:

- Ø The basin of east-flowing rivers between Mahanadi and Pennar spreads over the states of Andhra Pradesh and Odisha, having an area of 86,643 Sq.km and stretches between 78°40' to 85°1' east longitudes and 14°34' to 20°22' north latitudes.
- Ø The independent rivers which directly drain into the Bay of Bengal as east-flowing rivers from north to south here in this basin are the Rushikulya, the Bahuda, the Vamsadhara, the Nagavali, the Sarada, the Varaha, the Tandava, the Eluru, the Gundlakamma, the Musi, the Paleru and the Manneru.
- Ø Whereas the river Sharavati originates and flows entirely within the state of Karnataka. It is one of India's few westward-flowing rivers, and a major part of the river basin lies in the Western Ghats. The famous Jog falls are formed by this river.
- Ø The Kandleru reservoir is an irrigation project built on the Kandleru river in the Rapur Town of the Nellore district. The project is part of the Telugu Ganga, which supplies drinking water to Chennai from the Srisailem reservoir on the Krishna river. It serves as a link to the Somasila reservoir. But the Nellore region is not under the river basin of east-flowing rivers between Mahanadi and Pennar.

So, Option (d) is correct.

ADDITIONAL INFORMATION:

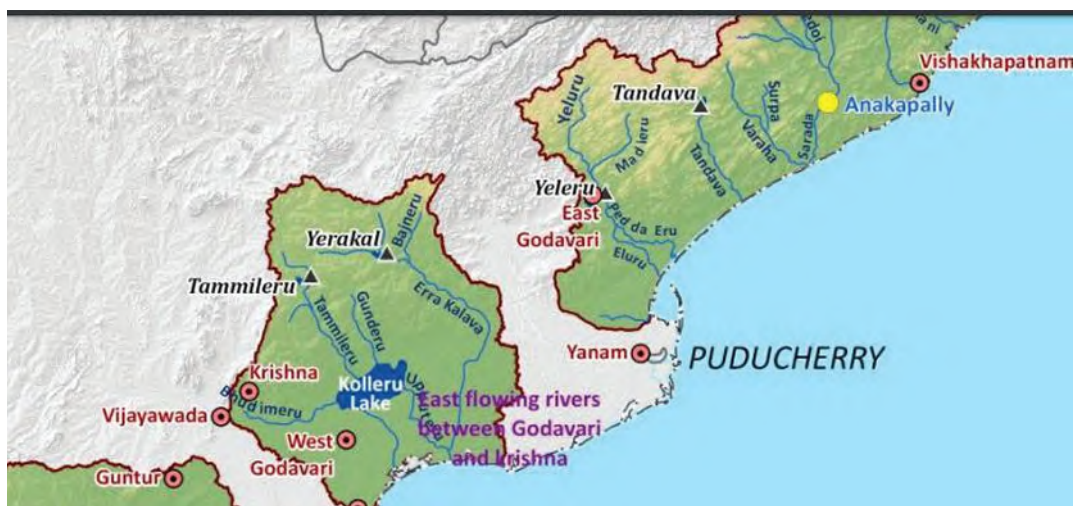
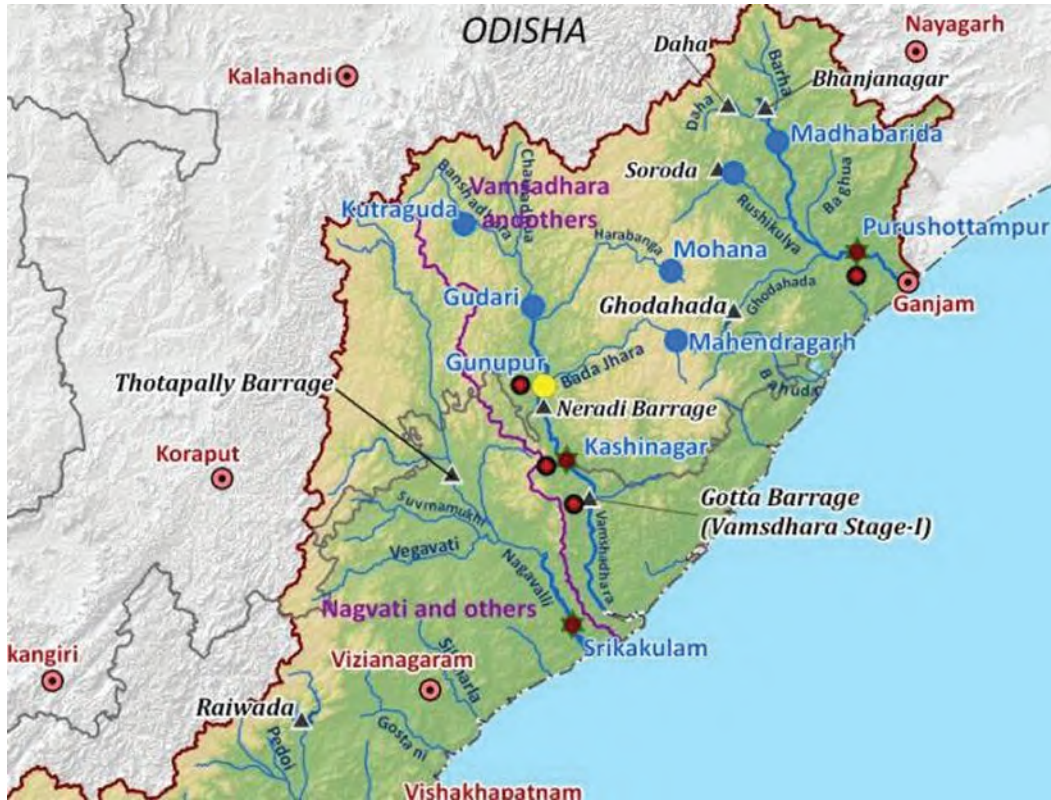
EAST FLOWING RIVER BASIN BETWEEN MAHANADI AND PENNAR

About Ø It is bounded by the Eastern Ghats on the north and west, by Nallamala Range and Andhra plains on the south, and by the Bay of Bengal on the east. This composite basin comprises three river systems.

Ø The river systems between Mahanadi and Godavari cover an area of 49,685 Sq.km, and the

river systems between Krishna and Pennar extend over an area of 24,669 Sq.km. In addition, there is also a small area between Godavari and Krishna, drained mainly by the small stream of Palleru. This minor portion of the basin has an area of about 12,289 Sq.km.

- ∅ The major part of the basin is covered by agricultural land accounting for 59.85% of the total area, and water bodies cover 3.66% of the basin.





Q.66) Which one of the following statements best reflects the term “AlphaFold” sometimes seen in the news recently?

- (a) It is a hypothetical planet that is said to be 10 times the size of the Earth.
- (b) It is an Artificial intelligence based protein structure prediction tool.**
- (c) It is the first space-based solar telescope in China.
- (d) It is a new variant of coronavirus found in Russian bats.

EXPLANATION:

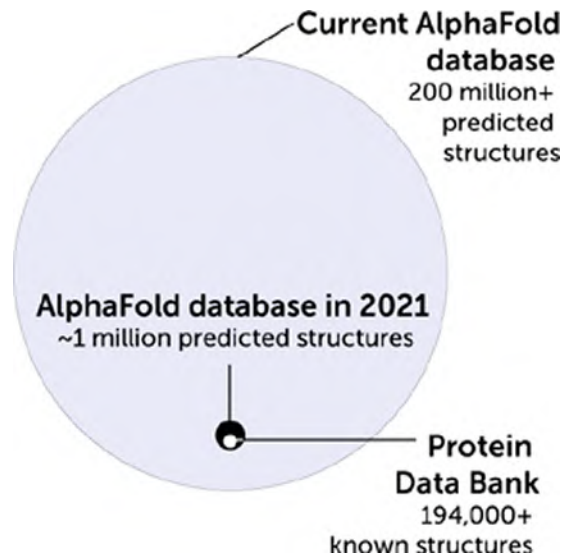
Proteins are commonly referred to as the building blocks of life, made up of some combination of amino acids.

AlphaFold, is an AI system developed by DeepMind, which is able to computationally predict protein structures from its amino-acid sequence with unprecedented accuracy and speed. **So, Option (b) is correct.**

ADDITIONAL INFORMATION:

ALPHAFOLD

Recently In news Alpha Fold, developed by DeepMind, a company based in London, announced that it had predicted the three-dimensional structures of more than 200 million proteins and has accurately predicted protein structures from their amino acid sequences.



About

- ∅ AlphaFold is an AI-based protein structure prediction tool.
- ∅ It is based on a computer system called a deep neural network.
 - Neural networks use a large amount of input data and provide the desired output exactly like how a human brain would as the human brain inspires it.
 - The real work is done by the black box between the input and the output layers, called the hidden networks.
- ∅ AlphaFold is fed with protein sequences as input.
- ∅ When protein sequences enter through one end, the predicted three-dimensional structures come out through the other.
- ∅ It is like a magician pulling a rabbit out of a hat.

How does it work

It uses processes based on “training, learning, retraining and relearning”.

First step uses the available structures of 1,70,000 proteins in the Protein Data Bank (PDB) to train the computer model.

Then, it uses the results of that training to learn the structural predictions of proteins not in the PDB.

Once that is done, it uses the high-accuracy predictions from the first step to retrain and relearn to gain higher accuracy of the earlier predictions.

By using this method, AlphaFold has now predicted the structures of the entire 214 million unique protein sequences deposited in the Universal Protein Resource (UniProt) database.

Q.67) Consider the following statements with reference to the Karewa formations :

1. They are the lacustrine deposits of sand, clay, loam, silt and boulders.
2. The Kashmir Himalayas are famous for Karewa formations.
3. They are useful for the cultivation of Saffron, Almond and Walnut.

Which of the statements given above is/are correct?

- (a) 1 and 3 only
- (b) 2 and 3 only
- (c) 2 only
- (d) **1, 2 and 3**

EXPLANATION:

- Ø Karewas are the lacustrine deposits in the Valley of Kashmir and Bhadarwah Valley of the Jammu Division of Jammu & Kashmir. Karewas are the flat-topped mounds that border the Kashmir Valley on all sides.
- Ø They are composed of fine silt, clay, sand, and boulder gravel.
- Ø According to geologists, during the Pleistocene Period, the entire valley of Kashmir was under water. Subsequently, the Baramullah Gorge was created by the endogenetic forces, and the lake was drained through these gorges. The deposits left in the process are known as karewas.
- Ø The Kashmir Himalayas which are famous for the karewa formation is devoted mainly to the cultivation of saffron, almond, walnut, apricot, apple, and peach orchards in the areas of Palampur, Pulwama, and Kulgam in the Kashmir Valley. **So, Option (d) is correct.**

Q.68) Consider the following statements :

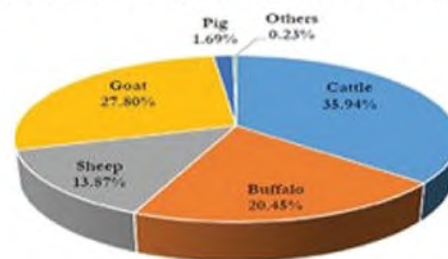
1. They constitute 3rd in India's livestock population.
2. They are the leading contributors to the total milk production in India.
3. Murrah is an indigenous breed of this livestock.

Which one of the following livestock best applies to the above statements ?

- (a) Milch Cattle
- (b) Goat
- (c) **Buffalo**
- (d) Donkey

EXPLANATION:

Graph 1: Livestock Population 2019 - Share of Major Species



- Ø The total number of Cattle in the country is 193.46 million in 2019 showing an increase of 1.3 % over previous Census.
- Ø The Goat population in the country in 2019 is 148.89 million showing an increase of 10.1% over the previous census
- Ø The total Buffalo in the country is 109.85 million showing an increase of about 1.1% over previous Census
- Ø According to the Department of Animal Husbandry and Dairying statistics, both indigenous and nondescript buffaloes yield about 4-6 kg of milk per day, which is higher than what indigenous and nondescript cows offer — about 2.4 to 3 kg per day. Thus buffaloes are the leading contributors to the total milk production in India

- Ø The Murrah breed of Water buffalo (*Bubalus bubalis*) is a breed of domestic buffalo kept for dairy production.
- Ø It is originally from Rohtak, Hisar and Jind of Haryana and Nabha and Patiala districts of Punjab states of India and Punjab province of Pakistan, but has been used to improve the milk production of dairy buffalo in other countries, such as Italy, Bulgaria and Egypt. **So, Option (c) is correct.**



MURRAH BREED

ADDITIONAL INFORMATION:

20TH LIVESTOCK CENSUS IN 2019

- About**
- Ø Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying has conducted the latest i.e., 20th Livestock Census in 2019 in participation with all States and Union Territories.
 - Ø It covers all domesticated animals and its headcounts for total 16 species of animals like Cattle, Buffalo, Mithun, Yak, Sheep, Goat, Pig, Horse, Pony, Mule, Donkey Camel, Dog, Rabbit and Elephant and poultry birds (Fowl, Duck, Turkeys and other poultry birds) possessed by the households, household enterprises/non-household enterprises and institutions at their site.
 - Ø Moreover, the 20th livestock census is indeed a unique attempt as for the first-time data collected in using tablets computers to digitize household level data through online transmission from the field.

Q.69) The Production-linked incentive scheme is implemented for which of the following renewable energy components ?

1. Solar Photovoltaic Cells
2. Wind Turbine
3. Solar Heaters
4. Small Hydro Power Turbines

Select the correct answer using the code given below:

- (e) 1, 2 and 3
- (f) 1 only**
- (g) 1 and 4
- (h) 2 and 4

EXPLANATION:

- Ø The PLI scheme is proposed as a financial incentive to boost domestic manufacturing of advanced technological products and attract investments. The incentives are applicable for determining sales of products manufactured in India.
- Ø The Union Cabinet chaired has given approval to introduce the Production-Linked Incentive (PLI) Scheme only in High Efficiency Solar PV Modules for Enhancing India's Manufacturing Capabilities and Enhancing Exports under the renewable energy component.
- Ø High Efficiency Solar PV Modules is the only component available under the renewable component of the Production Linked Initiative scheme.

So, Option (b) is correct.

- Q.70) Consider the following statements with reference to the oil and natural gas resources of India:
1. The sedimentary basins of India are formed only in the regions where land meets the sea.
 2. Among India's 26 sedimentary basins, only 8 basins have been opened for oil production.
 3. The largest hydrocarbon-producing basin in terms of area is also the largest in India in terms of oil and natural gas production.

Which of the statements given above is/are correct?

- (e) 1 and 2
(f) 2 only
(g) 3 only
(h) 2 and 3

EXPLANATION:

Sedimentary basins are areas in which sediment accumulates at a significantly greater rate than sediments of the same age in neighbouring areas, accumulating a greater thickness. The sediments accumulate by subsidence.

- Ø India's sedimentary area is estimated to be 3.36 million square kilometres. It consists of 26 sedimentary basins,
- Ø 1.63 million sq km of which are on land.
- Ø Shallow offshore up to 400m isobaths, with an area of 0.41 million sq km.
- Ø The deep ocean beyond the 400m isobaths has a sedimentary area of 1.32 million sq km, according to the newly classified sedimentary basins.
- Ø A sedimentary basin can be made just by erecting high land in an adjacent area by volcanism. **So, Statement 1 is not correct.**

Based on conventional resource potential, 7 basins are opened for hydrocarbon production are grouped under Category-I, covering 30% of the total basin area and holding 85% of the total unrisksed conventional hydrocarbon in place of 41.8 billion tons of oil and oil-equivalent gas. These 7 basins are namely Krishna-Godavari (KG), Mumbai Offshore, Assam Shelf, Rajasthan, Cauvery, Assam-Arakan Fold Belt and Cambay.

Recently, State-owned Oil and Natural Gas Corporation (ONGC) opened India's eighth hydrocarbon-producing basin when it started oil flow from a well in the Bengal basin. Oil production commenced from the well Asokenagar-1 in 24 Pargana district. The Bengal basin is spread across nearly 1.22 lakh square kilometres, nearly two-thirds of it falling under the waters of the Bay of Bengal. **So, Statement 2 is correct.**

The Mumbai High Field, formerly known as the Bombay High Field, is an offshore oilfield located 176 kilometres off the west coast of Mumbai in the Gulf of Cambay region of India. It is India's largest oil and natural gas production at around 75 metres of water. The oil operations are managed by India's Oil and Natural Gas Corporation (ONGC).

- Q.71) Consider the following pairs :

National Parks

Rare animal species

- | | | |
|------------------|---|----------------------|
| 1. Kanha | - | Sangai Deer |
| 2. Silent Valley | - | Lion-Tailed Macaques |

3. Gir - Asiatic lion
4. Dachigam - Hangul

How many pairs given above are correctly matched ?

- (a) Only one pair
 (b) Only two pairs
 (c) **Only three pairs**
 (d) All four pairs

EXPLANATION:

Kanha National Park is located Maikal range of Satpuras in Madhya Pradesh which forms the central Indian highlands whereas the Sangai deer is endemic and found only in Manipur. This park is mainly found in the southern part of Loktak Lake in the Keibul Lamjao National Park. **So, Pair 1 is not correct** Lion-Tailed Macaques are endangered species of primate that is commonly found in Silent Valley National Park which is located in the state of Kerala. **So, Pair 2 is correct**

The Gir National Park is located in the Junagadh district of Gujarat which is known as the only natural habitat of Asiatic lions. **So, Pair 3 is correct**

Hangul or the Kashmir Stag is the state animal of Jammu and Kashmir found in Dachigam National Park. This park is located 22 km (kilometer) from Srinagar in Jammu and Kashmir. It covers an area of 141 sq km (square kilometers). The name literally stands for 'ten villages', which could be in memory of the ten villages that were relocated to create the park. **So, Pair 4 is correct**

ADDITIONAL INFORMATION:

NATIONAL PARKS

Kanha National Park

- Ø Location: Maikal range of Satpuras in Madhya Pradesh, which forms the central Indian highlands.
- Ø The national park is also a Tiger reserve.
- Ø Spreading across two districts the Mandala and the Kalaghat, Kanha National Park has declared a reserve forest in 1879 and revalued as a wildlife sanctuary in 1933.
- Ø Its position was further upgraded to a national park in 1955.
- Ø Barasingha Traditionally known as Dolhorina which is similar to the English name (Swamp Deer), is the most abundant species found in Kanha Reserve.

Silent Valley national park

- Ø Location: Northeast corner of the Palakkad district of Kerala falls within the revenue districts of Palakkad and Malappuram
- Ø Silent Valley was named a National Park only in 1984
- Ø It constitutes the centerpiece of the Nilgiri Biosphere Reserve, an integral part of the Western Ghats, christened a World Heritage Site by UNESCO in 2012.
- Ø The most famous resident of the Park is Lion

RARE SPECIES FOUND

Swamp deer

- Swamp Deer, also known as Barasingha, is one of the most vulnerable species of deer in the Indian subcontinent as well as the world.
- The eastern swamp deer is endemic to Kaziranga
- IUCN status-Vulnerable



Lion-tailed macaques

- Characterized by grey manes around their face sometimes called bearded monkeys.
- They have a small tuft on the tip of their tail which resembles a lion's tail.
- The lion-tailed macaque is endemic to the rainforests of the Western Ghats.
- IUCN Status-Endangered

Tailed Macaque



Gir national park

- Ø Location: Junagadh district of Gujarat.
- Ø Gir National Park is the only place in the world outside Africa where a lion can be seen in its natural habitat
- Ø Declared a sanctuary in 1965 and a national park in 1975. Known for the majestic Asiatic lions

Asiatic lions

- Asiatic lions are slightly smaller than African lions that survive in the wild only in India.
- Endangered on IUCN Red List



Dachigam National Park

- Ø Location: 22 km (kilometer) from Srinagar in Jammu and Kashmir.
- Ø It was declared a national park in 1981.
- Ø The park is best known as the home of the hangul, or Kashmir stag

Hangul, or Kashmir stag

- Hangul or the Kashmir Stag is the state animal of Jammu and Kashmir
- IUCN status-Critically Endangered



Q.72) Consider the following statements with reference to the Tropical cyclone in India :

1. The eastern coast of India is more prone to cyclones than the western Coast of India.
2. The cyclone, with its whole system, moves forward from east to west in general.
3. In India, most cyclones occur only in the pre-monsoon season.

Which of the statements given above is/are correct ?

- (a) **1 and 2 only**
- (b) 2 and 3 only
- (c) 1 only
- (d) 1, 2 and 3

EXPLANATION:

Cyclones are centers of low atmospheric pressure, in which the air pressure increases from the center to the outer areas. Consequently winds flow from outside to the centers. In cyclones, winds blow in an anticlockwise direction in the northern hemisphere and clockwise in the southern hemisphere.

- Ø The Indian subcontinent is one of the worst affected regions in the world. The subcontinent with a

long coastline of 8041 kilometers is exposed to nearly 10 percent of the world's tropical cyclones.

- Ø Of these, the majorities of them have their initial genesis over the Bay of Bengal and strike the East coast of India.
- Ø On average, five to six tropical cyclones form every year, of which two or three could be severe.
- Ø More cyclones are formed in the Bay of Bengal than in the Arabian Sea due to wind patterns (that keep oceans cooler on the western side) and the ratio is approximately 4:1.
- Ø An analysis of the frequency of cyclones on the East and West coasts of India between 1891 and 1990 shows that nearly 262 cyclones occurred (92 of these severe) in a 50 km wide strip above the East coast. Less severe cyclonic activity has been noticed on the West coast, where 33 cyclones occurred in the same period, out of which 19 were severe. **So, Statement 1 is correct.**

The cyclone, with its whole system, moves forward from east to west (in the Bay of Bengal) with a speed of 15 to 30 km per hour. The movement of a cyclone in a direction is like the movement of a spinning top. Cyclones originate over the sea surface and dissipate as they reach land. **So, Statement 2 is correct.**

Cyclone is a phenomenon and is concentrated in certain seasonal cyclic segments. In India, most cyclones occur in the post-monsoon season, i.e. from October to December, or in the pre-monsoon season from April to May. The life span of a cyclone is generally from 7 to 14 days. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

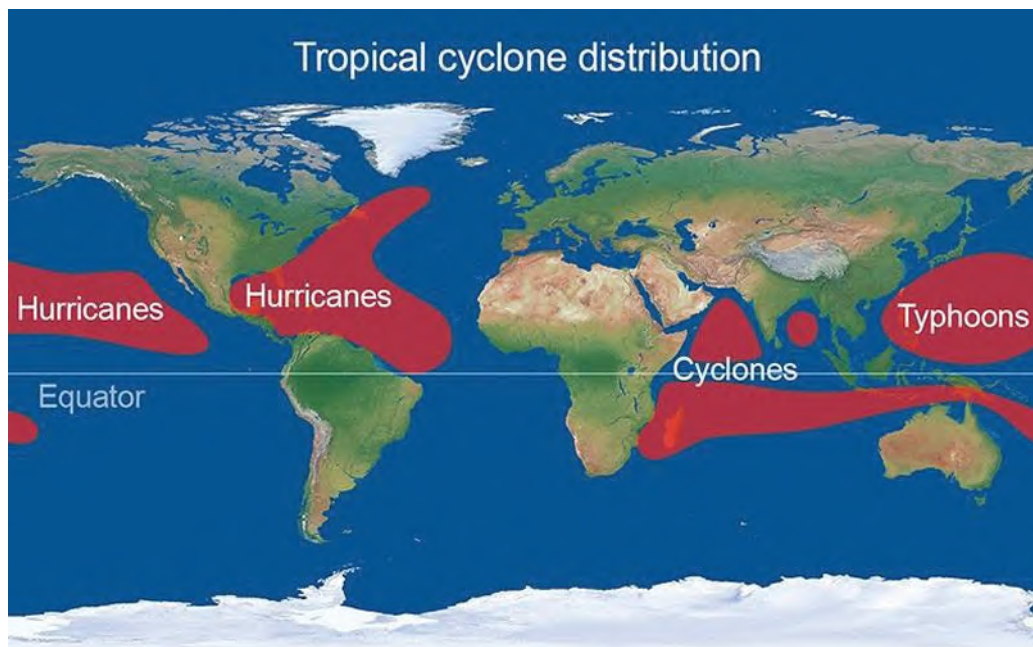
CYCLONE

- About**
- Ø Cyclones are caused by atmospheric disturbances around a low-pressure area distinguished by swift and often destructive air circulation.
 - Ø Cyclones are usually accompanied by violent storms and bad weather.
 - Ø The air circulates inward in an anticlockwise direction in the Northern hemisphere and clockwise in the Southern hemisphere.

- Classifications**
- Ø Cyclones are classified as extratropical cyclones (also called temperate cyclones); and tropical cyclones.
 - Ø The World Meteorological Organisation (WMO, 1976) uses the term 'Tropical Cyclone' to cover weather systems in which winds exceed 'Gale Force' (minimum of 34 knots or 63 kph).
 - Ø Tropical cyclones are the progeny of ocean and atmosphere, powered by the heat from the sea; and driven by easterly trades and temperate westerlies, high planetary winds, and their own fierce energy.
 - Ø In India, cyclones are classified by:
 - Strength of associated winds,
 - Storm surges
 - Exceptional rainfall occurrences

Type of Disturbances	Wind Speed in Km/h	Wind Speed in Knots (1 knot - 1.85 km per hour)
Low Pressure	Less than 31	Less than 17
Depression	31-49	17-27
Deep Depression	49-61	27-33

Cyclonic Storm	61-88	33-47
Severe Cyclonic Storm	88-117	47-63
Super Cyclone	More than 221	More than 120



Q.73) Consider the following statements with reference to the recent National Family and Health Survey:

1. As of 2022, more than three fourth of Indian states have attained the replacement total fertility rate.
2. Gujarat and Maharashtra have the highest percentage of wasted children in India.
3. The Gangetic plain states usually have high incidences of stunting, underweight and under-5 mortality.

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

EXPLANATION:

- ∅ Total fertility levels of about 2.1 children per woman. This value represents the average number of children a woman would need to have to reproduce herself by bearing a daughter who survives to childbearing age. If replacement level fertility is sustained over a sufficiently long period, each generation will exactly replace itself in the absence of migration.
- ∅ According to the ministry of Health and Family Welfare, India has achieved replacement level fertility, with as many as 31 States/Union Territories reaching a Total Fertility Rate of 2.1 or less.
So, Statement 1 is correct.

- Ø Child wasting refers to a child who is too thin for his or her height and is the result of recent rapid weight loss or the failure to gain weight
- Ø According to NFHS-5 report Maharashtra has 25.6% wasted children (weight for height) the highest which is followed by Gujarat (25.1%). **So Statement 2 is correct**

According to the NFHS-5 (2019-2021) data, the Gangetic plain states usually have high indices of stunting, underweight and under-5 mortality

States	Stunting		Under weight		Under- five mortality	
	NFHS-5	NFHS-4	NFHS-5	NFHS-4	NFHS-5	NFHS-4
Bihar	42.9	48.5	41	43.9	56.4	58.1
Uttar Pradesh	39.7	46.3	32.1	35.8	59.8	78.1
West Bengal	33.8	32.5	32.2	31.6	25.4	31.8
Punjab	24.5	25.7	16.9	21.6	32.7	33.2
Haryana	27.5	34	21.5	29.4	38.7	41.1
Uttarakhand	27	33.5	21	26.6	45.6	46.5

So statement 3 is correct

ADDITIONAL INFORMATION:

NATIONAL FAMILY AND HEALTH SURVEY OF INDIA

- About**
- Ø Conducted by- Ministry of Health and Family Welfare, Government of India with the International Institute for Population Sciences serving as the nodal agency.
 - Ø The survey provides state and national information for India on fertility, infant and child mortality, the practice of family planning, maternal and child health, reproductive health, nutrition, anaemia, utilization and quality of health and family planning services.
 - Ø Its goal:
 - To provide essential data on health and family welfare needed by the Ministry of Health and Family Welfare and other agencies for policy and programme purposes, and
 - To provide information on important emerging health and family welfare issues.

Q.74) Consider the following pairs :

River		Tributary
1. Godavari	-	Pranhita
2. Narmada	-	Kundi
3. Mahanadi	-	Moyar
4. Tapi	-	Orsang

How many pairs given above are correctly matched?

- (e) Only one pair
- (f) Only two pairs**
- (g) Only three pairs
- (h) All four pairs

EXPLANATION:

The Godavari River is the largest in peninsular India and is known as the 'Dakshina Ganga'. The Godavari River rises in Sahyadri hills, near Nasik in Maharashtra.

Pranhita is the largest tributary of the Godavari, covering about 34% of its drainage basin. It is an inter-State sub-basin among the States of Madhya Pradesh, Chhattisgarh, Maharashtra, and Telangana.

Pranahita (combined flow of Wainganga, Penganga, and Wardha) river forms the boundary between the states of Telangana and Maharashtra. **So, Pair 1 is correct**

The Narmada River of length 1300 km and drainage basin area of 92670 sq km rises from the plateau of Amarkantak of the Maikal Hills of Chhattisgarh. The tributary of this river is Heran, Orsang, Barna, Kolar, Burhnar, Banjar, Shar, Shakkar, Dudhi, Tawa, and Kundi. **So, Pair 2 is correct.**

The Moyar River is one of the tributaries of the Bhavani in Tamil Nadu, South India.

The Mayar river originates from a small town called Mayar off the Masinagudi–Ooty road. Hence, it is not a tributary of Mahanadi. **So, Pair 3 is not correct.**

Tapi River is a river in central India, and the Tapi is the second largest westward draining interstate river basin.

But the Orsang river rises in the Vindhya hill ranges of the Jhabua district of Madhya Pradesh and runs south-westerly to merge into the Narmada river and is one of the tributaries of the Narmada river. **So, Pair 4 is not correct.**

Q.75) Consider the following raw materials :

1. Latex
2. Lac
3. Willow
4. Jute
5. Silk

Which among the above raw materials is/are a plant derivative ?

- (a) **1, 3 and 4**
(b) 2 and 4
(c) 1, 2, 3 and 4
(d) 2, 3 and 5

EXPLANATION:

Latex is a milky white fluid derived from rubber trees. Latex is actually a colloidal dispersion of rubber in water.

Latex is produced in vessels or special cells called laticifers, single cells, or strings of cells that form tubes, canals, or networks in various plant organs. This differs from the internal secretory tissues (pockets, cavities, or canals) in which most resin is produced.

Natural rubber latex is most commonly used to make items like gloves, swim caps, chewing gum, mattresses, catheters, rubber bands, balloons, tennis shoes, and many other sporting goods. **So, Option 1 is correct.**

Lac is a resin that is derived from animals. Lac is obtained via the culture of these insects, a procedure known as lac culture. Lac culture necessitates proper host plant care, regular trimming of host plants, propagation, lac collecting, and processing. Lac growing host trees are Palash, Ber and Kusum trees.

Lac is used to making paints, varnishes, printing inks, cosmetics, toys, bracelets, sealing wax, gramophone records, bangles, and other items. It is used as a filler substance in the hollows of gold and silver jewellery by jewellers and goldsmiths. **So, Option 2 is not correct.**

Willows, also known as sallows and osiers, are a genus of over 400 species of generally deciduous trees and shrubs found predominantly on moist soils in cold and temperate climates. Willow bark has been used for centuries in China and Europe.

It is still used today to treat pain (especially low back pain and osteoarthritis), headache, and inflammatory disorders including bursitis and tendinitis. The fresh blossoms of Indian willow, popularly known as ooyum, are eaten and considered tasty in Manipur, NE India. This tree is known as walunj in Maharashtra. It is available in Pune, Satara, Sangli, and Kolhapur. **So, Option 3 is correct.**

Jute fibre is obtained from the stalks of the jute plant. Jute plant stalks are wrapped together and steeped in water for roughly 20 days after harvesting. The fibres are then rinsed in clear, flowing water after being separated from the stem in long threads.

Jute is extracted from the bark of the white jute plant (*Corchorus capsularis*) and, to a lesser extent, from the Tossa jute.

Jute is often used to make gunny bags, potato sacks, carpets, curtains, coarse clothing, and ropes, among other things. Nowadays, high-quality jute is also used to make jute fabrics. **So, Option 4 is correct.**

Silk is a protein fibre consisting primarily of fibroin produced by certain insect larvae to build cocoons. The most well-known silk is made from the cocoons of mulberry silkworm larvae (*Bombyx mori*) reared in captivity (sericulture).

Silk is mostly used to make apparel such as shirts, trousers, ties, skirts, and sarees and is widely used in producing various home décor furnishings.

The woven silk fibre is sometimes used to make bicycle tyres and parachutes. **So, Option 5 is not correct.**

Q.76) Consider the following statements :

1. Bhor Ghat joins Nashik with Mumbai

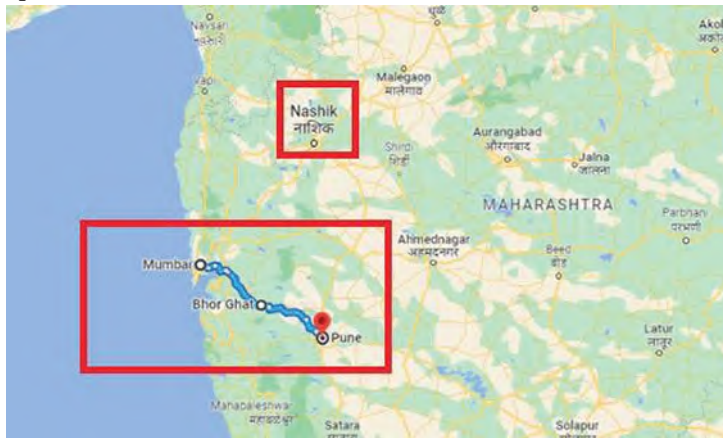
2. Shencottah Pass joins Kottayam with Madurai
3. Haldighat joins Rajsamand and Udaipur
4. Thal Ghat joins Mumbai with Pune

How many statements given above is/are correct ?

- (a) Only one statement
- (b) Only two statements**
- (c) Only three statements
- (d) All four statements

EXPLANATION:

A pass is a gap, or break, in high, rugged terrain such as a mountain ridge. Bhor Ghat connects Pune and Mumbai. This Ghat provides easy connectivity between Mumbai and Khopoli. This Ghat opened Mumbai to the Deccan plains of Peninsular India. **So, Statement 1 is not correct.**



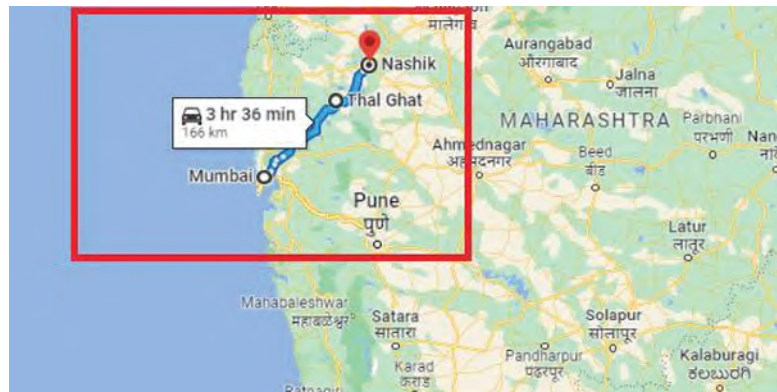
The Shencottah Pass in Tenkasi District connects the Madurai district of Tamil Nadu with the Kottayam district of Kerala. It is located in the Western Ghats. **So, Statement 2 is correct.**



Haldighati is a famed mountain pass in the hills of the Aravalli Range. Haldighati derived its name from the term 'Haldi' means turmeric in English, used as a spice in Indian delicacies, and 'Ghati' means valley, which together make the name Haldighati. This pass connects Udaipur with Rajsamand. **So, Statement 3 is correct**



Thal Ghat is a ghat section in the Sahyadri Range of Western Ghats near the town of Kasara in Maharashtra. This Pass connects Nashik with Mumbai. **So, Statement 4 is not correct.**

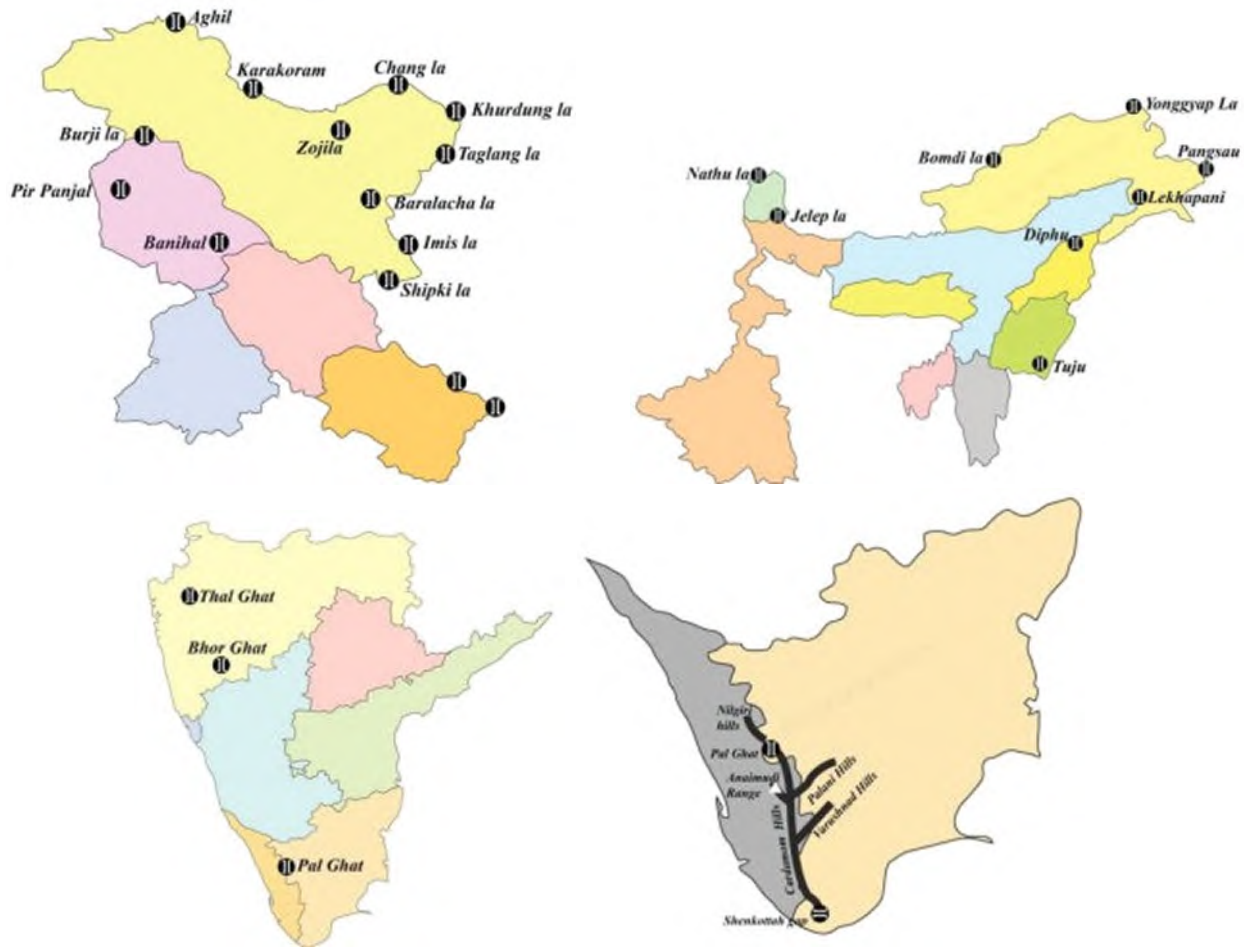


ADDITIONAL INFORMATION:

MOUNTAIN PASSES

- Ø Passes are formed when a glacier or stream erodes or wears away, the land between areas of higher terrain.
- Ø Passes often provide the easiest routes for people to travel across steep mountain ranges. For this reason, they have played an important role throughout human history in migration, trade, and settlement.
- Ø Mountain passes are connectivity routes through the mountain run which can be natural or man-made. It is a gateway to connect different parts of the country and also with neighbouring countries for different purposes.

Major passes of India



Q.77) AA state in India has the following characteristics:

1. It is bounded by independent countries on three sides.
2. In this state, Sun appears first in India.
3. The Mountainous terrain is divided into valleys by rivers flowing north to south.

Which one of the following states has all of the above characteristics?

- (e) Assam
- (f) Sikkim
- (g) Tripura

(h) Arunachal Pradesh

EXPLANATION:

Arunachal Pradesh is Popularly known as the 'Land of the Dawn-lit-Mountains'. It is India's remotest state and the first Indian soil to greet the rising sun because it is located on the easternmost side of the nation. It is located on the Northeast tip of India and surrounded by three independent countries on three sides those were china in the north, Myanmar in the east and Bhutan in the west.

The land is mostly mountainous, with the Himalayan ranges running north to south. These divide the state into five river valleys:

- Ø the Kameng
- Ø the Subansiri
- Ø the Siang
- Ø the Lohit

Ø the Tirap

The mightiest of these rivers is Siang, called the Tsangpo in Tibet, which becomes the Brahmaputra after joining the Dibang and the Lohit in the plains of Assam. Thus, Arunachal Pradesh is divided into valleys by the Brahmaputra flowing north to south. **So, Option (d) is correct.**

Q.78) Consider the following statements with reference to transportation in India :

1. The number of International Airports are higher than the State Government/Private owned Airports in India.
2. More than three fourth of the passenger traffic in India occurs through railways.
3. Almost two third of railway lines in India have been electrified till date.

Which of the statements given above is/are correct ?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1 and 3 only**

EXPLANATION:

The number of International Airports in India is 29 and the number of State Government/Private owned Airports is 16. Thus The number of International Airports is higher than the State Government/Private owned Airports in India. **So, Statement 1 is correct.**

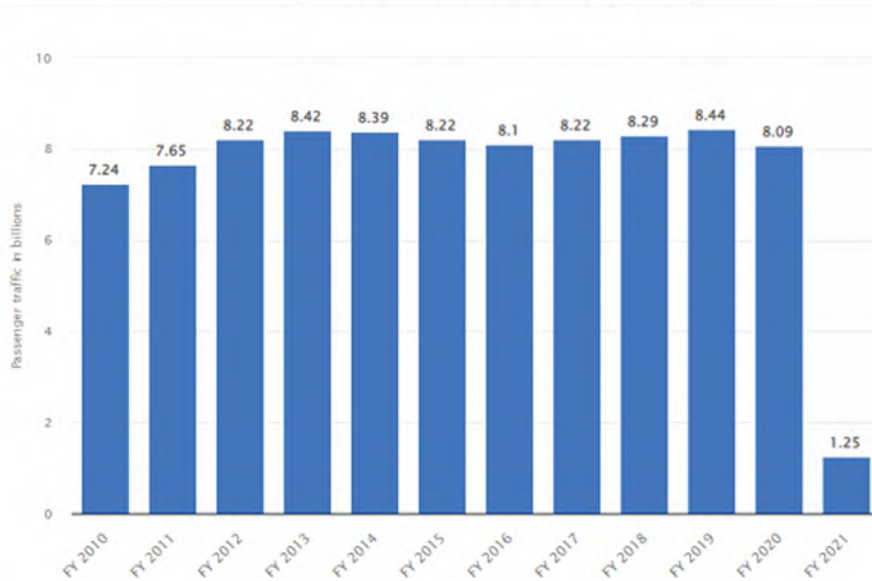


The passenger traffic in the railway sector in India in the fiscal year 2021 is around 1.3 billion across) and this decrease was mainly due to the impact of the coronavirus pandemic.

Overall, the railway network transported over 22 million passengers every day pre-pandemic. Passenger traffic at airports across India in the financial year 2022 amounted to over 188 million, including 22 million international passengers. However, there was a traffic drop for domestic and international passengers in 2021. Therefore, the passenger traffic in India that occurs through railways is not more than three fourth of the passenger traffic.

So, Statement 2 is not correct.

Passenger traffic in railways across India from financial year 2010 to 2021(in billions)



Currently, around 45,881 route kilometres (RKM) have been electrified, i.e., more than 66% of railway lines are already electrified. Hence, therefore almost two third of railway lines in India have been electrified. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

TRANSPORTATION TRENDS IN INDIA

- Recently in news**
 - Ø As per data released by Indian Ports Association, the Cargo handled by 12 major ports in India in February was 58.50 million tonnes (MT), down 6.7% month-on-month basis. Still, In January, the Cargo handled stood at 62.68 MT.
 - Ø Among the 12 major ports, the highest cargo traffic was handled by Deendayal Port at 116.86 MT, followed by Paradip Port at 103.82 MT and Jawaharlal Nehru Port Trust at 69.07 MT during April-February of that year.
- Current status of Electrification of Railway Lines in India**
 - Ø In 1947 India gained independence, and its railway network extended for more than 50,000 km.
 - Ø It has since grown to around 68,000 km, making it the fourth-largest railway network in the world.
 - Ø The share of electricity in total energy use by Indian Railways has seen a corresponding increase, wherein Railway electrification has a big role.

- Q.79) Had there been no Himalayas in the Indian subcontinent,
1. There will be no splitting of the westerly jet streams
 2. More region of northern India would have been a desert
 3. The cold Siberian air masses will enter into India

4. There will be no interception in the summer monsoon coming from the Bay of Bengal and the Arabian Sea

How many of the above statements are correct based on the given scenario ?

- (a) Only one statement
- (b) Only two statements
- (c) Only three statements
- (d) All four statements**

EXPLANATION:

The mighty Himalayas are the most pronounced and dominating physiographic feature of the subcontinent of India. It has often been said that the Himalayas are the body and soul of India. The importance of the Himalayas for its Climatic Influence on India,

- ∅ The impact of the Himalayas on the climate, especially on the distribution of precipitation and temperature, is quite significant.
- ∅ The altitude of the Himalayas, their sprawl and their extension intercept the summer monsoon coming from the Bay of Bengal and the Arabian Sea.
- ∅ They also prevent the cold Siberian air masses from entering India.
- ∅ Had there been no Himalayas, More region of northern India would have been a desert.
- ∅ According to the latest meteorological studies, the Himalayas are responsible for the splitting of the westerly jet streams into two branches, and these, in turn, play an important role in the arrival, success and failure of the monsoons in India.

So, Option (d) is correct.

ADDITIONAL INFORMATION:

HIMALAYAS

Importance Defence

- ∅ Throughout history, foreign invaders never entered India from the northern side. Despite modern technology of warfare, the Himalayas have great defence value. At present, a network of highways has been developed up to China, Tibet, Nepal, and Bhutan borders.

Source of Perennial Rivers

- ∅ Most of the perennial rivers of northern India have their origin in the glaciers, lakes, and springs of the Himalayas. These rivers sustain the teeming millions of the Indian population

Source of Fertile Soils

- ∅ The perennial rivers and their tributaries carry enormous quantities of alluvial soils. The Great Plains of India are covered by the fertile alluvial soils deposited by the rivers coming down from the Himalayas

Generation of Hydroelectricity

- ∅ The Bhakra-Nangal Dam, Giri-Bata, Chamera, Pong, Bassi, Silal, Dulhasti Baghliar Projects, Tehri Dam, Koteshwar etc., are some of the important hydel-power generating multi-purpose projects located in the Himalaya.

Forest Wealth

- ∅ The Himalayan ranges are very rich in forest resources. There is a horizontal zonation of vegetation in the Himalayas. The natural vegetation in the Himalayas varies from the humid tropical to the conifers and alpine pastures. These forests provide fuelwood, timber, gum, resins, lac, medicinal herbs, and a variety of materials for industries. At the higher altitudes are the alpine pastures (margs) used by the tribals for grazing cattle during the summer season. Orchards
- ∅ The Himalayas are known for the apple, peach, cherry, pear, mulberry, walnut, almond, and apricot orchards.

Minerals

- ∅ The Himalayas are rich in many metallic and non-metallic minerals. Coal is found in the Jammu Division of Jammu and Kashmir. Copper, lead, zinc, nickel, cobalt, gold, silver, antimony, tungsten, magnesite, limestone, semi-precious, and precious stones are found in the states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh. The poor accessibility is, however, a barrier to the exploitation of the mineral wealth of the Himalayas.

Tourism

- ∅ The Himalayas are known for their scenic and aesthetic beauty all over the world. The Himalayas offer a cool, invigorating climate when the neighbouring plains are in the grip of the scorching heat of the summer season. Millions of national and international tourists visit the hill stations in the Himalayas. The famous tourist centres in the Himalayas are Srinagar, Pahalgam, Gulmarg, Sonmarg, Yushmarg, Wular-round, Chamba, Dalhousie, Dharamshala, Shimla, Solan, Kangra, Kullu, Manali, Mussoorie, Nainital, Ranikhet, Almora, and Darjeeling.

Pilgrimage

- ∅ Apart from places of tourist interest, the Himalayas have numerous shrines and pilgrimage centres. Some of the important shrines in the Himalayas are the Amarnath, Hazratbal (Srinagar), Kailash, Vaishno Devi, Kedarnath, Badrinath, Gangotri, Yamunotri, Jwalaji, Hemkund, etc.

Q.80) In the second stage of the nuclear power programme, the thorium mat is used in the nuclear reactors. The fuel rods in such reactors are fabricated with Molybdenum and Zircon. In this context, which of the following states provides a one-stop destination for mining all the 3 minerals ?

- (a) Haryana
- (b) Rajasthan
- (c) Arunachal Pradesh
- (d) Tamil Nadu**

EXPLANATION:

According to the Indian Bureau of Mines, Tamil Nadu possesses all three minerals (ie) thorium, Molybdenum and zircon which are the required minerals for the second stage of nuclear power programme. **So, Option (d) is correct.**

ADDITIONAL INFORMATION:

NUCLEAR POWER PROGRAM OF INDIA

- About**
 - ∅ Atomic Energy has a key role in reducing the carbon intensity of the overall Power sector of India.
 - ∅ India has a largely indigenous nuclear power programme.
 - ∅ The Indian government is committed to growing its nuclear power capacity as part of its massive infrastructure development programme.
 - ∅ The government has set ambitious targets to grow nuclear capacity.
 - ∅ Because India is outside the Nuclear Non-Proliferation Treaty due to its weapons programme, it was for 34 years largely excluded from trade in nuclear plant and materials, which hampered its development of civil nuclear energy until 2009.
 - ∅ Due to earlier trade bans and lack of indigenous uranium, India has uniquely been developing a nuclear fuel cycle to exploit its reserves of thorium.
 - ∅ Since 2010, a fundamental incompatibility between India's civil liability law and international conventions limits foreign technology provision.

Thorium Thorium is used to make ceramics, welding rods, camera and telescope lenses, fire brick, heat resistant paint and metals used in the aerospace industry, as well as in nuclear reactions. Thorium has the potential to be used as a fuel for generating

Zirconium/ zircon nuclear energy
 Zirconium alloys are used as structural components for light and heavy water nuclear reactor cores because of their low capture cross-section to thermal neutrons and their good corrosion resistance

Molybdenum The presence of Molybdenum (Mo) in Zircon (Zr) alloys makes them more corrosion resistant increasing their resistance to hydrogenation and nodular corrosion during an interaction between zirconium components and high temperature water and steam in nuclear reactors.

- The three-stage nuclear power programme**
- ∅ Natural uranium fuelled Pressurised Heavy Water Reactors (PHWRs),
 - Higher Share for Nuclear Power
 - Competitive Capacity Addition.
 - Sustain and Improve Capacity Utilization.
 - Move towards Financing Capability through Internal Resource Generation.
 - Sustained Excellence in Safety Performance.
 - ∅ Fast Breeder Reactors (FBRs) utilising plutonium based fuel,
 - Commercial Demonstration of Fast Breeder Technology
 - Early setting up of Prototype Fast Breeder Reactor (PFBR) and associated Fuel Cycle Plants.
 - Advanced Fuel Cycle with Higher Breeding Gain.
 - ∅ Advanced nuclear power systems for utilisation of thorium
 - Technology Demonstration for Large Scale Thorium Utilization
 - Advanced Heavy Water Reactor (AHWR).
 - Technology Road Map on Shaping the Third Stage.



- Q.81) Consider the following statements with reference to the 'Langya Virus', which has sometimes been seen in the news recently :
1. It is a new zoonotic virus that has infected people in Sri Lanka
 2. As of now, there are no licensed drugs meant for humans.
 3. The virus transfers easily between humans
- Which of the statements given above is/are correct ?
- (a) 3 only
 - (b) 1 and 3 only
 - (c) 2 only
 - (d) 1, 2 and 3

EXPLANATION:

Langya Henipavirus or the LayV is a zoonotic virus reported in China, with 35 people infected. The new type of Henipavirus has been found in China's Shandong and Henan provinces.

Henipaviruses are classified as Bio safety Level 4 (BSL4) pathogens.

- ∅ The pathogen belongs to the henipavirus family, is closely associated with Nipah and Hendra viruses, and was noticed to cause fever and respiratory symptoms among 35 people in China since 2018. **So, Statement 1 is not correct.**

Currently, there are no licensed drugs or vaccines meant for humans. Hence, it is slightly incurable. **So, Statement 2 is correct.**

Langya, a unique Henipavirus that spreads from animals to humans, is not as contagious as coronavirus. There has been no reported human-to-human transmission yet. They can cause severe illness in animals and humans, but scientists say they are not overly concerned because the virus doesn't seem to spread easily between people, nor is it fatal. **So, Statement 3 is not correct.**

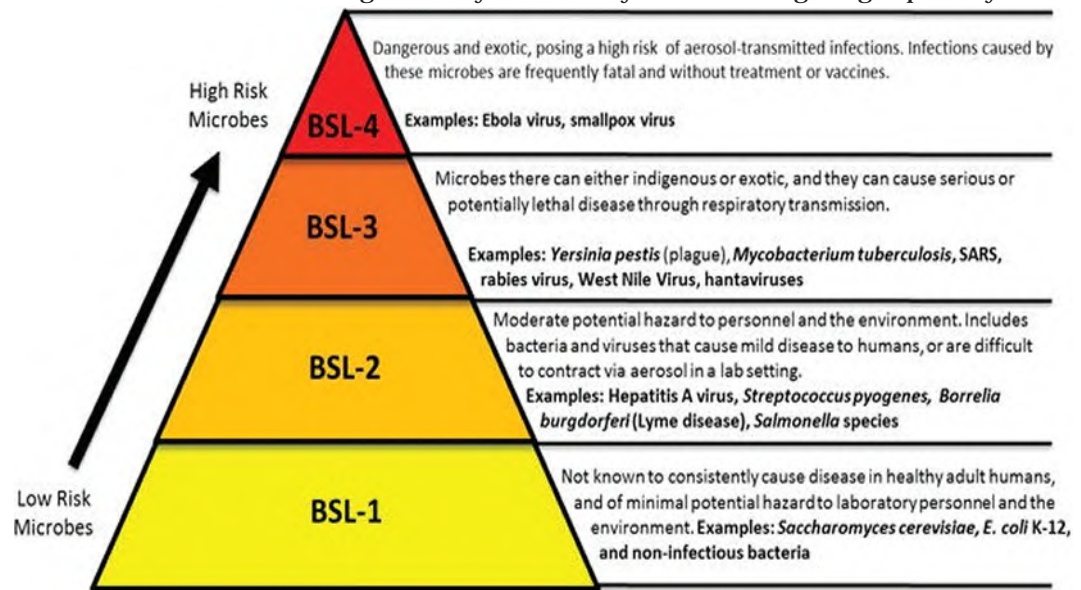
ADDITIONAL INFORMATION:

LANGYA HENIPAVIRUS (LAYV)

Symptoms The study observed 26 patients with only Langya Henipavirus (LayV) infection to identify the related symptoms.

- ∅ All infected patients had a fever with high temperature, 54% reported fatigue, 50% complained of cough, and 38% were affected by nostalgia.
- ∅ Besides, 35% of the 26 patients complained of headaches and vomiting. The investigation found that 35% had impaired liver function, while 8% had affected kidney function. Further, the patients were accompanied by abnormalities of leukopenia, thrombocytopenia, and kidney and liver dysfunction.
- ∅ Thrombocytopenia is low platelet count, whereas leukopenia means a fall in the white blood cell count, decreasing the body's immunity or disease-fighting capability.

Bio Safety Level



Q.82) Consider the following statements :

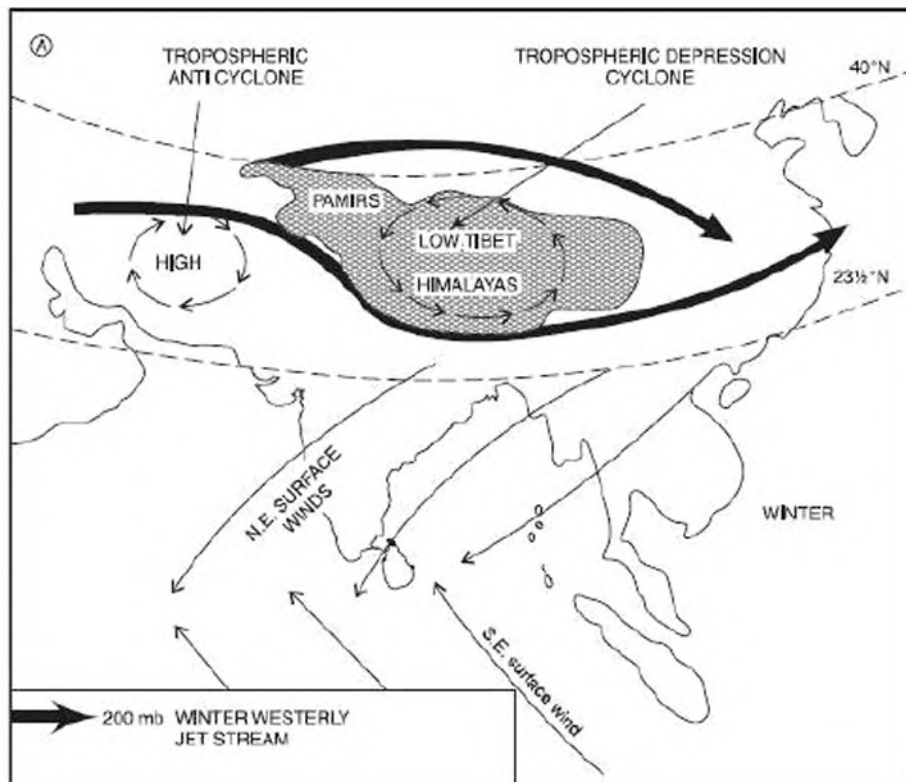
1. In the winter season, the upper air westerly jet streams are bifurcated into two branches over the Indian subcontinent.
2. The strength of the westerly jet stream contributes to the intensification of high pressure formed over the southern Indian Ocean during summer.

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

EXPLANATION:

- ∅ The changes in the upper air circulation over the Indian landmass are one of the causes of the sudden outbreak of monsoons in India. Jet streams in the upper air system influence the climate of India through the Westerly Jet stream.
- ∅ This jet stream is bifurcated by the Himalayan ranges. The northern branch of this jet stream blows along the northern side of the Himalayas. The southern branch blows eastwards and south of the Himalayan ranges along 25° N latitude.
- ∅ Meteorologists believe that the Southern branch of the jet stream significantly influences India's winter weather conditions. This jet stream is responsible for bringing western disturbances from the Mediterranean region into the Indian sub-continent. Winter rain and hail storms in north-western plains and occasional heavy snowfall in hilly regions are caused by these disturbances. These are generally followed by cold waves throughout the northern plains. **So, Statement 1 is correct.**



- ∅ Jet streams are high altitude (9000-12000 m) Westerly winds between middle latitudes in the Northern hemisphere. Recent research has shown that these winds considerably impact surface weather conditions.
- ∅ The summer-time heating of the Tibetan Plateau creates low pressure over the region, producing tropical easterly jet on the southern side of the Himalayas. This tropical easterly jet stream first develops in longitudes east of India and then extends westwards across India and the Arabian Sea to eastern Africa. Blowing along the Kolkata-Bangalore axis, the air under the easterly jet descends

over the Indian Ocean near Mascarenes and Zanzibar Islands of Tanzania and further intensifies the high pressure formed over the southern Indian Ocean.

- Ø After crossing the equator, winds become South-Westerly and are known as the South-Westerly Summer Monsoons. These surface winds have the vast potential for South-Westerly summer, monsoon, and precipitation.
- Ø Therefore, the strength of the Easterly jet stream (not westerly) contributes to the intensification of high pressure formed over the Southern Indian Ocean. **So, Statement 2 is not correct.**

Q.83) Consider the following pairs :

<i>Characteristics of Forest soil</i>	<i>Region</i>
1. High content of nitrogen and organic matter	- Meghalaya
2. Podzols	- North Western Himalaya
3. Brown soils and laterites	- Western Ghats
4. Well-decomposed humus	- Darjeeling

How many pairs given above is/are correctly matched ?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs**

EXPLANATION:

Forest soils have a heavy accumulation of organic matter due to the decomposition of leaves and other parts of plants in the forested regions. Humus predominates in forest soils, and in the upper reaches of the slopes, the soils are often acidic in nature.

- Ø The forest soils in the hilly tracts of Meghalaya and Assam have a high content of nitrogen and organic matter.
- Ø The terai region on the foothills of the Himalayas is also covered with forest soils.
- Ø Podzols dominate in the North Western Himalayan region.
- Ø In Shyadris (Western Ghats) and Eastern Ghats, brown soils and laterites are found,
- Ø Darjeeling district of West Bengal has well-decomposed humus.

So, Option (d) is correct.

ADDITIONAL INFORMATION:

CHARACTERISTICS OF FOREST SOILS

- About**
- Ø Forest soils are generally characterized by deeply rooted trees, significant 'litter layers', recycling of organic matter and nutrients, including wood, and wide varieties of soil-dwelling organisms.
 - Ø The nature of forest soils is generally very acidic, and organic, and their chemical fertility is very much limited.
 - Ø The role of ecosystem management will be all the more important for their sustainability as the soil will be poor because the organic matter of the topsoil is always more labile than mineral phases
 - Ø They are heterogeneous in nature and have varied properties of soil that vary with mountainous climate and altitude.
 - Ø It has a high amount of humus, but they are deficient in minerals like potash, phosphorus, and lime. which is why these types of soils are suitable for the plantation of tea, coffee, spices, and tropical fruits.

- Ø It is generally characterized by loamy and silty on valley sides and coarse-grained on the upper slopes.
- Ø The soil is acidic with low humus content in the snow-covered area.

Q.84) Consider the following statements with reference to the Pharmacopoeia Commission for Indian Medicine :

1. It is a subordinate office under the Ministry of Health and Family Welfare
2. It is engaged in the development of Pharmacopoeial Standards for Ayurvedic, Unani, Siddha and Homoeopathic drugs
3. It acts as Central Drug Testing cum Appellate Laboratory for Indian systems of Medicine and Homoeopathy

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

EXPLANATION:

Recently, the Government of India has established Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H) as a subordinate office under Ministry of Ayush (not the Ministry of Health and Family Welfare).

Pharmacopoeia Commission of Indian Medicine and Homoeopathy (PCIM&H) is engaged in developing Pharmacopoeial Standards for Ayurvedic, Unani, Siddha and Homoeopathic drugs. **So, Statement 1 is not correct and Statement 2 is correct.**

Key fields of activity of PCIM&H are,

- Ø Development of Pharmacopoeias and Formularies
- Ø Acting as Central Drug Testing cum Appellate Laboratory for Indian systems of Medicine & Homoeopathy

So, Statement 3 is correct.

ADDITIONAL INFORMATION:

PHARMACOPOEIA COMMISSION FOR INDIAN MEDICINE

About	Ø The Commission was established as Pharmacopoeia Commission for Indian Medicine (PCIM) in 2010 as an autonomous body under the Ministry of AYUSH. Ø It was registered under Societies Registration Act 1860 in 2010.
Vision	Ø To be the Nodal Agency in establishing Quality standards for drugs of Indian Systems of Medicine and Homoeopathy.
Mission	Ø To formulate Quality standards for drugs used in Indian Systems of Medicine and Homoeopathy.
Objectives	Ø To develop Pharmacopoeias for drugs/formulations of 'Indian Medicine' and 'Homoeopathy'. Ø To develop Formularies of 'Indian Medicine'. Ø To publish compendia supplementary to Pharmacopoeias/Formularies of 'Indian Medicine' and 'Homoeopathy' and other related scientific/regulatory information pertaining to the functional area of PCIM&H. Ø To nurture and promote awareness on Quality assurance of drugs/formulations of 'Indian Medicine' and 'Homoeopathy' and drug research.

Q.85) Consider the following statements with reference to the Alluvial soils in India :

1. Khadar soils are the new alluvial deposits which are lighter in colour and have a sandy texture

2. Khadar is deposited near the riverbanks while Bhangar found away from the banks of the river on higher interfluvial zones
3. At the foothills of the Himalayas, bhabhar soils are found, which are characterized by pebbles and swamps

Which of the statements given above is/are correct ?

- (a) 1 and 3 only
- (b) 2 and 3 only
- (c) 1 only
- (d) **1, 2 and 3**

EXPLANATION:

Alluvial soils are the most important soil type found in India and are also found in the largest area. They are made up of sediments deposited by rivers in the interior parts of India while sea waves help in depositing them over the coastline.

Khadar soils are the new alluvial deposits which are lighter in colour and have a sandy texture while Bhangar soils are the older alluvium, darker in colour and possess a more clayey composition. **So, Statement 1 is correct.**

Alluvial soil



Khadar soils are deposited near the riverbanks while Bhangar soils are present in regions on higher interfluvial zones that are located beyond the floodplains and contain older alluvial soil with a higher sandy loam component. **So, Statement 2 is correct.**

Khadar and Bhangar



At the foothills of the Himalayas, bhabhar soils are found which are characterized by pebbles and swamps that may be found in the Terai region. They are made of tiny stones which get carried down from the highlands by rivers. **So, Statement 3 is correct.**

Bhabhar



ADDITIONAL INFORMATION:

SOILS

- About** Ø The loose material or the upper layer of the mantle rock consisting mainly of very small particles and humus which can support the growth of plants is known as soil.
Ø Soil mainly consists of minerals or rock particles, a certain proportion of decayed organic matter, soil water, soil air, and living organisms which exist in a complicated and dynamic relationship with each other
- Indian soils** Ø Indian soils may be classified into four categories, namely Alluvial, regur (black-earth), Red soil and lateritic soil.
Ø The Indian Council of Agricultural Research, based on texture, structure, colour, pH value, and location porosity and location has identified the following types of soil groups
- Alluvial soils
 - Ø Khadar
 - Ø Bangar
 - Red soils
 - Regur (Black-earth) soils
 - Desert soils
 - Laterite soils
 - Mountain soils
 - Red and Black soils
 - Grey and Brown soils
 - Sub montane soils
 - Snowfields

Q.86) Consider the following statements with reference to tribes of India :

1. More than half of the tribal population of India is living in multidimensional poverty.
2. Some tribes in India still follow the practice of polyandry and polygyny.
3. The state boundaries are always demarcated such that the domain of any particular tribe is located in a single state.

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

EXPLANATION:

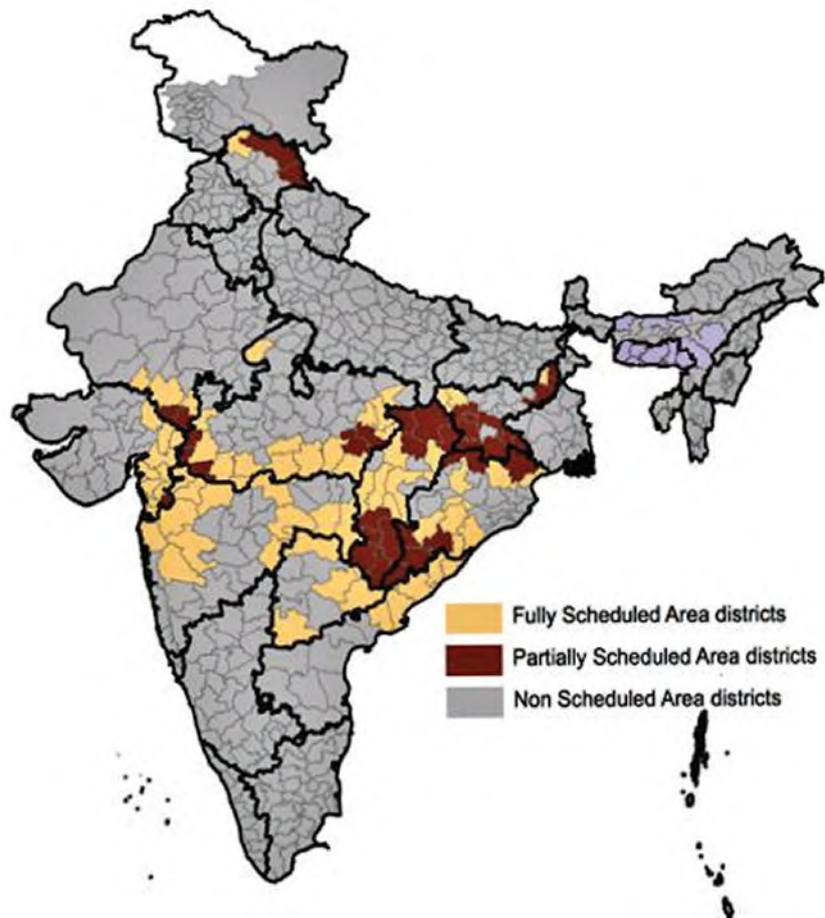
The global Multidimensional Poverty Index (MPI) was produced by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative. In India, five out of six multidimensionally poor people are from lower tribes or castes. The Scheduled Tribe group accounts for 9.4 per cent of the population and is the poorest, with 65 million of the 129 million people living in multidimensional poverty. **So, Statement 1 is correct.**

Polygyny is present among the Naga tribes and the Gond, Baiga, and Toda. It is also present among the Lushai, Juang, and Kondh tribes. Polygyny is prevalent among tribals for a variety of reasons. It is practised because of the gender imbalance, with women outnumbering men.

Polyandry is also prevalent in South India, particularly among the Todas tribes of the Nilgiris and the Nanjanad Vellala of Travancore. While many clans and tribes no longer practise polyandrous unions, it is still practised by some Paharis, particularly in the Jaunsar-Bawar region of Northern India. **So, Statement 2 is correct.**

Article 244 of the Constitution has made provision for Administration of Scheduled areas and Tribal Areas" to protect the interests of Scheduled Tribes. Land and other social issues, provisions have been enshrined in the Fifth Schedule and the Sixth Schedule of the Constitution.

- Ø The Fifth Schedule under Article 244(1) of Constitution defines "Scheduled Areas" as such areas as the President may by order declare to be Scheduled Areas.
- Ø These areas can be altered by the President of India after consultation with the Governor of that State under Article 244(2).
- Ø The state boundaries are not demarcated in a way that the domain of any particular tribe is located in a single state. Many scheduled tribes live across various state boundaries. For example the bhil tribes live in various state like Rajasthan, Madhya Pradesh, Jharkhand, Chhattisgarh etc.. **So, Statement 3 is not correct.**



Q.87) In general, a sustained Positive value of Southern Oscillation indicates :

1. Dry weather conditions in Southeast Asia
2. A warm Peru Current
3. Good Southwest Monsoon
4. A rise in depth of thermo-cline in the western half of the Pacific Ocean

Select the correct answer using the code given below?

- (a) 2 and 3 only
- (b) 1, 2 and 4 only
- (c) **3 and 4 only**
- (d) 1, 2, 3 and 4

EXPLANATION:

Changes in the pressure conditions over the Southern oceans also affect the monsoons. Normally when the tropical eastern South Pacific ocean experiences high pressure, and the tropical eastern Indian Ocean experiences low pressure.

But in certain years, there is a reversal in the pressure conditions, and the eastern Pacific has lower pressure than the eastern Indian Ocean. This periodic change in pressure conditions is known as the Southern Oscillation or SO.

In Southern oscillation cause:

- Ø Monsoon rains in India and Southeast Asia have been unusually heavy.
- Ø Winter weather in southeastern Africa is cool and wet, as is the weather in eastern Australia.

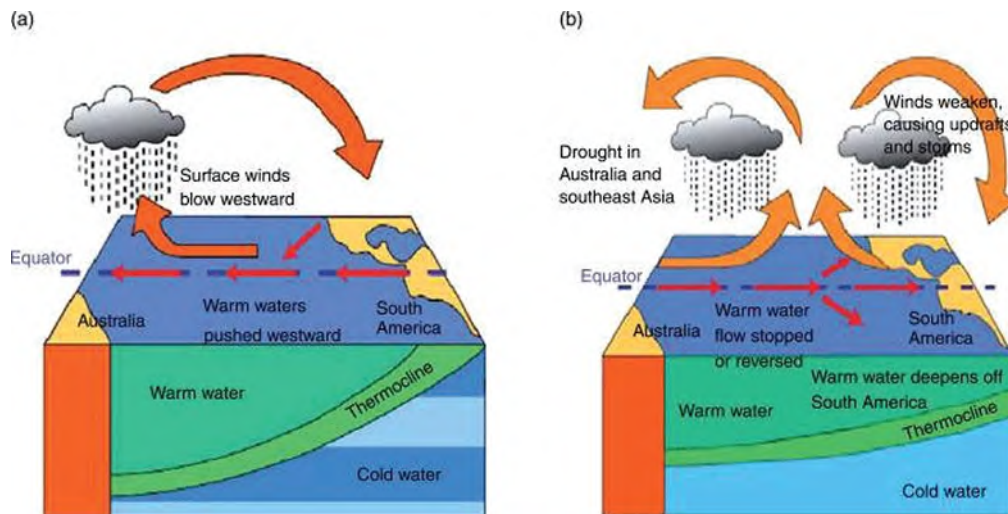
Statement 1 is not correct.

This oscillation is associated with large east-west mass shifts in the tropical atmosphere between the Indian, West Pacific, and East Pacific Ocean, usually cold waters of the Peru current. **Statement 2 is not correct.**

- Ø An ascending branch of Walker Circulation over Australia and Indonesia with its descending branch over the western side of South America (coasts of Peru and Chile).
- Ø A difference in surface pressure and temperature over the western and eastern tropical Pacific Oceans causes the Walker circulation. A pressure gradient from east to west generates an air circulation from the eastern Pacific, i.e. along the Peru-Chile coast, to the western Pacific (Australia-New Guinea). This air circulation pushes surface water towards the western Pacific, causing cold water from underneath the ocean to rise.
- Ø Such a normal condition leads to the normal south-west monsoon. **Statement 3 is correct.**

A thermocline is the transition layer between the warmer mixed water at the surface and the cooler deep water below. It is relatively easy to tell when you have reached the thermo-cline in a water body because of a sudden temperature change.

- Ø Accumulation of warm water in the western Pacific, there will be a rise in depth of thermo-cline which is balanced by the Equatorial Counter Current and high rate of evaporation. **Statement 4 is correct.**



ADDITIONAL INFORMATION:

EL NINO SOUTHERN OSCILLATION (ENSO)

- About**
 - Ø The oscillation between El Nino and La Nina is referred to as the ENSO (El Nino Southern Oscillation). ENSO oscillates erratically between El Nino and La Nina every two to seven years.
 - Ø La Nina is the polar opposite of El Nino in that it causes water off the coast of Peru to chill. During the Indian monsoon season, easterly winds intensify, and rainfall is more than typical.
- Southern Oscillation Index (SOI)**
 - Ø The Southern Oscillation Index (SOI) is a method for assessing the intensity of the Southern Oscillation.
 - Ø This is the pressure difference between Tahiti in French Polynesia (Central Pacific) and Port Darwin in northern Australia, which represents the Eastern Pacific Ocean.
 - Ø Positive and negative SOI numbers, i.e. Tahiti minus Port Darwin pressure, indicate excellent or bad rainfall in India.
- El Nio Modoki**
 - Ø El Nio Modoki is a tropical Pacific ocean-atmosphere linked phenomenon. It differs from El Nio, another linked event in the tropical Pacific.
 - Ø Conventional El Nio is distinguished by significant anomalous warming in the

eastern equatorial Pacific.

- ∅ El Nio Modoki, on the other hand, is connected with significant anomalous warming in the central tropical Pacific and cooling in the eastern and western tropical Pacific.

Q.88) Which one of the following lakes of Europe has shrunk close to record lows due to drought recently?

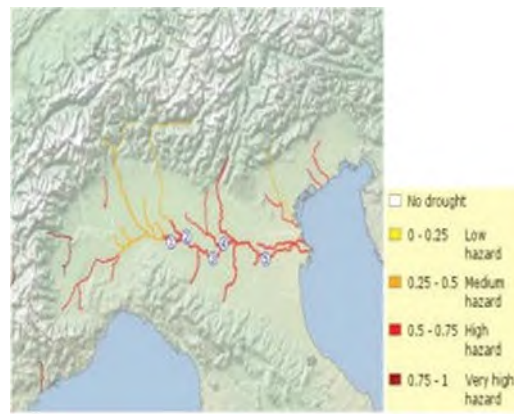
- (a) Lake Bled
- (b) Lake Lucerne
- (c) Lake Geneva
- (d) Lake Garda**

EXPLANATION:

The largest lake in Italy, Lake Garda, has been reduced to nearly its lowest level ever recorded as a result of the worst drought experienced in decades. This has exposed large areas of previously submerged rocks and caused the water to warm to temperatures that are similar to those of the Caribbean Sea. **So, Option d is correct.**

ADDITIONAL INFORMATION:

Drought in Europe and its reasons



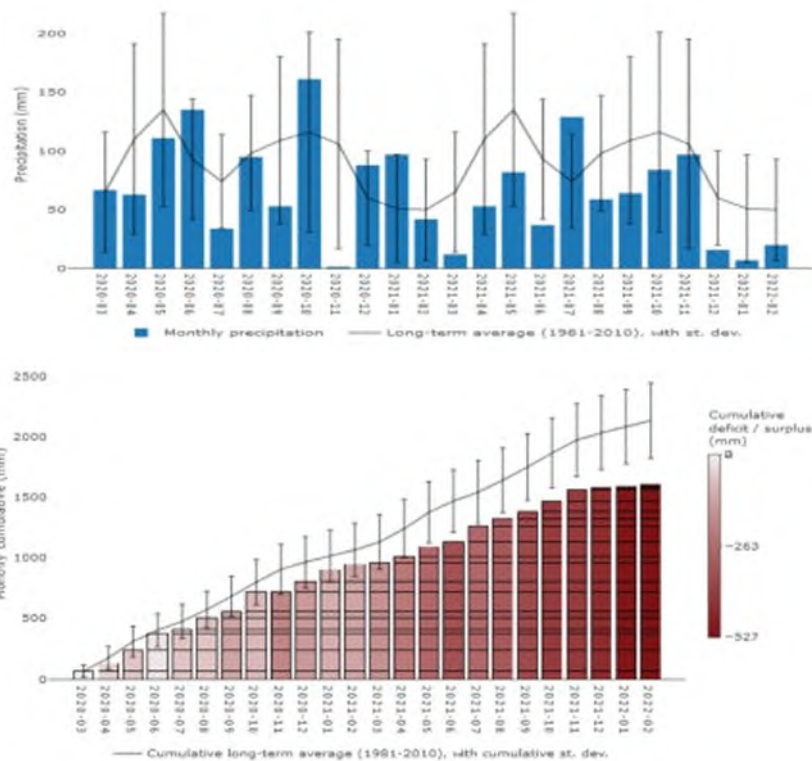
- ∅ A severe drought has been affecting northern Italy and the Po River basin in particular. Dry conditions are related to a persistent lack of precipitation since December 2021.
- ∅ The Po is an essential resource for different industries in the country – from agriculture to hydroelectric power.

Reasons:

- Prolonged heat waves
- Global warming
- Severe precipitation deficit
- Poor snow accumulation

Concerns:

- ∅ Po significantly supports Italy's water supply because it is the country's longest river.
- ∅ About 16 million individuals rely on the river to support their residential communities.
- ∅ The shrinking Po River is severely impacting Italy's ecosystem
- ∅ Drought-caused biodiversity loss can throw off an entire ecosystem, as animals rely on a balance between predators and prey to maintain their population rates.



Drought

- Ø Drought is a prolonged dry period in the natural climate cycle that can occur anywhere in the world.
- Ø It is a slow-onset disaster characterized by the lack of precipitation, resulting in a water shortage.
- Ø Drought can have a serious impact on health, agriculture, economies, energy and the environment.

Causes:

- Natural causes
- Altered weather patterns.
- Excess water demands.
- Deforestation and soil degradation.
- Global warming & Climate change.
- Fluctuating ocean and land temperatures.

Effects:

- Shortages of drinking water and poor-quality drinking water.
- Impacts on air quality, sanitation and hygiene, food and nutrition.

Q.89) Consider the following statements with reference to the Red Soils in India :

1. The texture of the soil varies from sand to clay and loam
2. In general, these soils are rich in lime, phosphate, magnesia, nitrogen, humus, and potash.
3. In Uplands, the soil is coarse and infertile, while in Plains, the soil is fine and fertile.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) **1 and 3 only**
- (d) 1, 2 and 3

EXPLANATION:

Red soils cover approximately 61 million hectares or 18.5% of the country's total area. They are mostly found over the Peninsula, from Tamil Nadu in the south to Bundelkhand in the north and from Rajmahal in the east to Kathiawad and Kutch in the west. Crystalline and metamorphic rocks such as acid granites, gneisses, and quartzites are the primary parent rocks of the red soil.

∅ Their colour is mainly red because of the presence of ferric oxides. Generally, the top layer is red, while the horizon below is yellowish in colour.

∅ Soil Texture indicates the relative content of particles of various sizes, such as sand, silt and clay, in the soil. The Red soil texture of the soil varies from sand to clay and loam. **So, Statement 1 is correct.**

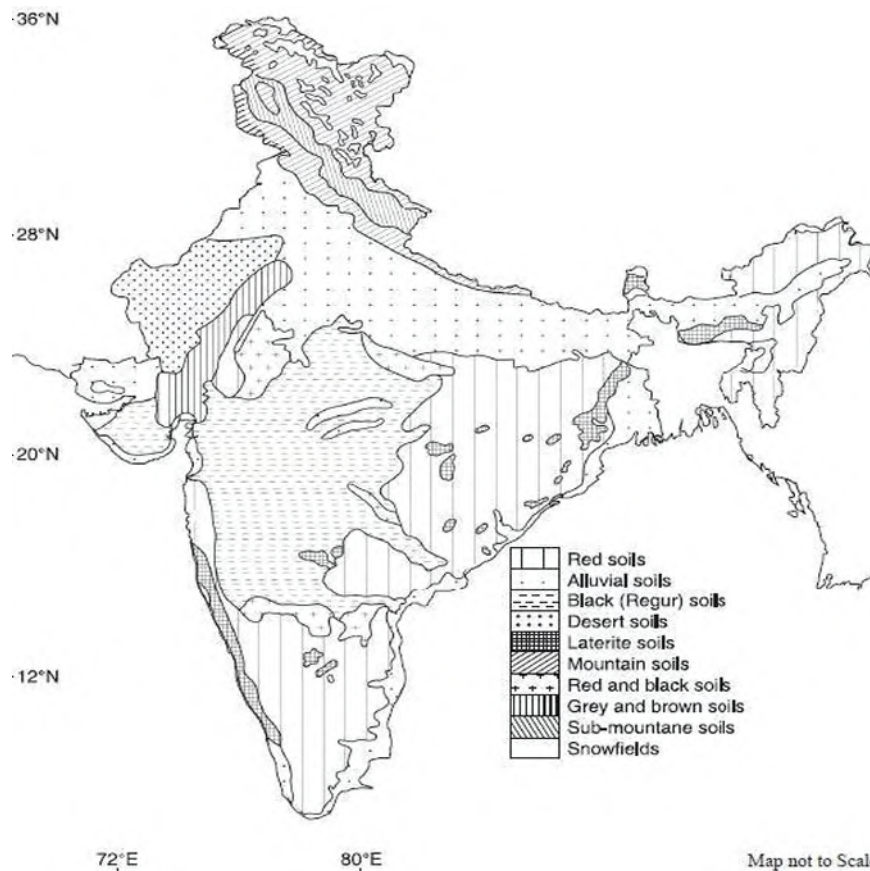
Red soils are acidic mostly due to the parent rocks' composition. The alkali content is adequate.

∅ They are deficient in calcium, magnesium, phosphates, nitrogen, and humus and high in potassium and potash. **So, Statement 2 is not correct.**

The coarse-grained red soils of the dry uplands areas are poor, gravelly, and porous—however; Fine-grained red soil in the lower areas is rich, black, and fertile. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

SOILS OF INDIA



Q.90) Consider the following statements with reference to the variability of rainfall in India :

1. The highest rainfall occurs along the Konkan and Malabar coasts
2. The highest variability is found in the areas where the average annual rainfall is the highest
3. The lowest rainfall is recorded in eastern Rajasthan, the north-eastern parts of Gujarat, and Ladakh

Which of the statements given above is/are **not** correct ?

- (a) 1 and 3 only
- (b) 2 and 3 only**
- (c) 2 only
- (d) 1, 2 and 3

EXPLANATION:

In Peninsular India, the highest rainfall occurs along the Konkan and Malabar coasts. The isohyete of 150 cm rainfall runs southwards from the Gujarat coast, roughly parallel to the crest of the Western Ghats up to Kanyakumari.

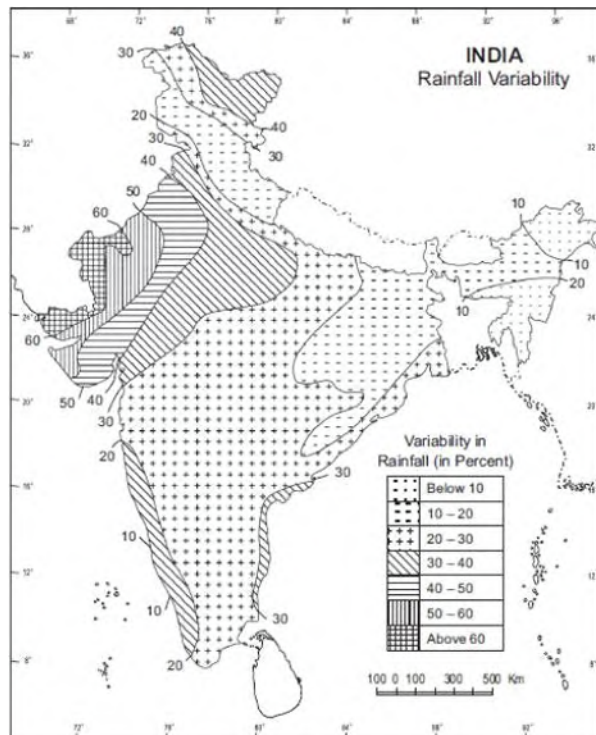
In northern India, it includes the hills of Himachal Pradesh, Uttarakhand, Chhattisgarh, eastern Maharashtra, and Northern Andhra Pradesh. **So, Statement 1 is correct.**

The highest variability is found in the areas where the average annual rainfall is the lowest. For example, the desert areas of Barmer, Ganganagar, Jaisalmer, Jodhpur, etc., have less than 20 cm of average annual rainfall. In these areas, the variability of rainfall is around 60%. **So, Statement 2 is not correct.**

The lowest rainfall is recorded in western Rajasthan, the north-western parts of Gujarat, and Ladakh, where it is less than 20 cm. The Bay of Bengal branch of the Indian monsoon has lost moisture by the time it reaches Rajasthan in northwestern India. The Arabian Sea branch of the monsoon travels parallel to the Aravalli Mountains and reaches northern India, but it does not shed precipitation across Rajasthan. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

VARIABILITY OF RAINFALL IN INDIA



Q.91) With reference to the climate of India, the retreat of Southwest Monsoon winds takes place due to :

- (a) The apparent shift of the sun from the equator towards the Tropic of cancer
- (b) The weakening of low-pressure area over the north-western parts of India**
- (c) The origin of severe cyclonic storms in the Bay of Bengal

(d) The shifting of the high-pressure area to the south Indian ocean

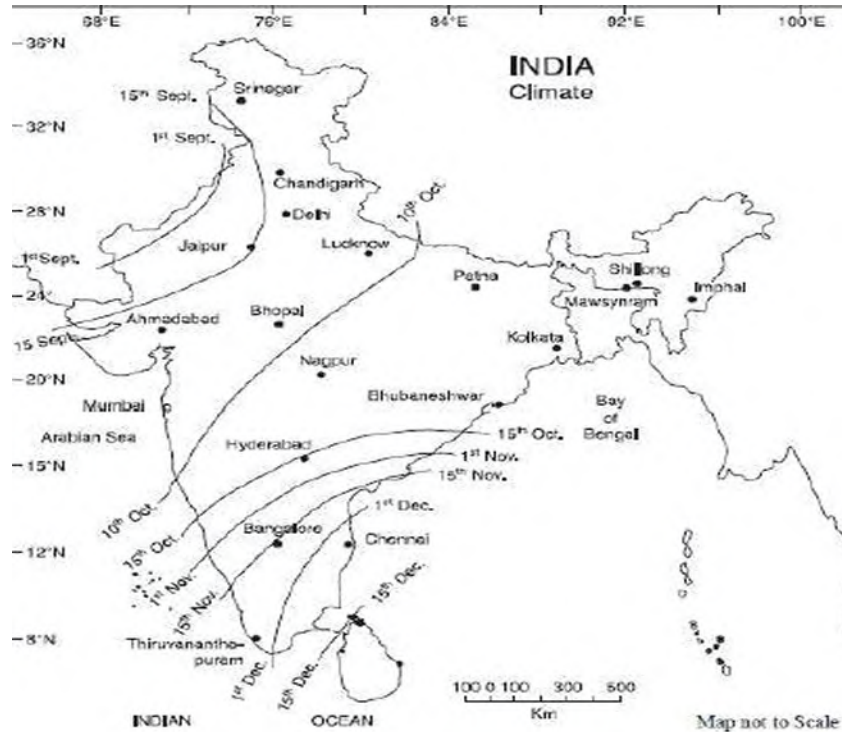
EXPLANATION:

The retreat of South-west monsoon winds is caused by the weakening of the low-pressure areas of northwestern regions. This is due to the low temperatures caused by the apparent shift of the sun towards the equator, as well as widespread rains that significantly lower temperatures. Then the low pressure area shift to the south. The changes in atmospheric pressure patterns cause the Southwest monsoons to retreat. **So, Option (b) is correct.**

ADDITIONAL INFORMATION:

RETREAT OF SOUTHWEST MONSOON

- | | |
|-------------------------------------|--|
| Conditions Of
Retreating | <ul style="list-style-type: none">∅ Clear skies and a rise in temperature signal the end of the southwest monsoon season.∅ The ground is still wet. The weather becomes unpleasant as a result of the high temperature and humidity. This is usually referred to as the 'October heat.'∅ The temperature drops dramatically in the second half of October, particularly in northern India.∅ The weather during the retreating monsoon is dry in north India but rainy in the eastern section of the Peninsula. The rainiest months in this region are October and November.∅ The widespread rain during this season is caused by the passage of cyclonic depressions that start over the Andaman Sea and manage to cross the southern Peninsula's eastern coast. These tropical cyclones are extremely dangerous.∅ These depressions and cyclones are responsible for the majority of the rainfall on the Coromandel Coast.∅ In contrast to the rest of the country, which receives rain during the southwest monsoon season from June to September, the northeast monsoon is critical for farming and water security in the south |
|-------------------------------------|--|



Q.92) Consider the following statements with reference to the postal system of India:

1. Apart from postal service, the post office network in India also provides banking and insurance services to its customers.
2. No states in India are bifurcated by the postal zones of India
3. The number of people employed by India Post is more than that employed by the Indian Armed Forces.

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

EXPLANATION:

The Indian postal network is the largest in the world. It handles parcels as well as personal written communications. It is involved in delivering mail (post), remitting money by money orders, accepting deposits under Small Savings Schemes, providing life insurance coverage under Postal Life Insurance (PLI) and Rural Postal Life Insurance (RPLI), and providing retail services like bill collection, sale of forms, etc.

They are also involved in doing banking activities by following the RBI guidelines, in this line recently opened India Post Payments Bank is an example. **So, Statement 1 is correct.**

There are nine postal zones in India, including eight regional zones and one functional zone (for the Indian Army). Each zone comprises of full few states rather than bifurcating it into many regions for the postal services. For example, Tamilnadu, Andhra, and Karnataka as a whole state in one zone (south). **So, Statement 2 is correct.**

The number of employees employed by the Indian post is only about 4,15,000 people, whereas the number of employees under the Indian Armed Forces was reported at 30,45,000 in 2019, according to the World Bank collection of development indicators, compiled from officially recognized sources. **So,**

Statement 3 is not correct.

Q.93) Consider the following pairs :

Soil Type	Crops
1. Laterite Soil	- Cashew nuts
2. Sub-montane Soil	- Rice
3. Red Soil	- Ground nut
4. Black Soil	- Cotton

How many pairs given above is/are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs**

EXPLANATION:

Laterite soils are created by the chemical breakdown of rocks primarily composed of iron oxide, giving them their typical pink or red tint.

- Ø These soils can be found in India's central, eastern, and southern regions.
- Ø These residual soils are made of basalt and have a high specific gravity.
- Ø The majority of these soils are made up of calcite depositions.
- Ø Laterite soils are suitable for growing plantation crops like tea, coffee, rubber, cinchona, coconut, areca nut, etc. and are more suited to cashew nut crops. **So, Pair 1 is correct.**

Sub-montane soil is found in the Tarai region of the sub-montane, which stretches in a narrow span from Jammu and Kashmir to Assam.

- Ø These soils were produced as a result of the deposition of eroded debris from the Shiwaliks and the Lesser Himalayas.
- Ø The soil is fertile and promotes lush forest growth.
- Ø In the sub-montane soil, the main crop is rice. **So, Pair 2 is correct.**

The Red Soil formed due to Weathering of metamorphic and igneous rocks. A high iron concentration causes the soil's red colour.

- Ø The texture of the soil varies from sandy to clayey, but it is mostly loamy. It is high in potash but low in phosphate, humus, and nitrogen.
- Ø This type of soil can be found in Tamil Nadu, Madhya Pradesh, Jharkhand, Odisha, sections of Karnataka, and southeast Maharashtra.
- Ø This soil is suitable for many crops, including wheat, tobacco, millet, oilseed, groundnut, and fruit trees. **So, Pair 3 is correct.**

Black Soil is often referred to as "Regur Soil" or "Black Cotton Soil." It accounts for around 15% of the country's overall land area.

- Ø It encompasses most of the Deccan Plateau, including parts of Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh, and some of Tamil Nadu.
- Ø The black soil is quite deep in the higher reaches of the Godavari and Krishna rivers and the northwestern part of the Deccan Plateau.
- Ø Black soils are high in iron, lime, aluminium, magnesium, and potassium; however, this soil is poor in nitrogen, phosphorus, and organic matter.
- Ø Cotton, pulses, millets, castor, tobacco, sugarcane, citrus fruits, linseed, and other crops are primarily grown in black soil. **So, Pair 4 is correct.**

Q.94) Consider the following statements :

1. Bamboos are fast-growing perennial plants
2. In India, bamboo is found naturally almost throughout the country except in the Kashmir region
3. Odisha and West Bengal account for more than 70% of the bamboo resources of the country
4. According to the India State of Forest Report 2021, Madhya Pradesh has shown the highest decrease in the bamboo-bearing area

How many statements given above is/are correct ?

- (a) Only one statement
- (b) Only two statements
- (c) **Only three statements**
- (d) All four statements

EXPLANATION:

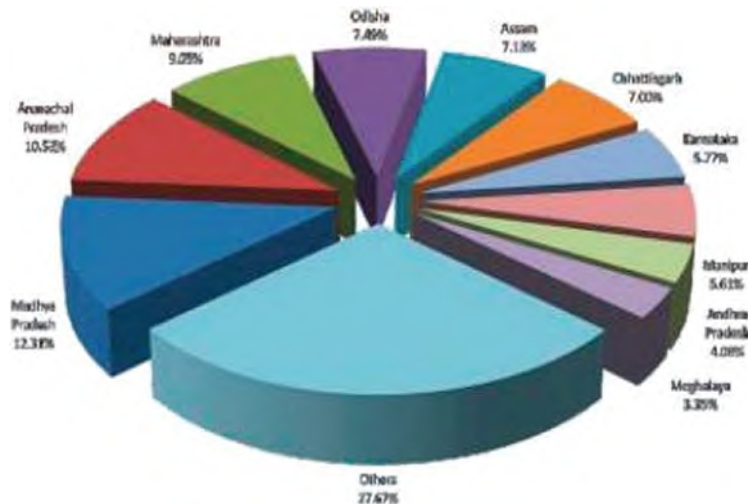
Perennial Plants that persist for many growing seasons. Generally, the top portion of the plant dies back each winter and regrows the following spring from the same root system.

Bamboo is the fastest-growing perennial plant on earth. Some species of bamboo can grow more than 1 meter per day, which is about 4 cm per hour. No other plant grows faster. Two examples of such fast-growing bamboo are Madake (*Phyllostachys reticulata*) and Moso (*Phyllostachys edulis*). **So, Statement 1 is correct.**

Bamboo grows in the tropical, subtropical, and temperate regions of the world with an uneven distribution based on annual precipitation, altitude, soil conditions, and temperature. Bamboo is found naturally almost throughout the country except in the Kashmir region in India. **So, Statement 2 is correct.**

The total bamboo-bearing area of the country has been estimated to be 15 million ha. The North Eastern states and West Bengal itself account for more than 50% of the bamboo resources in India.

Madhya Pradesh has the maximum bamboo bearing area of 1.84 m ha Followed by Arunachal Pradesh's 1.57 m ha. **So, Statement 3 is not correct.**



According to the India State of Forest Report 2021, Madhya Pradesh has shown the highest decrease of 2473 sq. km in the bamboo-bearing area followed by Maharashtra (1882 sq. km). **So, Statement 4 is correct.**

Q.95) Consider the following statements with reference to the 'School Innovation Council', which has sometimes been seen in the news recently :

1. It is a council of teachers, students, and experts from industry and academia
2. It has been introduced to all schools in all the states except Rajasthan
3. It is an initiative taken by NITI Aayog

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

EXPLANATION:

School Innovation Council is a council of teachers, students, and experts from industry and academia to conduct round-the-year activities for students and teachers on Innovation and Entrepreneurship, which will be monitored through the School Innovation Council (SIC) portal of the MIC, to record the influence at the ground level. **So, Statement 1 is correct.**

Recently, School Innovation Council (SIC) was launched by the Ministry of Education's Innovation Cell (MIC) and has been introduced to all schools in all the states, including Rajasthan.

School Innovation Council (SIC), an initiative the Ministry of Education's Innovation Cell (MIC) took, was not by the NITI Aayog. **So, Statements 2 and 3 are not correct.**

ADDITIONAL INFORMATION:

SCHOOL INNOVATION COUNCIL

- | | |
|---------------|---|
| About | <ul style="list-style-type: none"> Ø School Innovation Council aims at the culture of Ideation, Innovation & Entrepreneurship among teachers and students. Ø It has been established in schools to align with the vision of the National Education Policy (NEP) 2020 to promote ideation, out-of-box thinking, innovation, and entrepreneurship, at the school education level in a sustainable manner. |
| School | <ul style="list-style-type: none"> Ø It was launched online to strengthen teachers' mentoring capacity for cultivating |

**Innovation
Ambassador
Training
program
(SIATP)**

- and handholding innovative and ingenious ideas from students.
- Ø The Teachers will undergo 72 hours of training, and those who qualify for all modules with a minimum of 50% passing marks will be recognized as “Innovation Ambassadors.”
 - Ø It will enhance young children's skills in Ideation, Intellectual Property Rights (IPR), product development, design thinking, problem-solving, critical thinking and entrepreneurship skills.

Q.96) Which among the following are zoonotic diseases ?

1. Monkeypox
2. Lumpy skin disease
3. Rabies
4. Kyasanur Forest disease

Select the correct answer using the code given below :

- (a) 1, 2 and 3
- (b) 2, 3 and 4
- (c) **1, 3 and 4**
- (d) 1, 2 and 4

EXPLANATION:

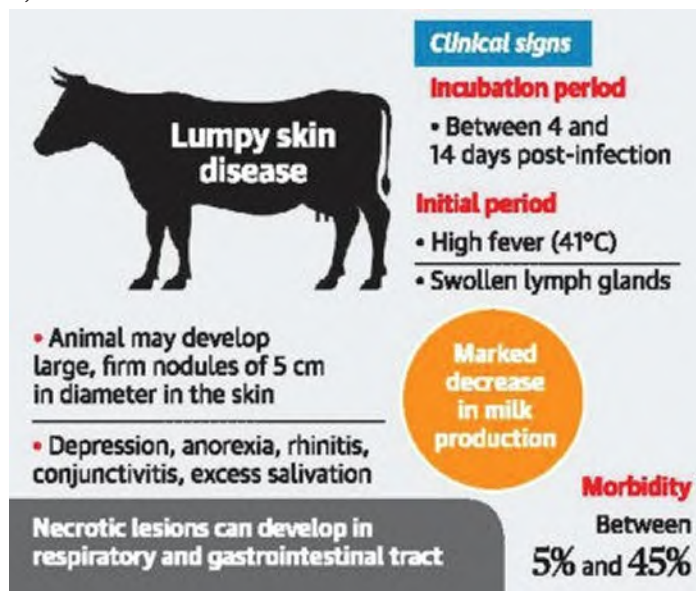
Zoonotic diseases (also known as zoonoses) are caused by germs that spread between animals and Humans. Zoonotic diseases are caused by harmful germs like viruses, bacteria, parasites, and fungi.

Monkeypox is a zoonotic disease caused by the Monkeypox virus, an *Orthopoxvirus*.

Monkeypox virus can infect mammal species, including monkeys, anteaters, hedgehogs, prairie dogs, squirrels, shrews and dogs. **So, Statement 1 is correct.**

Lumpy skin disease (LSD) is caused by a capripox virus that causes diseases in cattle and buffalo.

Lumpy skin disease virus shares antigenic similarities with the sheepox virus and the goatpox virus. It is not a zoonotic virus. **So, Statement 2 is not correct.**



Rabies is an acute viral disease, which causes encephalomyelitis in virtually all the warm-blooded animals including man. It is a zoonotic disease transmitted to other animals and to humans through close contacts with their saliva (i.e., bites, scratches, licks on broken skin and mucous membranes). **So, Statement 3 is correct.**

Kyasanur forest disease (KFD) is a rare tick-borne zoonotic disease that causes acute febrile hemorrhagic illness in humans and monkeys, especially in the southern part of India.

Kyasanur Forest disease (KFD) is caused by the Kyasanur Forest disease virus (KFDV), a member of the virus family *Flaviviridae*. So, **Statement 4 is correct.**

ADDITIONAL INFORMATION:

ZOONOTIC DISEASES

- Recently in the news, Lumpy skin disease**
- Ø The viral infection has killed nearly 75,000 cattle in India and spread to more than 10 States and UTs.
 - Ø The disease was first observed in Zambia in 1929.
 - Ø LSD affects the lymph nodes of the infected animal, causing the nodes to enlarge and appear like lumps on the skin, which is where it derives its name.
 - Ø Lumpy skin disease is caused by the lumpy skin disease virus (LSDV), which belongs to the genus capripoxvirus, a part of the poxviridae family (smallpox and monkeypox viruses are also a part of the same family).
 - Ø The LSDV shares antigenic similarities with the sheeppox virus (SPPV) and the goatpox virus (GTPV) or is similar in the immune response to those viruses.
 - Ø It is a contagious vector-borne disease spread by vectors like mosquitoes, some biting flies, and ticks and usually affects host animals like cows and water buffaloes.
- Zoonotic disease**
- Ø Animals can carry harmful germs that can spread to people and cause illnesses known as **zoonotic diseases** or zoonoses.
 - Ø It is a Vector-borne disease being bitten by a tick or an insect like a mosquito or a flea.
- Kyasanur Forest disease**
- Ø KFDV was identified in 1957 when it was isolated from a sick monkey in the Kyasanur Forest in Karnataka, India.
 - Ø Hard Ticks (*Hemaphysalis spinigera*) are the reservoir of the KFD virus.
 - Ø Rodents, shrews, and monkeys are common hosts for KFDV after being bitten by an infected tick.
 - Ø KFDV can cause epizootics with high fatality in primates.

Q.97) Consider the following statements with reference to the cold weather season in India :

1. It is characterized by land-bearing winds, dry and stable air, and clear skies.
2. There develops a low-pressure area over north India.
3. In Peninsular India, the general direction of the wind is from west to east.

Which of the statements given above is/are correct ?

- (a) 1 and 3 only
- (b) 2 and 3 only
- (c) **1 only**
- (d) 1, 2 and 3

EXPLANATION:

- Ø The cold weather season usually begins in late November in northern India. January is the coldest month over most parts of the country as the sun shines vertically over the Tropic of Capricorn in the southern hemisphere. During these months, the mean daily temperatures remain below 21°C over northern plains and northern mountain regions.
 - Ø As a result of low temperatures, a feeble high-pressure area develops over northern parts of India, and no low-pressure area is developed. This mild high pressure causes the off-shore Northeast monsoon winds.
 - Ø Their direction is westerly (blowing from west to East) owing to the relief in the Northern plains.
 - Ø These cold and dry land-bearing winds don't give rain over most parts of the country. The weather is normally marked by clear sky, low temperatures, low humidity, and feeble, stable, variable winds.
- So, Statement 1 is correct, and 2 is not correct.**

During the cold weather season in Peninsular India, the wind direction is east to west (Easterlies) (i.e.,

From the Bay of Bengal to India). Thus, it carries moisture from the Bay of Bengal and yields precipitation along southeast coastal regions. **So, the Statement 3 is not correct.**

ADDITIONAL INFORMATION:

FEATURES OF OTHER SEASONS IN INDIA

- | | |
|--|--|
| The Hot Weather Season | ∅ The main characteristic features of the hot weather season are hot and dry weather, blowing of Loo - a hot dry wind in northern plains, afternoon dust storms, sometimes causing drizzle and mild showers in Kerala (Mango showers), West Bengal, and Assam (Northwesters / Kal Baisakhi). |
| The Advancing Southwest Monsoon Season | ∅ Low-pressure conditions over northwestern parts of India and high-pressure conditions overseas.
∅ The general wind direction particularly on the Arabian Sea and the Bay of Bengal is southwest to northeast.
∅ They cause widespread rain interspersed with dry spells
∅ The onset of monsoons is in the first week of June and withdrawal by the end of September
∅ The weather is generally hot and humid during this season. |
| The Retreating Southwest Monsoon Season | ∅ The main characteristic features of retreating Southwest monsoon season are,
∅ Weakening of low-pressure area over Northwest India
∅ Fall in temperatures throughout India
∅ Shifting of the low-pressure area to the south
∅ Origin of cyclonic storms in the Bay of Bengal causing heavy rains and damage to crops and property along the eastern coast of India. |

Q.98) Consider the following pairs :

- | <i>Hydroelectric power project</i> | - | <i>Hosting River</i> |
|---|---|-----------------------------|
| 1. Maithon Dam | - | River Barakar |
| 2. Jawahar Sagar Dam | - | River Chambal |
| 3. Nagarjuna Sagar Dam | - | River Krishna |
| 4. Hirakud Dam | - | River Mahanadi |

How many pairs given above is/are correctly matched ?

- (a) One pair only
- (b) Two pairs only
- (c) Three pairs only
- (d) All four pairs**

EXPLANATION:

Maithon Dam is located on the banks of river Barakar. The Maithon Dam is 48 km from the Coal City of Dhanbad, Jharkhand. It is 15,712 ft. (4,789 m) long and 165 ft. (50 m) high. This dam was specially designed for flood control and generates 60,000 kW of electric power. **So, Pair 1 is correct.**

Jawahar Sagar Dam is located on the banks of river Chambal and 29 km upstream of Kota city in Rajasthan. **So, Pair 2 is correct.**

Nagarjuna Sagar Dam, located in Nalgonda District, is built across River Krishna, and it is the world's largest masonry dam protected with 26 gates measuring 124.663m in height. The dam has a storage capacity of nearly 11,472 million cubic meters with an irrigation capacity for 9.81 lac acres of land. **So, Pair 3 is correct.**

Hirakud Dam is built across the Mahanadi River, about 15 km from Sambalpur in Odisha. It is the

longest earthen dam in the world. **So, Pair 4 is correct.**

ADDITIONAL INFORMATION:

HYDROELECTRIC POWER PROJECT- HOSTING RIVER

About Hydroelectric power, also called hydropower, is electricity produced by generators driven by turbines that convert the potential energy of falling or fast-flowing water into mechanical energy.

Earthen dam An earth dam is built with highly compacted earth or built up by compacting successive layers of earth, using the most impervious materials to form a core and placing more permeable substances on the upstream and downstream sides.

Gravity dam ∅ A gravity dam is constructed from concrete or stone masonry and designed to hold back water by using only the weight of the material and its resistance against the foundation to oppose the horizontal pressure of water pushing against it and is designed so that each dam section is stable and independent of any other dam section.



Q.99) Consider the following statements :

1. In India, Northeast Trade winds are essentially sea-bearing winds.
2. In India, Southwest Trade winds are essentially land-bearing winds.

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

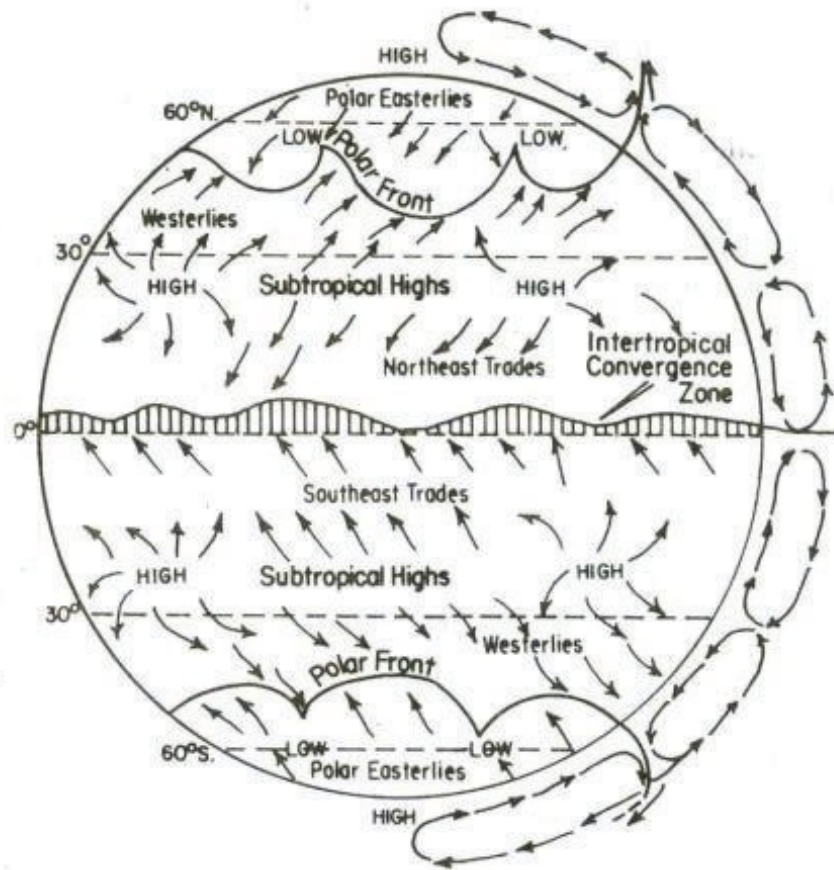
EXPLANATION:

- ∅ The cold weather season in India begins in mid-November in northern India and stays till February. During this season, the northeast trade winds prevail over the country. They blow from land to sea as land-bearing winds and hence, for most of the country, it is a dry season.
- ∅ Some amount of rainfall occurs on the Tamil Nadu coast from these winds, but from here they blow from sea to land by acting as sea bearings winds. Thus, Northeast Trade winds act both as sea bearing and land bearing winds. **So, Statement 1 is not correct.**
- ∅ The Monsoon season in India will advance by early June, as the low-pressure condition over the northern plains intensifies. It attracts the trade winds of the southern hemisphere. These southeast trade winds originate over the warm subtropical areas of the southern oceans. They cross the equator and blow in a south-westerly direction entering the Indian peninsula as the southwest monsoon.
- ∅ As these winds blow over warm oceans, they bring abundant moisture to the subcontinent by acting as sea-bearing winds (sea to land). These winds are strong and blow at an average velocity of 30 km per hour. Except for the extreme northwest, the monsoon winds cover the country for about a month. **So, Statement 2 is not correct.**

ADDITIONAL INFORMATION:

TRADE WINDS

- About**
- ∅ The winds that blow from sub-tropical high-pressure areas towards equatorial low-pressure areas are called trade or easterly winds
 - ∅ World trade has been derived from the German word 'trade' which means track. To blow trade means 'to blow steadily and constantly in the same direction.
 - ∅ Because of the Coriolis effect, the northern trade winds move away from the subtropical high in the northeast direction.
 - ∅ In the southern hemisphere the trade winds diverge out of the sub-tropical high towards the equatorial low from the southeast direction As the trade winds tend to blow mainly from the east, they are also known as the Tropical easterlies.



Q.100) Consider the following statements with reference to the urban rapid transport systems in India:

1. Urban rapid transit is usually established to provide connectivity between the suburban areas and the city.
2. At present, only state capitals in India have an operational urban rapid transport system.
3. India has more cities with an urban rapid transit system than any other South Asian Country.

Which of the statements given above is/are correct?

- (a) 1 and 2
- (b) 2 only
- (c) **3 only**
- (d) 2 and 3

EXPLANATION:

Urban rail transit in India plays an important role in intracity transportation in the major cities which are highly populated. It consists of rapid transit, suburban rail, monorail, and tram systems. That the Urban Rapid transit system is established to provide connectivity within the urban areas (Intracity). Hence, Rapid transit does not connect the suburbs and the cities. **So, Statement 1 is not correct.**

There is currently 15 operational rapid transit (popularly known as 'metro') systems in fifteen cities across India. It is present not only in a few state capitals of India but also in other cities such as Nagpur, Kanpur, Noida, etc. **So, Statement 2 is not correct.**

At present, India has 15 operational Rapid transit systems, whereas the South Asian countries whereas the country Pakistan has 4, Bangladesh has 1 under construction, and Srilanka, Nepal's rapid transit system is under proposal. **So, Statement 3 is correct.**