

Q 1.C

- Ship hulls are under continuous attack by shipworm and various marine weeds, all of which have some adverse effect on the ship, be it structurally, as in the case of the worm, or affecting speed and handling in the case of the weeds.
- Copper sheathing is the method for protecting the hull of a wooden vessel from attack by shipworm, barnacles and other marine growth through the use of copper plates affixed to the surface of the hull, below the waterline.
- **Copper has anti-bacterial properties and prevents the growth of bacteria on the ship and prevents it decay.** While other functions like providing strength etc. can be done by other metals too but preventing the growth of bacteria is the one that makes it unique for the use in boats.
- **Hence option (c) is the correct answer.**

Q 2.D

- An **autotroph** is an organism that can **produce its own food using light, water, carbon dioxide, or other chemicals.** Carbon and energy requirements of the autotrophic organism are fulfilled by photosynthesis.
- **Photosynthesis is the process by which autotrophs take in substances from the outside and convert them into stored forms of energy.** This material is taken in the form of carbon dioxide and water which is converted into carbohydrates in the presence of sunlight and chlorophyll. Carbohydrates are utilised for providing energy to the plant.
- **The carbohydrates which are not used immediately are stored in the form of starch, which serves as the internal energy reserve to be used as and when required by the plant.**
- **The following events occur during this process of photosynthesis –**
 - **Absorption of light energy by chlorophyll.**
 - **Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.**
 - **Reduction of carbon dioxide to carbohydrates.**
- These steps need not take place one after the other immediately. For example, desert plants take up carbon dioxide at night and prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day.
- **Hence option (d) is the correct answer.**

Q 3.A

- Tyndall effect is the phenomenon in which the particles in a colloid scatter the beams of light that are directed at them. This effect is exhibited by all colloidal solutions and some very fine suspensions. Therefore, it can be used to verify if a given solution is a colloid. The intensity of scattered light depends on the density of the colloidal particles as well as the frequency of the incident light.
- When a beam of light passes through a colloid, the colloidal particles present in the solution do not allow the beam to completely pass through. The light collides with the colloidal particles and is scattered (it deviates from its normal trajectory, which is a straight line). This scattering makes the path of the light beam visible, as illustrated below.
- **Examples of the Tyndall Effect**
 - Milk is a colloid that contains globules of fat and protein. When a beam of light is directed at a glass of milk, the light is scattered. This is a great example of the Tyndall effect.

- When a torch is switched on in a foggy environment, the path of the light becomes visible. In this scenario, the water droplets in the fog are responsible for the light scattering.
- Opalescent glass has a bluish appearance when viewed from the side. However, orange-colored light emerges when light is shined through the glass.
- When sunlight passes through a canopy of a dense forest. Tiny water droplets in the mist scatter light. The color of the scattered light depends on the size of the scattering particles. **Hence option (a) is the correct answer.**
- **Rayleigh scattering, named after the 19th-century British physicist Lord Rayleigh,** is the predominantly elastic scattering of light or other electromagnetic radiation by particles much smaller than the wavelength of the radiation.
- **Compton scattering, discovered by Arthur Holly Compton,** is the scattering of a high-frequency photon after an interaction with a charged particle, usually an electron. If it results in a decrease in the energy of the photon, it is called the Compton effect.
- **In physics, total internal reflection** is the phenomenon in which waves arriving at the interface from one medium to another are not refracted into the second medium but completely reflected back into the first medium.

Q 4.C

- Deficiency of one or more nutrients can cause diseases or disorders in our body. Diseases that occur due to lack of nutrients over a long period are called deficiency diseases. Deficiency of different vitamins and minerals may also result in certain diseases or disorders.
- In its more severe forms, **vitamin A deficiency contributes to blindness** by making the cornea very dry, thus damaging the retina and cornea. **Hence pair 1 is correctly matched.**
- **Scurvy is the most prominent disease linked to Vitamin C deficiency.** It denotes a heavy lack of vitamin C in the diet. Scurvy is the most prominent disease linked to Vitamin C deficiency. **Hence pair 2 is not correctly matched.**
- Vitamin D deficiency can lead to a loss of bone density, which can contribute to osteoporosis and fractures (broken bones). Severe vitamin D deficiency can also lead to other diseases. In children, it can cause rickets. Rickets is a rare disease that causes the bones to become soft and bend.
- Anaemia is a condition in which blood lacks adequate healthy red blood cells. Red blood cells carry oxygen to the body's tissues. **Iron deficiency anaemia is due to insufficient iron. Hence pair 3 is correctly matched.**
- Goiter is a condition where your thyroid gland grows larger. **Iodine deficiency is the most common cause of goiter in the world. Hence pair 4 is correctly matched.**

Table 2.3 – Some diseases/disorders caused by deficiency of vitamins and minerals

Vitamin/Mineral	Deficiency disease/disorder	Symptoms
Vitamin A	Loss of vision	Poor vision, loss of vision in darkness (night), sometimes complete loss of vision
Vitamin B1	Beriberi	Weak muscles and very little energy to work
Vitamin C	Scurvy	Bleeding gums, wounds take longer time to heal
Vitamin D	Rickets	Bones become soft and bent
Calcium	Bone and tooth decay	Weak bones, tooth decay
Iodine	Goiter	Glands in the neck appear swollen, mental disability in children
Iron	Anaemia	Weakness

Q 5.B

- **Voltmeter:**
 - Voltmeter which is also known as a voltage meter is an instrument that **measures the voltage or potential difference between two points** of an electronic or electrical circuit. Usually, the voltmeter is used for Alternating Current (AC) circuits or Direct Current (DC) circuits. Alternatively, Radio Frequency (RF) voltage can also be measured by specialized voltmeters.

- In order to measure a device's voltage, a **voltmeter is connected in parallel to a device**. This setup is important as objects in parallel usually tend to experience the same potential difference. It is connected in parallel with the circuit mainly because the same voltage drop occurs across it. **Hence statement 1 is not correct.**
- A **voltmeter also has high internal resistance**. This is done mainly because it is used in measuring the potential difference between the two points of the circuit. As such the current of the measuring device remains the same. In other words, the high resistance of the voltmeter will impede the flow of current through it. This allows the device to take correct readings of the voltage. **Hence statement 2 is correct.**

Q 6.C

- **Recently, SEBI has allowed Alternative Investment Funds (AIFs) to participate in Credit Default Swaps (CDS).** AIF refers to any privately pooled investment fund, (whether from Indian or foreign sources), in form of a trust or a company or a body corporate, or a Limited Liability Partnership (LLP).
- **CDS is a financial derivative that allows an investor to swap or offset their credit risk with that of another investor. To swap the risk of default, the lender buys a CDS from another investor who agrees to reimburse them if the borrower defaults. Hence, statement 1 is correct.**
- **Most CDS contracts are maintained via an ongoing premium payment similar to the regular premiums due on an insurance policy.** A lender who is worried about a borrower defaulting on a loan often uses a CDS to offset or swap that risk.
- Credit default swaps **played a role in both the 2008 Great Recession and the 2010 European Sovereign Debt Crisis.**
- **CDS is used for speculation, hedging, or as a form of arbitrage. Hence, statement 2 is correct.**
- **Speculation**
 - Because swaps are traded, they naturally have fluctuating market values that a CDS trader can profit from. Investors buy and sell CDSs from each other, attempting to profit from the difference in prices.
- **Hedging**
 - A credit default swap by itself is a form of hedging. A bank might purchase a CDS to hedge against the risk of the borrower defaulting. Insurance companies, pension funds, and other securities holders can purchase CDSs to hedge credit risk.
- **Arbitrage**
 - Arbitrage generally involves purchasing a security in one market and selling it in another. CDSs can be used in arbitrage—an investor can purchase a bond in one market, then buy a CDS on the same reference entity on the CDS market.

Q 7.C

- **The enzyme-linked immunosorbent assay (ELISA) is an immunological assay commonly used to measure antibodies, antigens, proteins and glycoproteins in biological samples.** Some examples include: diagnosis of HIV infection, pregnancy tests, and measurement of cytokines or soluble receptors in cell supernatant or serum.
- **Antibodies are blood proteins produced in response to a specific antigen. ELISA helps to examine the presence of antibodies in the body, in case of certain infectious diseases.**
- **Principle of ELISA:** ELISA works on the principle that specific antibodies bind the target antigen and detect the presence and quantity of antigens binding. **Performing an ELISA involves at least one antibody with specificity for a particular antigen.** In order to increase the sensitivity and precision of the assay, the plate must be coated with antibodies with high affinity. ELISA can provide a useful measurement of antigen-antibody concentration. **Hence, statement 1 is correct.**
- **Indian Council of Medical Research (ICMR)-National Institute of Virology (NIV) at Pune has developed and validated the indigenous IgG ELISA test “COVID KAVACH ELISA” for antibody detection for COVID-19.** It is an IgG Elisa-based test. This means that the test will be done to detect the Immunoglobulin G (IgG) antibody.
- The body produces Immunoglobulin M (IgM) and IgG antibodies to fight against a pathogen. The IgM antibodies are produced in four-seven days after pathogens enter the body while the IgG antibodies are produced between 10-14 days of the pathogen's appearance. **If the IgG antibody is detected, it can be concluded that the person was exposed to SARS-CoV-2. Hence, statement 2 is correct.**

Q 8.C

- Plastics are categorized into - thermoplastics and thermosetting plastics. Plastic which gets deformed easily on heating and can be bent easily are known as thermoplastics, for example: PVCs and Polythene. On the

other hand, there are some plastics which **when moulded once, can not be softened by heating** are called **thermosetting plastics**, examples are **bakelite and melamine**. Hence, **statement 1 is correct**.

- Bakelite is the commercial name for the polymer obtained by the polymerization of phenol and formaldehyde. It has **low electrical conductivity and high heat resistance**. Therefore it is a poor conductor of heat and electricity. It can be used in manufacturing **electrical switches, machine parts of electrical systems, handles of various utensils, etc.** Hence, **statement 2 is not correct and statement 3 is correct**.

Q 9.B

- A **quark** is a type of elementary particle and a fundamental constituent of matter. Quarks combine to form composite particles called **hadrons, the most stable of which are protons and neutrons, the components of atomic nuclei**.
- In particle physics, a **hadron** is a composite subatomic particle made of two or more quarks held together by a strong interaction. They are analogous to molecules that are held together by the electric force.
- Quarks are considered to be point-like entities, with zero sizes. As of 2014, experimental evidence indicates they are no bigger than 10^{-4} times the size of a proton, i.e. less than 10^{-19} meters.
- An **atom is a particle of matter** that uniquely defines a chemical element. An atom consists of a central nucleus that is surrounded by one or more negatively charged electrons. The nucleus is positively charged and contains one or more relatively heavy particles known as protons and neutrons.
- Thus, atoms consist of hadrons and hadrons are made up of quarks. **Hence option (b) is the correct answer.**

Q 10.A

- Silver articles, when exposed to air become black after some time. This is because the **silver metal reacts with sulphur present in the atmosphere and forms silver sulphide**. Thus, a layer of silver sulphide is formed on the surface of silver articles, because of which they appear dull and black.
- **Hence, option (a) is the correct answer.**

Q 11.C

- **Recent Context: The annual status of education report (ASER) 2022 has been released by NGO Pratham.**
- **Annual Status of Education Report (ASER), India's largest NGO-run annual survey, has been conducted by Pratham since 2005 to provide estimates of children's schooling status and their ability to read simple text and do basic arithmetic and evaluate the relevance and impact of its programs. Hence statement 1 is correct.**
- Findings are disseminated at national, state, district, and village levels, and influence education policies at both state and central levels.
- ASER Survey is a **household survey rather than a school-based survey. Hence statement 2 is not correct.**
 - It consists of one-on-one oral assessments.
 - It is aimed at a **representative sample of all children (whether in school or out of school)**.
 - It is **limited to rural areas of the country. Hence statement 3 is correct.**
 - It is also the only annual source of information on children's learning outcomes available in India.
- **ASER 2022 is the first field-based 'basic' nationwide ASER since 2018.** In ASER 2022, children in the age group of 3 to 16 years were surveyed to record their schooling status and assess their basic reading and arithmetic skills.
- **The Key Findings are:**
 - **Government school enrolment: The proportion of children (aged 6 to 14) enrolled in government schools increased sharply from 65.6% in 2018 to 72.9% in 2022. Hence, statement 1 is not correct.**
 - Nationally, the proportion of children in Standard I-VIII taking paid private tuition classes increased from 26.4% in 2018 to 30.5% in 2022.
 - **The enrolment rate for the 6 to 14 age group has been above 95% for the past 15 years. Despite school closures during the pandemic, overall enrolment figures have increased from 97.2% in 2018 to 98.4% in 2022. Hence, statement 2 is not correct.**
 - 2022 was the first time when the percentage of children currently not enrolled in schools dropped to 2 per cent or below. Even after prolonged school closures during the pandemic period, proportion of children not enrolled in school continued to decline between 2018 and 2022.
 - As per the ASER 2022, **there has been a record high in the number of enrollment**, reaching the highest level since the introduction of the Right to Education Act in 2009. During the pandemic there was a spike in dropout rates, which was temporary.

Q 12.D

- An indicator is a substance which changes its colour, odour, properties, etc. when it comes in contact with an acid or a base.
- **Litmus** is a natural indicator. It is a purple dye which is extracted from a type of plant called 'lichen'. **Blue litmus paper turns red** if the substance is acidic.
- **Turmeric** is an acid-base indicator. When it reacts with bases, it changes color to deep red. This red form of the indicator can **change back to yellow when acids are added**.
- **Methyl orange** is a popular pH indicator that is used in titration. The **colour of the solution turns red** when methyl orange is used as an indicator of acid.
- **Vanilla extract** has a characteristic pleasant smell. If a basic solution is added to vanilla extract, then we cannot detect the characteristic smell of vanilla extract. An **acidic solution does not destroy the smell of vanilla extract**. This can be used as a test for acids and bases by a visually impaired student.
- **Hence, option (d) is the correct answer.**

Q 13.A

- **The resistivity of alloy:**
 - The resistivity of any substance can be defined as the **electrical resistance of a conductor of a unit cross-sectional area and a unit length**. Every material has some amount of resistivity. Some have high resistivity and some have low resistivity. The more the resistivity, the less the amount of current carrying capacity by the material and the lesser the resistivity more is the current carrying capacity of the material.
 - Higher resistivity substances are insulators and lower resistivity materials are conductors.
 - **Alloys have higher resistivity** than their constituent metals because of the following reasons:
 - Alloys have high melting and boiling points.
 - **In alloys, higher resistivity is caused by** the additional scattering of electrons known as alloy scattering. **Hence statement 1 is correct.**
 - Burning or combustion always involves oxygen. Alloys do not get burnt (or get oxidized) easily. **Hence statement 2 is not correct.**
 - In fact, alloys have better properties than their constituent metals.
- Examples of alloys are Steel, Nichrome, Bronze, Brass, Duralumin, and solder. **Hence statement 3 is not correct.**

Q 14.C

- **An exothermic reaction** is a chemical reaction that **involves the release of energy in the form of heat or light**. Thus in an exothermic reaction, energy is transferred into the surroundings rather than taking energy from the surroundings as in an endothermic reaction.
- **Formation of clouds** is due to the condensation of water vapour. As **heat is released** during the conversion of gas into a liquid and from liquid to solid (snow), it is an **exothermic reaction**.
- **When liquid water is heated that means heat is taken. So, it is an endothermic reaction. Latent heat of vaporization makes heat content in the steam greater than in liquid water at 100 degree celcius.**
- The process of **rusting iron is an exothermic reaction**. It's because the rust-producing process between iron and damp air releases a lot of heat. However, the reaction normally takes place at such a sluggish rate that the release of heat is barely apparent.
- **Hence, option (c) is the correct answer.**

Q 15.C

- R.H. Whittaker (1969) proposed a Five Kingdom Classification. The kingdoms defined by him were named Monera, Protista, Fungi, Plantae and Animalia. The main criteria for classification used by him include cell structure, thallus organisation, mode of nutrition, reproduction and phylogenetic relationships.

TABLE 2.1 Characteristics of the Five Kingdoms

Characters	Five Kingdoms				
	Monera	Protista	Fungi	Plantae	Animalia
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (Polysaccharide + amino acid)	Present in some	Present (without cellulose)	Present (cellulose)	Absent
Nuclear membrane	Absent	Present	Present	Present	Present
Body organisation	Cellular	Cellular	Multicellular/ loose tissue	Tissue/ organ	Tissue/organ/ organ system
Mode of nutrition	Autotrophic (chemosynthetic and photosynthetic) and Heterotrophic (saprophytic/parasitic)	Autotrophic (Photosynthetic) and Heterotrophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

From the above figure, statement 1 is correct.

- **Bacteria are the sole members of the Kingdom Monera.** They are the most abundant micro-organisms. Bacteria occur almost everywhere. Hundreds of bacteria are present in a handful of soil. They also live in extreme habitats such as hot springs, deserts, snow and deep oceans where very few other life forms can survive. **Hence statement 2 is correct.**
- All single-celled eukaryotes are placed under Protista, but the boundaries of this kingdom are not well defined. Members of Protista are primarily aquatic. This kingdom forms a link with the others dealing with plants, animals and fungi. Being eukaryotes, the protistan cell body contains a well defined nucleus and other membrane-bound organelles. Some have flagella or cilia. Protists reproduce asexually and sexually by a process involving cell fusion and zygote formation.

Q 16.D

- In the five kingdom classification of Whittaker there is no mention of some acellular organisms like viruses and viroids, and lichens. Viruses did not find a place in classification since they are not truly 'living', if we understand living as those organisms that have a cell structure. Viruses are non-cellular organisms that are characterised by having an inert crystalline structure outside the living cell. Once they infect a cell they take over the machinery of the host cell to replicate themselves, killing the host.
- In addition to proteins, viruses also contain genetic material, that could be either RNA or DNA. Leuko virus contains both DNA and RNA. **Hence statement 1 is not correct.**
- A virus is a nucleoprotein and the genetic material is infectious. In general, viruses that infect plants have single stranded RNA and viruses that infect animals have either single or double stranded RNA or double stranded DNA. **Bacterial viruses or bacteriophages (viruses that infect the bacteria) are usually double stranded DNA viruses. Hence statement 2 is not correct.**
- Viruses cause diseases like mumps, small pox, herpes and influenza. AIDS in humans is also caused by a virus. In plants, the symptoms can be mosaic formation, leaf rolling and curling, yellowing and vein clearing, dwarfing and stunted growth.

Q 17.B

- The basic needs of all living organisms are essentially the same. They require macromolecules, such as carbohydrates, proteins and fats, and water and minerals for their growth and development.
- **The criteria for essentiality of an element are given below:**
 - The element must be absolutely necessary for supporting normal growth and reproduction. In the absence of the element the plants do not complete their life cycle or set the seeds.
 - The requirement of the element must be specific and not replaceable by another element. In other words, deficiency of any one element cannot be met by supplying some other element.
 - The element must be directly involved in the metabolism of the plant.
- Only a few elements have been found to be absolutely essential for plant growth and metabolism. These elements are further divided into two broad categories based on their quantitative requirements.

- Macronutrients are generally present in plant tissues in large amounts. The macronutrients include Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorous, Sulphur, Potassium, Calcium and Magnesium.
- **Micronutrients or trace elements, are needed in very small amounts. These include Iron, Manganese, Copper, Molybdenum, Zinc, Boron, Chlorine and Nickel. Hence, option (b) is the correct answer.**
- In addition to the 17 essential elements named above, there are some beneficial elements such as Sodium, Silicon, Cobalt and Selenium. They are required by higher plants.
- **Role of Macro and Micro-nutrients:** Essential elements perform several functions. They participate in various metabolic processes in the plant cells such as permeability of cell membrane, maintenance of osmotic concentration of cell sap, electron- transport systems, buffering action, enzymatic activity and act as major constituents of macromolecules and co-enzymes.

Q 18.B

- **Recently, the Prime Minister of India flagged off the world's longest river cruise from Varanasi to Dibrugarh via Bangladesh carrying 32 Swiss tourists which will reach Dibrugarh after 50 days covering more than 3,200 km.**
- It will cost \$300 a day per passenger and this fare is same for Indians and foreigners.
- **MV Ganga Vilas, the privately-operated luxurious three-deck cruise ship** measuring 62 metres in length and 12 metres in width.
- **Hence option (b) is the correct answer.**

Q 19.B

- **Recent Context:** The Bihar government recently launched the caste survey which aims to compile data on each family digitally through a mobile application from the panchayat to the district level.
 - However, pleas were submitted to quash the notification on the ground that the caste-based census “violated the basic structure of the Constitution”
 - Supreme Court refused to entertain the petitions and asked the petitioners to approach the high court.
- **About Caste Census**
 - The caste census is the caste-wise tabulation of the population in the census exercise.
 - **The first census in India began in 1872 and the periodic count in 1881 under British rule. Since then, the data on caste was always included, though only till 1931. Hence statement 1 is not correct.**
 - Ever since independence, the Census had only the data related to SC and ST populations.
 - **The caste census is under the administrative control of the Ministry of Home Affairs. Hence statement 2 is correct.**
 - Earlier in 2011 attempt was made to Caste Census by conducting the Socio-Economic and Caste Census (SECC). Rohini Commission was another attempt at categorization within OBCs for better-targeted service delivery.

Q 20.D

- The human eye is like a camera. **Its lens system forms an image on a light-sensitive screen called the retina. Hence pair 3 is correctly matched.**
- Light enters the eye through a thin membrane called the cornea. It forms the transparent bulge on the front surface of the eyeball as shown in fig. The eyeball is approximately spherical in shape with a diameter of about 2.3 cm. **Most of the refraction of the light rays entering the eye occurs at the outer surface of the cornea.** The crystalline lens merely provides the finer adjustment of the focal length required to focus objects at different distances on the retina. **Hence pair 1 is correctly matched.**
- The structure behind the cornea is called Iris. Iris is a dark muscular diaphragm that controls the size of the pupil.
- **The pupil regulates and controls the amount of light entering eye. Hence pair w is correctly matched.**

Q 21.A

- An RNA vaccine is when a vaccine is made up of messenger RNA that will cause the body's immune system to respond to a particular virus. A DNA vaccine is when a vaccine consists of the DNA of a pathogen that will trigger an immune response.
- **RNA Vaccines:** RNA vaccines are derived from the mRNA of viruses, via a process of genetic engineering. **The RNA vaccine is carried in the form of a liquid nanoparticle that consists of lipids.**
- **The idea behind an RNA vaccine is to trigger an immune response in which T lymphocytes are activated and a response is mounted against the particular viral disease.** The mRNA sequence is that

which codes for an antigen of the illness; an antigen is a protein that the immune system will then recognize as foreign. Antibodies will then be manufactured by the body in response to this antigen.

- **Advantages: The genetic code is already in a transcribed form for protein synthesis in the case of these vaccines. RNA vaccines are also believed by many scientists to be less risky than DNA vaccines since they would not affect the host's DNA or even have to enter the nucleus of a host cell because the mRNA has already been formed. This also means the process of making antibodies is faster. Hence, statement 2 is not correct.**
- **Disadvantages:** The technology is fairly new and relies on nanotechnology, and so far none of these have been approved by the FDA for use in people. A further disadvantage is that since only a part of the viral mRNA can be used, the immune response that is activated may not be very strong. This would mean a person would need to get boosters every so often to maintain a high level of immunity. **RNA degradation is a concern and thus more engineering is needed with substances added to protect the RNA and allow storage. Comparatively, DNA vaccines are safe, easy, affordable to produce, and, unlike RNA vaccines, are stable at room temperature. Hence, statement 1 is correct.**
- **DNA vaccine:** It uses a **genetically altered plasmid which contains a piece of DNA from a virus in order to activate an immune response.** The vaccine is made using DNA from a virus, which codes for an antigen. The antigen then elicits the formation of antibodies by the person's body, which helps in the event of exposure to the virus that the particular DNA vaccine is designed for.
- **How it works:** A plasmid is used and modified to carry DNA of a virus. The plasmid is circular DNA from a prokaryotic bacterial cell, which is used in genetic engineering in molecular biology. The plasmid is inserted into the person when they are vaccinated.
- **Advantages:** Scientists have more knowledge and experience working with plasmids, so the process is somewhat easier compared with the nanotechnology involved in RNA vaccines. **DNA is also less susceptible to degradation and more stable in a lab setting compared with RNA.** This makes it easier and requires fewer steps for extraction and storage of the DNA compared with RNA.
- **Disadvantages:** Unlike an RNA vaccine, with which it may be confused, a DNA vaccine only contains DNA. This means an extra step is needed for making the antigen since mRNA has to first be transcribed in the nucleus from the DNA. This means it would take longer for the antibody response to be triggered.
- **DNA vaccines have been investigated for use to treat the following illnesses: malaria, typhoid, dengue, TB, and cancer. At the current time, DNA vaccines have not been approved for use in humans, although some have been approved for use in animals.**

Q 22.B

- **Magnetic field:**
 - The magnetic field is a quantity that has both direction and magnitude.
 - The direction of the magnetic field is taken to be the direction in which the north pole of the compass needle moves inside it. Therefore it is taken by convention that the field lines emerge from the north pole and merge at the south pole.
 - Inside the magnet, the direction of field lines is from its south pole to its north pole. Thus the magnetic field lines are closed curves. **Hence statement 1 is not correct.**
 - The relative strength of the magnetic field is shown by the degree of closeness of the field lines. The field is stronger, that is, the force acting on the pole of another magnet placed is greater where the field lines are crowded. **Hence statement 2 is correct.**
 - No two field lines are found to cross each other. If they did, it would mean that at the point of intersection, the compass needle would point in two directions, which is not possible. **Hence statement 3 is correct.**

Q 23.A

- **Bhopal Declaration was released after Think20 (T20) meeting, official engagement group of G20 which brings together leading think tanks and research centers worldwide.**
- **The importance of localization in achieving G-20 sustainable development goals has been acknowledged in the Bhopal Declaration. Eminent speakers said that triangular cooperation of government, society, and private organizations is necessary to achieve this goal. All the prominent speakers also acknowledged that India is doing important work in triangular cooperation and we can change the global scenario with this Indian model. The forum also covered India's crucial contribution to the containment of COVID-19 and its response to Russia-Ukraine war.**
- **Key highlights of Bhopal Declaration**

- **Appeal to all stakeholders to focus more on inclusive development care for welfare of every section of society in comparison to GDP. Hence, option (a) is the correct answer.**
- Encourage model of development led by women.
- Bridge the gap between North and South.
- **Promoting traditional medicine systems like AYUSH.**
- Encouraging value-oriented development in infrastructure development.
- **Work together to ensure the health for all.**

Q 24.C

- **Most plants have roots, stems and leaves. These are called the vegetative parts of a plant.** There are several ways by which plants produce their offspring. These are categorised into two types: (i) asexual, and (ii) sexual reproduction. **In asexual reproduction plants can give rise to new plants without seeds, whereas in sexual reproduction, new plants are obtained from seeds.**
- **Vegetative propagation**
 - It is a type of asexual reproduction in which **new plants are produced from roots, stems, leaves and buds.**
 - Since reproduction is through the vegetative parts of the plant, it is known as vegetative propagation.
 - **For example- potato, Ginger, Sweet potato. Hence pair 1 is correctly matched.**
- **Budding**
 - It is an asexual reproduction method in which a **new organism develops from a bud of an existing organism.**
 - Until the new organism matures, it remains attached to the parent organism.
 - The newly developed organism remains attached as it grows further. It is separated from the parent organism when it gets matured by leaving scar tissues behind.
 - **As this is asexual reproduction, the newly developed organism is a replica of the parent and is genetically identical. Bacteria, yeast, corals, flatworms, Jellyfish and sea anemones are some animal species which reproduce through budding.**
- **Fragmentation**
 - It is a form of asexual reproduction or cloning, where an organism is split into fragments.
 - Each of these fragments develops into mature, fully grown individuals that are clones of the original organism.
 - **When water and nutrients are available algae grow and multiply rapidly by fragmentation.**
 - **An alga breaks up into two or more fragments. These fragments or pieces grow into new individuals. This process continues and they cover a large area in a short period of time. Hence pair 3 is not correctly matched.**
- **Pollination**
 - Generally, pollen grains have a tough protective coat which prevents them from drying up.
 - **Since pollen grains are light, they can be carried by wind or water.**
 - Insects visit flowers and carry away pollen on their bodies. Some of the pollen lands on the stigma of a flower of the same kind.
 - The transfer of pollen from the anther to the stigma of a flower is called pollination.
 - **If the pollen lands on the stigma of the same flower or another flower of the same plant, it is called self-pollination. When the pollen of a flower lands on the stigma of a flower of a different plant of the same kind, it is called cross-pollination.**
 - **Tomatoes are self-pollinating, meaning they have flowers that contain both the male and female parts, so more than one plant is not needed for reproduction. Hence pair 2 is correctly matched.**

Q 25.A

- For plants, the soil is the nearest and richest source of raw materials like nitrogen, phosphorus and other minerals. The absorption of these substances therefore occurs through the part in contact with the soil, namely roots.
- Plants do not move, and plant bodies have a large proportion of dead cells in many tissues. As a result, plants have low energy needs, and can use relatively slow transport systems. The distances over which transport systems have to operate, however, can be very large in plants such as very tall trees. **Plant transport systems will move energy stores from leaves and raw materials from roots. These two pathways are constructed as independently organised conducting tubes, xylem and phloem.**
- The xylem and the phloem make up the vascular tissue of a plant and transports water, sugars, and other important substances around a plant. What is commonly referred to as ‘sap’ is indeed the substances that are being transported around a plant by its xylem and phloem.

- **One, the xylem moves water and minerals obtained from the soil. The other, phloem transports products of photosynthesis from the leaves where they are synthesised to other parts of the plant.**
- The xylem is responsible for keeping a plant hydrated. **Xylem sap travels upwards and has to overcome serious gravitational forces to deliver water to a plant's upper extremities, especially in tall trees. Hence, statement 1 is not correct.**
- **The phloem carries important sugars, organic compounds, and minerals around a plant. Sap within the phloem simply travels by diffusion between cells and works its way from leaves down to the roots with help from gravity. Hence, statement 2 is not correct.**
- In xylem tissue, vessels and tracheids of the roots, stems and leaves are interconnected to form a continuous system of water-conducting channels reaching all parts of the plant. **At the roots, cells in contact with the soil actively take up ions. This creates a difference in the concentration of these ions between the root and the soil. Water, therefore, moves into the root from the soil to eliminate this difference.** This means that there is steady movement of water into root xylem, creating a column of water that is steadily pushed upwards.
- **Transpiration is a process that involves loss of water vapour through the stomata of plants. The loss of water vapour from the plant cools the plant down when the weather is very hot, and water from the stem and roots moves upwards or is 'pulled' into the leaves.** Transpiration also provides the driving force for transport of water and nutrients from roots to shoots. **Hence, statement 3 is correct.**

Q 26.A

- Valence electrons are the s and p electrons in the outermost shell. The electrons present in the inner shell are core electrons. Valence electrons are responsible for the interaction between atoms and the formation of chemical bonds.
- Only the electrons present in the outermost shell can participate in the formation of a chemical bond or a molecule. Such a type of electron is called a valence electron.
- The valence electrons are part of most chemical reactions because they contain more energy compared to the electrons present in inner orbits. Meanwhile, the number of valence electrons present also helps us determine a specific element's chemical properties, such as its valence or valency, and the formation of bonds with other elements. It also gives us an idea of how readily the atoms can form bonds, the number of unpaired electrons, and how many atoms can take part.
- **Hence, option (a) is the correct answer.**

Q 27.C

- **3D printing**
 - 3D printing is the automated process of building a three-dimensional object by adding material rather than taking material away (as in drilling or machining).
 - To create a 3D-printed object, one uses an “additive process”. The three-dimensional object is created by laying down successive layers of material until the object is finished.
- **Limitations of 3D printing**
 - Although it is already deeply implemented in the world of prototyping, 3D printing is still some years away from having a breakthrough in the world of manufacturing. This breakthrough would allow 3D printing to spread from just prototyping, with the exception of select components already being manufactured by 3D printers, to be widely implemented in everyday manufacturing processes all over the world.
 - The main aspect keeping this from happening sooner is the relatively long time it takes to 3D print something that can just as well be manufactured using traditional methods (and we all know that time means money).
 - 3D printing is also limited by the size of the 3D printer. Although there are some pretty big units of 3D printing with cement, for example, high-quality and precision parts are limited to smaller machines which can also be very expensive depending on what they are designed to be capable of.
 - Another limitation is the fact that most 3D printers can only print in one material at a time. Multi-material 3D printers do exist, though, but are not very common yet.
- **The difference between 3D printing and additive manufacturing**
 - The term “3D printing” comes from the use of inkjet printer heads (in the first 3D printers) to deposit, either layer of UV-curable photopolymer resin or a binding material onto a layer of powder in a powder bed process. However, the term now universally encompasses all additive manufacturing technologies.
 - The more technical, or correct, way of referring to the automated process of building a 3D object from scratch using a digital file is “additive manufacturing”.

- **The difference between 3D printing and 4D printing**
 - 4D printing is a subset of 3D printing. In “normal” 3D printing, the end product is static, unless some flexible material is used, and it is meant to stay in that form. 4D printing is a way of “programming” the material/object to change form or functionality when given the correct impulse.
 - 4D printing provides printed objects with the ability to change form or function with time according to various stimuli such as heat, water, current, or light. **Hence, statement 2 is correct.**
 - The essential difference between 4D printing and 3D printing is the addition of smart design or responsive materials that cause time-dependent deformations of objects.
 - 3D Printing is about repeating a 2D structure, layer by layer in a print path, from the bottom to the top, layer by layer until a 3D volume is created. **Hence, statement 1 is correct.**
 - **4D Printing is referred to as 3D printing transformed over time.** Thus, a fourth dimension is added: time. So, the big breakthrough of 4D Printing over 3D Printing technology is its ability to change shape over time.
 - A 4D-printed gripper grabs an object when the temperature is optimal. A 4D-printed object is printed just like any 3D-printed shape. The difference is that the 4D Printing technology uses programmable and advanced materials that perform a different functionality by adding hot water, light, or heat. That’s why a non-living object can change its 3D shape and behavior over time.

Q 28.B

- **Recently, NASA's James Webb telescope has found a star formation (Called NGC 346) in a dynamic cluster that lies within Small Magellanic Cloud (SMC).**
- **Magellanic clouds are visible to the naked eye from southern hemisphere. But they cannot be observed from most northern latitudes. Hence statement 1 is correct.**
- **The Milky Way has a number of satellite galaxies, but the biggest one is the Large Magellanic Cloud. It is about 163,000 light-years away and around 1/100th the size of the Milky Way.** These companion galaxies were named for the Portuguese navigator Ferdinand Magellan, whose crew discovered them during the first voyage around the world (1519–22). **The Magellanic Clouds were recognized early in the 20th century as companion objects to the Milky Way Galaxy. When American astronomer Edwin Hubble established the extragalactic nature of what are now called galaxies, it became plain that the Magellanic Clouds had to be separate systems. Hence, statement 2 is not correct.**
- Unlike our spiral galaxy, this one lacks a clean spiral shape. Some scientists think that is because the Milky Way and other galaxies are pulling and warping it. **The Magellanic Clouds were formed at about the same time as the Milky Way Galaxy, approximately 13 billion years ago.** They are presently captured in orbits around the Milky Way Galaxy and have experienced several tidal encounters with each other and with the Galaxy. They contain numerous young stars and star clusters, as well as some much older stars.
- **The Magellanic Clouds serve as excellent laboratories for the study of very active stellar formation and evolution.** For example, the Tarantula Nebula (also called 30 Doradus) is an immense ionized-hydrogen region that contains many young, hot stars. The total mass of 30 Doradus is about one million solar masses, and its diameter is 550 light-years, making it the largest region of ionized gas in the entire Local Group of galaxies. **With the Hubble Space Telescope it is possible for astronomers to study the kinds of stars, star clusters, and nebulae that previously could be observed in great detail only in the Milky Way Galaxy. Hence, statement 3 is correct.**

Q 29.A

- Plant growth regulators (PGRs) are small, simple molecules of diverse chemical composition. The PGRs can be broadly divided into two groups based on their functions in a living plant body. One group of PGRs are involved in growth promoting activities, such as cell division, cell enlargement, pattern formation, tropic growth, flowering, fruiting and seed formation. These are also called plant growth promoters, e.g., auxins, gibberellins and cytokinins.
- The PGRs of the other group play an important role in plant responses to wounds and stresses of biotic and abiotic origin. They are also involved in various growth inhibiting activities such as dormancy and abscission. The PGR abscisic acid belongs to this group. The gaseous PGR, ethylene, could fit either of the groups, but it is largely an inhibitor of growth activities.
- Abscisic acid (ABA) was discovered for its role in regulating abscission and dormancy. But like other PGRs, it also has other wide ranging effects on plant growth and development. **It acts as a general plant growth inhibitor and an inhibitor of plant metabolism.** ABA inhibits seed germination. ABA stimulates the closure of stomata in the epidermis and increases the tolerance of plants to various kinds of stresses.

Therefore, it is also called the stress hormone. ABA plays an important role in seed development, maturation and dormancy. By inducing dormancy, ABA helps seeds to withstand desiccation and other factors unfavourable for growth. In most situations, ABA acts as an antagonist to GAs.

- **Hence option (a) is the correct answer.**

Q 30.B

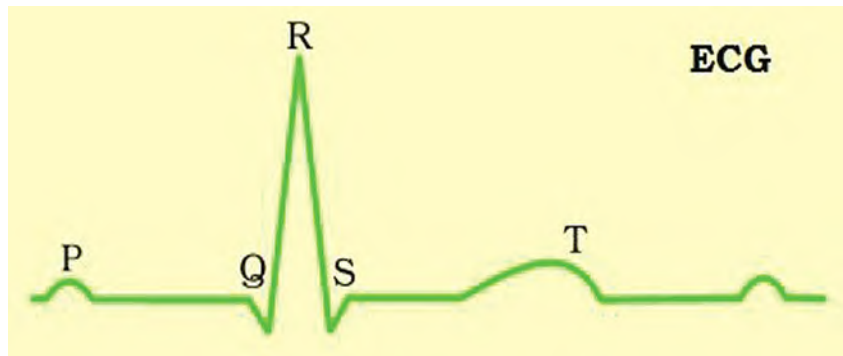
- **The boiling point of water decreases with a decrease in pressure and increases with an increase in pressure.** Food is cooked in less time in a pressure cooker because the pressure increases inside the cooker which also increases the boiling point of water (the boiling point of water now becomes 120 degrees C as opposed to 100 degrees C attained in open vessels).
- **More heat is required to reach the boiling point which is sufficient to cook food in a reduced time.**
- **Hence, option (b) is the correct answer.**

Q 31.D

- **Light can be described both as a wave and as a particle.** Wave-particle duality is a theory that describes that light has both wave and particle nature. The key difference between the wave and particle nature of light is that the wave nature of light explains that light can behave as an electromagnetic wave, whereas the particle nature of light explains that light consists of particles called photons.
- The wave nature of light shows up in the phenomena of interference, diffraction, and polarisation. On the other hand, in the photoelectric effect and Compton effect which involve energy and momentum transfer, radiation behaves as if it is made up of a bunch of particles – the photon.
- **Photo-electric effect:**
 - The emission of free electrons from a metal surface when light is shone on it, is called photoemission or the photoelectric effect. This effect led to the conclusion that light is made up of packets or quantum of energy. This strongly supported the particle nature of light and these particles were named photons. Thus, the wave-particle duality of light came into the picture.
 - **Hence option (d) is the correct answer.**

Q 32.D

- **Electro-cardiograph is used to obtain an electrocardiogram (ECG). ECG is a graphical representation of the electrical activity of the heart during a cardiac cycle.**
- To obtain a standard ECG, a patient is connected to the machine with three electrical leads (one to each wrist and to the left ankle) that continuously monitor the heart activity.
- For a detailed evaluation of the heart's function, multiple leads are attached to the chest region.
- **Each peak in the ECG is identified with a letter from P to T that corresponds to a specific electrical activity of the heart.**
- **The P-wave represents the electrical excitation (or depolarisation) of the atria, which leads to the contraction of both the atria. Hence, statement 1 is not correct.**
- **The QRS complex represents the depolarisation of the ventricles, which initiates the ventricular contraction. The contraction starts shortly after Q and marks the beginning of the systole. Hence, statement 2 is correct.**
- **The T-wave represents the return of the ventricles from excited to normal state (repolarization). The end of the T-wave marks the end of systole. Hence, statement 3 is not correct.**
- **By counting the number of QRS complexes that occur in a given time period, one can determine the heart beat rate of an individual.**
- Since the ECGs obtained from different individuals have roughly the same shape for a given lead configuration, any deviation from this shape indicates a possible abnormality or disease. Hence, it is of a great clinical significance.



Q 33.B

- **National Financial Reporting Authority (NFRA) has published draft requirements for auditors to prepare and publish annual transparency reports to increase transparency in management and governance of audit firms.**
- NFRA was constituted in 2018 under section 132(1) of **Companies Act, 2013**. It consists of a chairperson who will be appointed by Central Government and a maximum of 15 members. **Hence, statement 1 is not correct.**
- **The duties of the NFRA are to:**
 - **Recommend accounting and auditing policies and standards to be adopted by companies for approval by the Central Government;**
 - Monitor and enforce compliance with accounting standards and auditing standards;
 - Oversee the quality of service of the professions associated with ensuring compliance with such standards and suggest measures for
 - **Improvement in the quality of service;**
 - Perform such other functions and duties as may be necessary or incidental to the aforesaid functions and duties.
- **It is an independent regulator to oversee auditing profession and accounting standards** with jurisdiction extending to all listed companies and large unlisted companies. **Hence, statement 2 is correct.**
- **It has same powers as a civil court while trying a suit. Hence, statement 3 is not correct.**
- Sub Rule (1) of Rule 4 of the NFRA Rules, 2018 , provides that the Authority shall protect the public interest and the interests of investors, creditors and others associated with the companies or bodies corporate governed under Rule 3 by establishing high quality standards of accounting and auditing and exercising effective oversight of accounting functions performed by the companies and bodies corporate and auditing functions performed by auditors.

Q 34.C

- **There is air trapped in between the wool fibers in case of combined blankets.** Hence air together with wool conducts less heat through the blanket as this air prevents the flow of heat from our body to the cold surroundings. Such is not the case with a single blanket.
- **Hence option (c) is the correct answer.**

Q 35.B

- **A sound wave is a vibration** that is transmitted through a medium, such as air, water, and metals. Ultrasonic wave (or ultrasound) is defined as “inaudible sound with high frequency for humans” the frequency of which generally exceeds 20 kHz. Ultrasound is sound waves with frequencies higher than the upper audible limit of human hearing.
- **The following technologies are based on ultrasound waves:**
 - **Echocardiography (ECHO):** It is **used to examine the heart**. It is a safe and noninvasive technique. Echocardiography can be used to detect whether the heart muscle is moving normally and how much blood the heart is pumping out with each beat. This procedure can also detect abnormalities in the heart's structure, such as defective heart valves, birth defects (such as holes in the walls between the heart's chambers), and enlargement of the heart's walls or chambers, as occurs in people with high blood pressure, heart failure, or impairment of the heart's muscular walls (cardiomyopathy). **Hence option 2 is correct.**
 - **Ultrasound scanner:** An ultrasound scan is **used to examine internal body structures**. Ultrasound imaging sends out (emits) high-frequency sound waves, directed at the tissue being examined, and records the reflected sound or echoes to create an image. An ultrasound scan is generally non-invasive.
 - **Ultrasonography:** It uses high-frequency sound (ultrasound) waves to produce images of internal organs and other tissues. A device called a transducer converts electrical current into sound waves, which are sent into the body's tissues. Sound waves bounce off structures in the body and are reflected back to the transducer, which converts the waves into electrical signals. A computer converts the pattern of electrical signals into an image, which is displayed on a monitor and recorded as a digital computer image. No x-rays are used, so there is no radiation exposure during ultrasonography. So, it is **used for the examination of the fetus during pregnancy. Hence option 1 is correct.**
- **RADAR: The term RADAR was coined in 1940 by the United States Navy as an acronym for radio detection and ranging.** Radar is a radiolocation system that uses **radio waves (and not sound waves)** to determine the distance (ranging), angle, and radial velocity of objects relative to the site. It is used to detect and track aircraft, ships, spacecraft, guided missiles, and motor vehicles, and map weather formations, and

terrain. A radar system consists of a transmitter producing electromagnetic waves in the radio or microwave domain, a transmitting antenna, a receiving antenna (often the same antenna is used for transmitting and receiving), and a receiver and processor to determine the properties of the objects. **Hence option 3 is not correct.**

Q 36.A

- A Lagrangian point is a position or location in space where the combined gravitational forces of two large bodies is equal to the centrifugal force that is felt by a third body which is relatively smaller. **A Lagrangian point is also known as a Lagrange point, Liberation point, or L-point. These points are locations in an orbital arrangement of two large bodies where a third smaller body, affected solely by gravity, is capable of maintaining a stable position relative to the two larger bodies. Hence option (a) is the correct answer.**
- In the Sun-Earth system, the first point (L1) lies between the Sun and Earth and the second point (L2) lies in the opposite direction of the Sun, with both L1 and L2 at a distance of about 1 million miles from the Earth. The third point (L3) lies opposite the orbit of the Earth behind the Sun. All of these three points are unstable.
- The fourth and fifth points, i.e. L4 and L5, lie along the orbit of Earth, with one being ahead of it and the other behind it, at an angle of 60 degrees. Points L4 and L5, unlike L1, L2 and L3, are stable points. In the Aditya - L1 mission, the first Indian mission to study the Sun, a satellite will be placed in the halo orbit around the Lagrangian point 1 (L1) of the Sun-Earth system.

Q 37.A

- **Formic acid or Methanoic Acid** is present in a natural state in stinging nettles and is responsible for the burning pain in contact with them. It is also found in the stings and bites of many insects, including bees and ants, which use it as a chemical defence mechanism. When the ant contracts its poison gland, the formic acid stored in this gland passes in the sting and is propelled out in jets (up to a distance of one meter in some species!) toward the attackers of the ant. Since formic acid has a pH of ~2-3, the attackers usually flee or are killed. **Hence, option (a) is the correct answer.**

Natural source	Acid	Natural source	Acid
Vinegar	Acetic acid	Sour milk (Curd)	Lactic acid
Orange	Citric acid	Lemon	Citric acid
Tamarind	Tartaric acid	Ant sting	Methanoic acid
Tomato	Oxalic acid	Nettle sting	Methanoic acid

Q 38.A

- **Bioplastic** refers to **plastic made from plants** like maize, wheat or sugarcane or other biological material instead of petroleum. **Bio-plastics are biodegradable and compostable plastic materials.**
- **Polyhydroxyalkanoates (PHAs)** are polyesters produced in nature by numerous microorganisms, including through **bacterial fermentation of sugars or lipids**. These plastics are biodegradable and are used in the production of bioplastics. **Hence option 1 is correct.**
- **Polylactic acid (PLA)** is a thermoplastic polyester formally obtained by **condensation of lactic acid with loss of water**. PLA has become a popular material due to it being economically produced from renewable resources and in 2021, had the highest consumption volume of any bioplastic of the world. **Hence option 2 is correct.**
- **Polyethylene terephthalate (PET or PETE)** is a strong, stiff **synthetic fibre** and resin and a member of the polyester family of polymers. **Hence option 3 is not correct.**

Q 39.B

Table 12.1: Speed of sound in different media at 25 °C		
State	Substance	Speed in m/s
Solids	Aluminium	6420
	Nickel	6040
	Steel	5960
	Iron	5950
	Brass	4700
	Glass (Flint)	3980
Liquids	Water (Sea)	1531
	Water (distilled)	1498
	Ethanol	1207
	Methanol	1103
Gases	Hydrogen	1284
	Helium	965
	Air	346
	Oxygen	316
	Sulphur dioxide	213

- Hence statement 1 is correct.
- The speed of sound in a medium depends on the temperature of the medium. The speed of sound decreases when we go from a solid to a gaseous state. In any medium, as we increase the temperature the speed of sound increases. For example, the speed of sound in air is 331 m s^{-1} at 0°C and 344 m s^{-1} at 22°C . Hence statement 2 is correct.
- In the case of gases, sound travels faster in gases with low density. Since the speed of sound in air is 346 m/s and in oxygen 316 m/s at 25°C . Hence statement 3 is not correct.

Q 40.B

- Human eat various types of food which has to pass through the digestive tract. Naturally the food has to be processed to generate particles which are small and of the same texture. This is achieved by crushing the food with our teeth.
- When we eat something we like, our mouth 'waters'. This is actually not only water, but a **fluid called saliva secreted by the salivary glands**.
- The food we ingest is its complex nature. If it is to be absorbed from the alimentary canal, it has to be broken into smaller molecules.
- This is done with the help of biological catalysts called enzymes. **The saliva contains an enzyme called salivary amylase that breaks down starch which is a complex molecule to give simple sugar**. The food is mixed thoroughly with saliva and moved around the mouth while chewing by the muscular tongue.
- From the mouth, the food is taken to the stomach through the food-pipe or oesophagus. The stomach is a large organ which expands when food enters it. The muscular walls of the stomach help in mixing the food thoroughly with more digestive juices.
- The digestion in stomach is taken care of by the gastric glands present in the wall of the stomach. These release hydrochloric acid, a protein digesting enzyme called pepsin, and mucus.
- **Gastric chief cells (in the stomach) secrete pepsin as an inactive zymogen called pepsinogen. Pepsin in gastric juice digests proteins such as those in meat, eggs, seeds, or dairy products. The hydrochloric acid creates an acidic medium which facilitates the action of the enzyme pepsin. Hence option 1 is not correct.**
- **The food coming from the stomach is acidic and has to be made alkaline for the pancreatic enzymes to act.** The pancreas contains exocrine glands that produce enzymes important to digestion. **These enzymes**

include trypsin and chymotrypsin to digest proteins; amylase for the digestion of carbohydrates; and lipase to break down fats. Hence option 2 is correct.

- **Lactase is an enzyme found in the mammalian small intestine that digests lactose, which is a sugar found in milk.** Mammals use milk to feed their young, and in most mammals, the activity of lactase decreases after the young is weaned and can consume other foods. Hence option 3 is correct.

Q 41.B

- The **combining capacity of the atoms of elements**, that is, their tendency to react and form molecules with atoms of the same or different elements, is explained as **an attempt to attain a fully-filled outermost shell.**
- In general, noble gases like **Helium, Argon, Krypton, Neon, Xenon, Radon, etc.** are not very reactive, their chemical inertness is due to the fact that they have **completely filled ns²np⁶ electronic configuration of their valence shells.** The other reasons are very high ionization enthalpy and almost zero electron affinity.
- **Hence, option (b) is the correct answer.**

Q 42.C

- **Sorbitol, also called D-sorbitol is a type of carbohydrate.** It falls into a category of **sugar alcohols called polyols.** It is a water-soluble compound and is found naturally in some fruits, including apples, apricots, dates, berries, peaches, plums, and figs.
- It is also commercially manufactured from corn syrup for use in packaged foods, beverages, and medications.
- **Applications of Sorbitol:**
 - Sorbitol is a **starch sweetener** often used as a **substitute for traditional sugar in diet foods** (including diet drinks) and confectionary items (cakes, biscuits, etc.) **Hence option 1 is correct.**
 - Sorbitol along with glycerol helps to **hold the toothpaste together, and it's also a sweetening agent.** **Hence option 4 is correct.**
 - Anti-diarrheal medication is used to treat sudden diarrhea (including traveler's diarrhea). It works by slowing down the movement of the gut and works in a manner opposite to the laxatives. It is used on its own as a **laxative to combat constipation.** It's hyperosmotic, meaning it draws water into the colon from surrounding tissues to promote bowel movements. **Hence option 2 is not correct.**
 - Used as a humectant and thickener in making **cosmetic creams and milky lotions**
 - It is used in the **preparation of synthetic vitamin C.** It is also used as a stabilizer in pharmaceutical products. **Hence option 3 is correct.**

Q 43.A

- **Acid rain** is made up of highly acidic water droplets due to air emissions, most specifically the **disproportionate levels of sulfur dioxide and oxides of nitrogen, emitted by vehicles and manufacturing processes.** Hence, statement 1 is correct.
- Sulfur and Nitrogen particles which get mixed with water are found in two ways either **man-made** i.e as the emissions that are given out from industries or by **natural causes** like lightning strikes in the atmosphere releasing nitrogen oxides and volcanic eruptions releasing sulfur oxide.
- The pH scale measures how acidic an object is. The scale has values ranging from zero (the most acidic) to 14 (the most basic). Pure water has a pH value of 7, this value is considered neutral—neither acidic nor basic. However, when rain combines with sulfur dioxide or nitrogen oxides—the rain becomes much more acidic. **Typical acid rain has a pH value of 4.** Hence, statement 2 is not correct.

Q 44.D

- Nuclear applications in agriculture rely on the use of isotopes and radiation techniques to combat pests and diseases, increase crop production, protect land and water resources, ensure food safety and authenticity, and increase livestock production. The nuclear-derived sterile insect technique (SIT) involves mass-rearing and sterilizing male insects before releasing them over pest-infested areas. **Hence option 1 is correct.**
- Common uses of nuclear medicine for diagnosis include, scans of the heart, lungs, kidneys, gallbladder, and thyroid **Hence option 2 is correct.**
- Radioactive sources are used for logging formation parameters. Radioactive tracers, along with the other substances in hydraulic-fracturing fluid, are sometimes used to determine the injection profile and location of fractures created by hydraulic fracturing. there is wide use of isotopes for measuring the steam quality before infusion into almost obsolete wells of oil to force out residual supplies. **Hence option 3 is correct.**

- Nuclear medicine therapy uses a small amount of radioactive material combined with a carrier molecule. This is called a radiopharmaceutical. Nuclear medicine therapies treat cancer and other conditions. Radiopharmaceuticals attach to specific cells and then deliver a high dose of radiation, destroying them. **Hence option 4 is correct.**
- Radioactive isotopes can greatly be utilized for the accurate measurement of pollutants in the environment including groundwater and river. Radioactive isotopic and nuclear tools use to monitor their pathways through the atmosphere, predict their distribution and estimate their impact on ecosystems. **Hence option 5 is correct.**

Q 45.A

- **Stevia** is often used as a **substitute to traditional table sugar**.
- It is derived from a highly **refined stevia leaf extract called rebaudioside A (Reb-A)**. **Hence, statement 1 is correct.**
- Sweeteners made with Reb-A are considered “**novel sweeteners**” because they’re blended with different sweeteners, such as erythritol (sugar alcohol) and dextrose (glucose).
- It’s about **100 to 300 times sweeter than table sugar**, but it has no carbohydrates, calories, or artificial ingredients in pure form. **Hence, statement 2 is not correct.**

Q 46.C

- **Sodium-based battery** technology might soon be a **viable alternative to lithium-based ones**, according to a study by **the University of Houston**.
- Sodium-ion batteries are rechargeable batteries which require sodium ion movement between electrodes during the charging and discharging of the battery, the cathode for these batteries is manufactured from sodium. Whereas, Lithium-ion batteries use an intercalated lithium compound as electrode material.
- Sodium batteries earlier **require three times the volume of lithium** needed to **produce the same amount of energy**. The biggest downside is that sodium-ion batteries have a lower energy density than lithium-ion batteries. **Hence, statement 1 is correct.**
- Sodium-ion batteries offer better performance and can **operate in a wider temperature range especially colder environments** as compared to Lithium-ion batteries. **Hence, statement 2 is not correct.**
- Sodium-ion batteries are cheaper to produce than their lithium counterparts because of the **abundance of sodium as raw materials** (mined from **soda ash and seawater**, which is easily available across the world). **Hence, statement 3 is correct.**

Q 47.B

- Sound is produced by vibrating objects.
- The matter or substance through which sound is transmitted is called a medium.
- Sound is a mechanical wave and needs a material medium like air, water, steel, etc., for its propagation. It cannot travel through a vacuum.
- Electromagnetic waves differ from mechanical waves in that they do not require a medium to propagate. This means that electromagnetic waves can travel not only through the air and solid materials but also through the vacuum. **Hence statement 1 is not correct.**
- In longitudinal waves, particles do not move from one place to another but they simply oscillate back and forth about their position of rest. This is exactly how a sound wave propagates, hence sound waves are longitudinal waves. **Hence statement 2 is correct.**
- In a transverse wave, particles do not oscillate along the line of wave propagation but oscillate up and down about their mean position as the wave travels. Thus a transverse wave is one in which the individual particles of the medium move about their mean positions in a direction perpendicular to the direction of wave propagation.

Q 48.D

- A pesticide is any substance used to kill, repel, or control certain forms of plant or animal life that are considered to be pests.
- **Bacteria-based pesticides** use subspecies and strains of **Bacillus thuringiensis, or Bt** making it the most widely used microbial pesticide.
- **Fungal-based pesticides (mycoinsecticide)** like **Beauveria bassiana** and **Metarhizium anisopliae** can be used to control plant diseases as well as some pests and weeds.
- **Microbial viral insecticides** are pathogens that attack insects and other arthropods. Viruses like **Baculoviruses** are used as insecticides/pesticides.

- **Protozoa-based pesticides use the Microsporidia group** to control the population of insects including caterpillar pests, grasshoppers, corn earworms, armyworms, European corn borers, cabbage loopers, and fall webworms.
- **Hence, option(d) is the correct answer.**

Q 49.D

- **Ministry of Environment, Forests and Climate Change (MoEFCC) notifies norms for fly ash utilization by power plants.**
 - MoEFCC has notified the **latest amendments exercising the power under the Environment (Protection) Act 1986.** Amendments are aimed at better utilization of fly ash by coal-based thermal power plants (TPPs) in the country.
- **About Fly ash:**
 - **Ash is the mineral matter left after burning coal. In a power plant, a major portion of the ash is carried off with flue gases (hence, the term fly ash), and can be filtered using electrostatic precipitators.** Due to improper handling, it ends up in neglected ash ponds in dangerous quantities, polluting the surface and groundwater.
- **Composition: substantial amounts of oxides of silicon, aluminum, calcium; arsenic, boron, chromium, lead, etc. in trace concentrations.**
- Usage: manufacturing of Portland cement, bricks, tiles, manufacturing of absorbents (for purification of waste gases, drinking water), etc.

Chemical Composition	Fly Ash (%)	Lime (%)
C	23.29	0
CaO	3.10	91.99
SiO ₂	36.10	3.75
Al ₂ O ₃	25.03	2.09
FeO	8.66	0.50
MgO	1.24	1.19
Na ₂ O	0	0.43
SO ₃	0.59	0.05
TiO ₂	0.91	0
K ₂ O	1.08	0
TOTAL	100.00	100.00

- **Hence, option (d) is the correct answer.**

Q 50.B

- Dark energy is an unknown form of energy that affects the universe on the largest scales. The first observational evidence for its existence came from measurements of supernovas which showed that the universe does not expand at a constant rate; rather, the universe's expansion is accelerating. Dark energy was discovered in **1998** with this method by two international teams that included American astronomers Adam Riess (the author of this article) and Saul Perlmutter and Australian astronomer Brian Schmidt. **Hence statement 1 is not correct.**
- The rate of expansion of the universe and its acceleration can be measured by observations based on the Hubble law. These measurements, together with other scientific data, have confirmed the existence of dark energy and provide an estimate of just how much of this mysterious substance exists.
- **Roughly 68% of the universe is dark energy.** Dark matter is called "dark" because it does not interact with electromagnetic force. This means it does not absorb, reflect or emit light, making it extremely hard to spot. In fact, researchers have been able to infer the existence of dark matter only from the gravitational effect it seems to have on visible matter. Dark matter seems to outweigh visible matter roughly six to one, making up about 27% of the universe. **Hence statement 2 is correct.**
- Dark energy and dark matter constitute 95% of the total mass-energy content.

Q.51) With reference to the Global Plastics Treaty, consider the following statements :

1. The treaty was signed at a meeting of the United Nations Climate Change Conference held in Glasgow, UK.
2. It makes the signatories legally binding to address the full life of plastics — from production to disposal, to end plastic pollution.

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:

Recently, the United Nations Environment Assembly (UNEA) in Nairobi, Kenya has endorsed a historic resolution to End Plastic Pollution and forge an international "legally binding agreement" by 2024 and a resolution was taken at the fifth session of the UNEA to address the full lifecycle of plastic, including its production, design and disposal.

The 26th UN Climate Change Conference of the Parties (COP26) in the Glasgow summit brought parties together to accelerate action toward the goals of the Paris Agreement of the UN Framework Convention on Climate Change, and the outcome of COP26 is Glasgow Climate Pact. Therefore, Global Plastics was not signed at a meeting of the United Nations Climate Change Conference held in Glasgow, UK.

So, Statement 1 is not correct.

The United Nations Environment Assembly's parties, including India, signed by 175 nations including India, mandated a resolution that makes it legally binding for the signatories to address the full life of plastics from production to disposal to end plastic pollution. **So, Statement 2 is correct.**

ADDITIONAL INFORMATION:

GLOBAL PLASTICS TREATY

- Recently in news** 175 countries that are parties to the UNEA signed a mandate which makes it legally binding for the signatories to address the full life of plastics to end plastic pollution. A Global Plastics Treaty adhering to the blueprint laid out in March 2022 will join the Montreal Protocol and the Paris Climate Agreement as one of the most significant international environment laws in history.
- Glasgow Climate Pact (GCP)**
 - The Glasgow Climate Pact (GCP) was adopted by 196 parties at the Glasgow climate change conference (COP26).
 - The Countries reaffirmed the Paris Agreement goal of limiting the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5.
- Paris Agreement**
 - The Paris Agreement is a legally binding international treaty on climate change.
 - It was adopted by 196 Parties at COP 21 in Paris on December 12, 2015, and entered into force on November 4, 2016.
 - The Paris Agreement is a landmark in the multilateral climate change process, and a binding agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects.
 - Its goal is to limit global warming to below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.
- Impacts Of Plastic production and pollution**
 - Exposure to plastics can harm human health, potentially affecting fertility, hormonal, metabolic and neurological activity, and the open burning of plastics contributes to air pollution.
 - By 2050, greenhouse gas emissions associated with plastic production, use and disposal would account for 15 percent of allowed emissions to limit global warming to 1.5°C (34.7°F).
 - More than 800 marine and coastal species are affected by this pollution through ingestion, entanglement, and other dangers.
 - Some 11 million tonnes of plastic waste flow annually into oceans, which may triple by 2040.
- About the UN Environment Programme (UNEP)**
 - The UN Environment Programme (UNEP) is the leading global voice on the environment.
 - It provides leadership and encourages partnership in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generations.

Q.52) Consider the following pairs :

- | <i>Indian Evacuation missions</i> | <i>Associated Country</i> |
|--|----------------------------------|
| 1. Operation Ganga | - Ukraine |
| 2. Operation Devi Shakti | - Sri Lanka |
| 3. Operation Raahat | - Yemen |
| 4. Operation Maitri | - Nepal |

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:

Operation Ganga is the initiative launched by the government of India to bring back Indians stranded in Ukraine after the start of the Russia-Ukraine war. Under this Evacuation mission, India has already successfully brought back more than 1,000 of its nationals from India.

Therefore, Operation Ganga's evacuation mission is associated with Ukraine.

So, Pair 1 is correct.

Operation Devi Shakti is India's evacuation mission carried out by the Indian Armed forces to evacuate Indian citizens and foreign nationals from Afghanistan after the US withdrawal from Afghanistan on August 15th 2021. India brought back 78 people, including 25 of its nationals from Afghanistan.

Therefore, the Operation Devi Shakti evacuation mission is not associated with Sri Lanka. **So, Pair 2 is not correct.**

Indian Armed Forces launched Operation Rahat to evacuate more than 4,000 Indian citizens and other foreign nationals from Yemen during the 2015 military intervention by Saudi Arabia and its allies.

It is an 11-day evacuation by sea from Aden port. Therefore, the Operation Rahat evacuation mission is associated with Yemen. **So, Pair 3 is correct.**

Operation Maitri is Nepal's rescue and relief operation by the Government of India and the Indian Armed Forces in the aftermath of the 2015 Nepal earthquake.

The Indian Army has named the aid to Nepal 'Operation Maitri' or friendship and started extending its help to the neighbouring country hit by a massive earthquake.

The Indian Army successfully evacuated 170 foreign nationals from the US, the UK, Russia and Germany. Therefore, Operation Maitri's evacuation mission is associated with Nepal. **So, Pair 4 is correct.**

ADDITIONAL INFORMATION:

OTHER IMPORTANT INDIAN EVACUATION MISSIONS AND ASSOCIATED COUNTRIES

- Operation Samudra Setu**
- Operation Samudra Setu was a naval operation launched in 2020 by India to bring home Indian citizens from overseas during the COVID-19 Pandemic.
 - It successfully brought back 3,992 Indian citizens to their homeland by sea.
 - Indian Naval ships Jalashwa (Landing Platform Dock) and Airavat, Shardul and Magar (Landing Ship Tanks) participated in this operation which lasted over 55 days and involved traversing more than 23,000 km by sea.



- Operation Sukoon**
- As Israel and Lebanon broke into military conflict in July 2006, the Government of India rescued its stranded citizens by launching 'Operation Sukoon,' also known as the 'Beirut Sealift.'
 - It was the largest naval rescue mission since the 'Dunkirk' evacuation.

- The task force evacuated about 2,280 people, including some Nepalese and Sri Lankan nationals, in 2006.
- Evacuation from Brussels**
 - In 2016, Belgium was hit by terrorist strikes at Brussels Airport in Zaventem, and one at Maalbeek Metro station in central Brussels.
 - Thirty-two civilians and three terrorists were killed, and more than 300 were injured.
 - A total of 242 Indians, including 28 crew members, returned to India on a Jet Airways flight.
- Operation Safe Homecoming**
 - In 2011, India launched 'Operation Homecoming' to bring back Indian citizens stranded in conflict-torn Libya.
 - Operation Safe Homecoming ended after 15,400 Indian nationals were brought home safely from Libya.
 - The Indian Navy and Air India conducted the air-sea operation.
- Vande Bharat Mission**
 - the Vande Bharat Mission is to bring back Indian citizens stranded in foreign countries during COVID-19 Pandemic hit.

Q.53) With reference to The Global Gender Gap Report 2022, consider the following statements :

1. The Global Gender Gap Index is released by the World Economic Forum.
2. India ranks 146th among a total of 146 countries in the 'Health and Survival' sub-index.
3. India also ranks the least among all the South Asian countries.

Which of the statements given above are correct ?

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

EXPLANATION:

The Global Gender Gap Index is released by the World Economic Forum, which benchmarks the current state and evolution of gender parity across four key dimensions (Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment). **So, Statement 1 is correct.**

India ranks 135 among a total of 146 countries in the Global Gender Gap Index 2022 and is the worst performer in the world in the "health and survival" sub-index, where it is ranked 146. In 2021, India ranked 140 out of 156 countries on the Global Gender Gap Index. **So, Statement 2 is correct.**

India	Rank 2022*
Global gender gap index	135
Economic participation and opportunity	143
Educational attainment	107
Health and survival	146
Political empowerment	48
<i>*out of 146 countries</i>	

India also ranks poorly among its neighbours and is behind Bangladesh (71), Nepal (96), Sri Lanka (110), Maldives (117) and Bhutan (126). Only Iran (143), Pakistan (145) and Afghanistan (146) perform worse than India in south Asia. The report notes that India's score of 0.629 was its seventh-highest score in the last 16 years.

So, Statement 3 is not correct.

ADDITIONAL INFORMATION:

GOVERNMENT INITIATIVES TO ACHIEVE GENDER GAP IN INDIA

**Recently in
News
About**

Recently, World Economic Forum released the Global Gender Gap Report 2022, in which India ranks 135 among 146 countries.

The government of India has given utmost priority to bridging the gender gap in India, reducing the disparity between men and women, improving the health of women, and increasing their socio-economic status and participation in various fields. Some major initiatives taken by the Government of India to remove the gender gap in all aspects of social, economic and political life are as follows:

- Beti Bachao Beti Padhao ensures the girl child's protection, survival and education.
- Sukanya Samridhi Yojna - Under this scheme, girls have been economically empowered by opening their bank accounts.
- Kasturba Gandhi Balika Vidyalayas (KGBVs) have been opened in educationally backward blocks for girls belonging to disadvantaged groups.
- Pradhan Mantri Matru Vandana Yojna aims to provide maternity benefits to pregnant and lactating mothers.
- Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) to provide comprehensive and quality Antenatal Care to pregnant women on the 9th of every month.
- LaQshya initiative to improve the quality of care in Labour room and Maternity Operation Theatres.
- Janani Suraksha Yojana (JSY) to provide financial assistance to pregnant women for encouraging institutional delivery.
- Janani Shishu Suraksha Karyakaram (JSSK) to eliminate out-of-pocket expenses for pregnant women delivering in public health institutions and sick infants accessing public health institutions for treatment.
- Skill Upgradation & Mahila Coir Yojna is an exclusive training programme of MSME aimed at skill development of women artisans engaged in coir Industry.
- To bring women in the mainstream of political leadership at the grass root level, government has reserved 33% of the seats in Panchayati Raj Institutions for women.

Q.54) Consider the following statements about Drug Price Control in India :

1. The National Pharmaceutical Pricing Authority (NPPA) is entrusted with the task of monitoring the prices of both controlled and decontrolled drugs
2. It is also entrusted with the task of recovering the amounts overcharged by the manufacturers from the customers for the controlled drugs.

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 Pharmaceutical Pricing Authority (NPPA) is an organization of the Government of India which was established, inter alia, to fix/revise the prices of controlled bulk drugs and formulations and to enforce prices and availability of the medicines in the country under the Drugs (Prices Control) Order, 1995.

The organization is also tasked with recovering amounts overcharged by manufacturers for controlled drugs from consumers. It also monitors the prices of decontrolled drugs in order to keep them at reasonable levels. **So, Statements 1 and 2 are correct.**

ADDITIONAL INFORMATION:

NATIONAL PHARMACEUTICAL PRICING AUTHORITY (NPPA)

- About** ➤ National Pharmaceutical Pricing Authority (NPPA) was constituted vide Government of India Resolution dated 29th August 1997 as an attached office of the Department of Pharmaceuticals (DoP), Ministry of Chemicals & Fertilizers as an independent Regulator for pricing of drugs and to ensure availability and accessibility of medicines at affordable prices.
- Functions** ➤ To implement and enforce the provisions of the Drugs (Prices Control) Order in accordance with the powers delegated to it.
- To deal with all legal matters arising out of the decisions of the Authority;
- To monitor the availability of drugs, identify shortages, if any, and take remedial steps;
- To collect/maintain data on production, exports and imports, market share of individual companies, the profitability of companies etc., for bulk drugs and formulations;
- To undertake and/or sponsor relevant studies in respect of the pricing of drugs/pharmaceuticals;
- To recruit/appoint the officers and other staff members of the Authority, as per rules and procedures laid down by the Government;
- To render advice to the Central Government on changes/revisions in the drug policy;
- To render assistance to the Central Government in parliamentary matters relating to drug pricing.

Q.55) Iprodione and Terbufos, considered carcinogenic in high quantities, are most likely present in which of the following ?

- (a) Pesticides**
(b) Food Preservatives
(c) Toiletries
(d) Micro-beads

EXPLANATION:

A pesticide is any chemical or biological substance intended to prevent or destroy any pest in agriculture, industry, public health, pest control operations, (or) for regular use.

- Iprodione:
- A fungicide used on vines, fruits, trees and vegetables has been classified as carcinogenic and toxic for reproduction.
 - Iprodione is used on fruit and vegetable crops affected by various fungal diseases.
 - It is also used as a nematicide and has a role as an antifungal agrochemical.
- Terbufos:
- It is a soil insecticide used commonly on sorghum, maize, beet and potatoes.
 - It is characterized as a colourless to pale yellow liquid.
 - It has been found to pose a risk to aquatic organisms due to its toxicity.

Iprodione and Terbufos are used in agriculture and are known for their harmful impacts on human health and the environment. **So, Option (a) is correct.**

ADDITIONAL INFORMATION:

IPRODIONE AND TERBUFOS

Recently in International trade of two new hazardous pesticides, Iprodione and Terbufos, has been

News	recommended for the “prior informed consent” (PIC) procedure under the Rotterdam Convention.
About	<ul style="list-style-type: none"> ➤ The chemicals are dangerous for humans and aquatic animals. ➤ The two chemicals have been included in the PIC procedure as “pesticides” based on the decision guidance documents. ➤ Iprodione was listed under ‘PIC procedure’ based on the final regulatory actions to ban its use, notified by the European Union and Mozambique. ➤ Terbufos was listed based on the final regulatory actions to ban its use, notified by Canada and Mozambique. And It is extremely hazardous for human health, according to the World Health Organization. ➤ India is among the largest exporters of Terbufos.
Pesticide	<ul style="list-style-type: none"> ➤ A pesticide is any substance or mixture of substances intended for <ul style="list-style-type: none"> • Preventing, destroying, repelling or mitigating any pest. • Use as a plant regulator, defoliant, or desiccant. • Use as a nitrogen stabilizer
Chemicals Covered Under the Rotterdam Convention	The Rotterdam Convention applies to industrial chemicals and pesticides that meet the criteria for listing under the Convention, generally because they have been banned or severely restricted in party countries or are severely hazardous pesticide formulations. Chemicals are subject to the PIC procedure if included in Annex III of the Rotterdam Convention.
Annex III	Annex III includes pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by two or more parties. A total of 54 chemicals are listed in Annex III, 35 pesticides (including 3 severely hazardous pesticide formulations), 18 industrial chemicals, and 1 chemical in both the pesticide and the industrial chemical categories.
Rotterdam Convention	<ul style="list-style-type: none"> ➤ The Rotterdam Convention is an international treaty designed to facilitate informed decision-making by countries with regard to trade in hazardous chemicals. ➤ It establishes a list of covered chemicals and requires parties seeking to export a chemical first to establish that the intended importing country has consented to the import. ➤ It entered into force in 2004 and became legally binding for its Parties.
Objectives of the Convention	<ul style="list-style-type: none"> ➤ To promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals to protect human health and the environment from potential harm; ➤ To contribute to the environmentally sound use of those hazardous chemicals by facilitating information exchange about their characteristics, providing for a national decision-making process on their import and export and disseminating these decisions to Parties.
Prior Informed Consent	<ul style="list-style-type: none"> ➤ The Rotterdam Convention establishes a prior informed consent (“PIC”) procedure to ensure that restricted hazardous chemicals are not exported to countries that do not wish to receive them. ➤ Rotterdam Convention is built on the voluntary PIC procedure, initiated by UNEP and FAO in 1989 and ceased on 24 February 2006. ➤ The PIC procedure does not ban or restrict any chemicals, nor does it mean that any individual country must automatically prohibit their import. ➤ Parties implement the PIC procedure through extensive information exchange, priority attention to national import decisions, and export controls obligations.

Q.56) Consider the following statements about FIFA World Cup 2022 :

1. Kylian Mbappe was awarded the Golden Ball award, while Argentina's Lionel Messi was awarded the Golden Boot Award.
2. Argentina clinched their second-ever World Cup Trophy in Football and became the first South American nation since 2002 to clinch the trophy.
3. The next edition of the FIFA world cup in 2026 will be held across three nations – the USA, Canada, and Mexico.

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

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

EXPLANATION:

The World Cup in football (soccer) is a quadrennial tournament of 32 men's national teams organized by the FIFA (International Federation of Association Football). It determines the sport's men's world champion.

Kylian Mbappe (8 goals including a hat-trick in the Final) was the top goal scorer in the 2022 FIFA awarded Golden boot award.

Lionel Messi was awarded the Golden Ball for being the best player at FIFA World Cup 2022 in Qatar. Therefore, Kylian Mbappe was awarded the golden boot award, while Lionel Messi won Golden Ball.

So, Statement 1 is not correct.

Argentina won three World Cups in 1978, 1986 and 2022.

Argentina became the first South American team to win World Cup since Brazil in 2002, and the victory was their first since 1986.

Therefore, Argentina clinched their third-ever World Cup Trophy in Football World Cup and became the first South American nation since 1986 to clinch the trophy.

So, Statement 2 is not correct.

The FIFA World Cup in 2026 is all set to be jointly hosted by three nations :

- The United States,
- Canada and
- Mexico.

It is the first time the finals have been split across three countries. Canada will be hosting the prestigious FIFA World Cup for the very first time in 2026. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

FIFA (INTERNATIONAL FEDERATION OF ASSOCIATION FOOTBALL)

- About**
 - The FIFA Foundation was established in 2018 as an independent entity to mobilize the positive power of football to improve lives.
 - It established the following programmes:
 - Foundation Community Programme
 - Recovery Programme
 - FIFA Legends Programme
 - Football for Schools Programme
 - Campus Programme
 - Refugee Programme
 - Employee Volunteer Programme
- The Best FIFA Football Awards**
 - The Best FIFA Football Awards annually honour the most outstanding members of the world's most popular sport.
 - They represent the game's highest honour for coaches and footballers and are a celebration in which football fans are recognized and play a vital and active part.
 - The Best FIFA Football Awards, which began in 2016, marked a new era in crowning

the outstanding figures in world football.

- The first ceremony was held in the TPC-Studios in Zurich and got fans more involved with their votes from 2016, helping crown the best players and coaches in men's and women's football.
- The FIFA Fan Award was also given out for the first time to honour outstanding gestures from supporters.

Q.57) Recently, the Narcotics Control Bureau (NCB) seized Black Cocaine from Mumbai Airport. In this context, consider the following statements about Black Cocaine :

1. It is a mixture of regular cocaine and other chemicals in administered quantities.
2. It contains substances that camouflage typical appearance to interfere with color-based drug tests.
3. It can be easily traced by well-trained Sniffer dogs and often goes undetected in other tests.

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:

Black Cocaine is regular Cocaine, which is typically white in colour. It is the additional substance that makes it black in colour. This is done to neutralize the smell of Cocaine. The pure cocaine base can be recovered from the mixture by extraction using common organic solvents such as methylene chloride or acetone and then it converted into powdered cocaine hydrochloride. It also reportedly makes it easier to smuggle as it can be disguised as asphalt, printer toner, charcoal, fertilizer or metal moulds.

So, Statement 1 is correct.



Black Cocaine is a mixture of regular cocaine bases with various substances to camouflage typical appearance (e.g., charcoal) to interfere with colour-based drug tests (cobalt salts form deep red complexes in solution).

So that the smell of Cocaine had been neutralized and it could pass through checkpoints easily, and the sniffer dogs at the airport could not detect it. The mixture of cobalt salts forms deep red complexes in solution, making it undetectable by drug-sniffing dogs as activated carbon may sufficiently absorb trace odours.

So, Statement 2 is correct, and Statement 3 is not correct.

ADDITIONAL INFORMATION:

NARCOTICS CONTROL BUREAU (NCB)

- About** ➤ The National Policy on Narcotic Drugs and Psychotropic Substances is based on the

Directive Principles contained in Article 47 of the Indian Constitution, which direct the State to endeavour to bring about prohibition of the consumption, except for medicinal purposes, of intoxicating drugs harmful to health.

- India is a signatory to the Single Convention on Narcotic Drugs 1961, as amended by the 1972 Protocol, the Conventions on Psychotropic Substances, 1971 and the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988.
- The Narcotic Drugs and Psychotropic Substances Act 1985, which came into effect on the 14th of November, 1985, made an express provision for constituting a Central Authority to exercise the powers and functions of the Central Government under the Act.
- Under this Narcotic Drugs and Psychotropic Substances Act 1985, Government of India constituted the Narcotics Control Bureau on the 17th of March, 1986. The Bureau, subject to the supervision and control of the Central Government.
- The Narcotics Control Bureau is the apex coordinating agency. It also functions as an enforcement agency through its zones and sub-zones.
- The zones and sub-zones collect and analyse data related to seizures of narcotic drugs and psychotropic substance, study trends, modus operandi, collect and disseminate intelligence and work in close cooperation with the Customs, State Police and other law enforcement agencies.
- "Black Cocaine" is being used by drug peddlers coming to India from South American countries.
- South American countries where coca plants grow are major suppliers of Cocaine to India. Generally, Mumbai is one of the landing points from where it is then sent to other parts of the country, especially to metro cities and Goa. Amongst narcotics, Cocaine is one of the most expensive ones and is primarily used by the upper classes of society.

Major Sources of Cocaine in India

- Q.58) With reference to National Agriculture Market(e-NAM), consider the following statements :
1. National Agriculture Market (eNAM) is a pan-India electronic trading portal that networks the existing APMC mandis to create a unified national market for agricultural commodities.
 2. Farmer Producer Organization (FPO) is the lead agency for implementing eNAM under the aegis of the Ministry of Agriculture and Farmers' Welfare, Government 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:

e - National Agriculture Market (e-NAM) is a pan-India electronic trading portal that networks the existing APMC Mandis to create a unified national agricultural commodity market.

The e-NAM Portal provides a single window service for all APMC-related information and services. This includes commodity arrivals and prices, buy and sell trade offers, and provisions to respond to trade offers, among other services.

So, Statement 1 is correct.

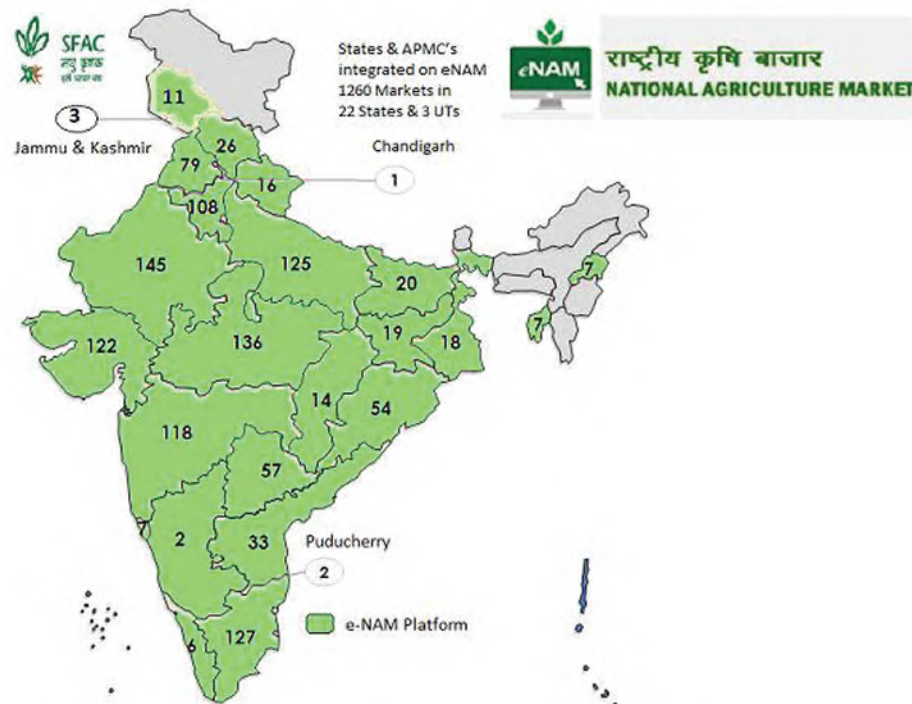
Small Farmers Agribusiness Consortium (SFAC) is the lead agency for implementing e-NAM under the aegis of the Ministry of Agriculture and Farmers' Welfare, Government of India. **So, Statement 2 is not correct**

ADDITIONAL INFORMATION:

NATIONAL AGRICULTURE MARKET (e-NAM)

About

- With the objective to usher reforms in the agri- marketing sector and promote online marketing of agri-commodities across the country, and provide maximum benefit to the farmers, the Government has approved a scheme to implement National Agriculture Market (NAM)
- Under the scheme, a web-based platform has been deployed across 585 regulated markets to promote online trading, digitalization of the entire functioning of markets outline gate entry, lot making, bidding, generation of e-sale agreement and e-payment etc., remove information asymmetry, increase transparency in the transaction process and enhance accessibility to markets across the country. This would entail real benefits to the farmers



FARMER PRODUCER ORGANISATIONS

About

A group of farmers involved in agricultural production and who have a common interest in pursuing agribusiness activities can form a group in a village or a cluster of villages and apply for a Farmer Producer Company registration under the relevant Companies Act.

Benefits

- As a cohesive group, farmers as members of the FPO will have better bargaining power which can be leveraged to buy or sell commodities at competitive prices.
- Aggregation of agricultural produce for better marketing opportunities. Trading in bulk saves farmers on associated expenditures like processing, storage, transportation etc.
- FPOs may take up activities for value addition like sorting/grading, packaging, basic processing etc., which fetch a higher price for the farmers' produce.
- FPO formation facilitates the utilization of pre and post-harvest infrastructure like greenhouses, mechanized farming, cold storage, agri-processing etc.
- FPO can expand its business activities by opening input stores, custom centers, etc., through which its member farmers can get subsidised inputs and services.

Q.59) De-regulation of the Sugar sector was done to improve the financial health of sugar mills and for timely payments of cane prices to sugarcane farmers. It was done based on the recommendations of :

- (a) Abhijit Sen
- (b) M S Swaminathan
- (c) B Shivaraman
- (d) Dr.C. Rangarajan**

EXPLANATION:

The Economic Advisory Council, chaired by C. Rangarajan, submitted a 'Report on the Regulation of Sugar Sector in India: The Way Forward' to the Prime Minister of India. The Report examines the issues related to the regulation of the sugar sector and suggests ways to promote efficiency and investments in the sector. The Committee found that existing regulations were stunting the industry's growth and recommended that the sector be deregulated. Deregulation would enable the industry to leverage the expanding opportunities created by the rising demand for sugar and sugarcane as a source of renewable energy.

The year 2013-14 was a water-shed for the sugar industry. The Central Government considered the Committee's recommendations on the de-regulation of the sugar sector and decided to discontinue the system of levy obligations on mills for sugar produced after September 2012 and abolished the regulated release mechanism for the open market sale of sugar.

The de-regulation of the sugar sector was undertaken to improve the financial health of sugar mills, enhance cash flows, reduce inventory costs and result in timely payments of cane prices to sugarcane farmers.

The recommendations of the Committee relating to Cane Area Reservation, Minimum Distance Criteria and adoption of the Cane Price Formula have been left to State Governments for adoption and implementation as they consider appropriate.

So, Option (d) is correct.

ADDITIONAL INFORMATION:

SUGAR SECTOR IN INDIA

- About**
- India is the second largest sugar producer in the world after Brazil and is also the largest consumer. The sugar industry is an important agro-based industry that impacts the rural livelihood of about 50 million sugarcane farmers and around 5 lakh workers directly employed in sugar mills.
 - The by-products of sugarcane are molasses and bagasse. The Committee recommended that there be no restrictions on the sale of by-products, and prices should be market determined. States should also undertake policy reform to allow mills to harness the power generated from bagasse.
 - The introduction of high-yielding varieties of sugarcane, adoption of drip irrigation systems, modernization of sugar plants and other R&D activities, the area of sugarcane cultivation, production of sugarcane, cane crushed, sugar production & its recovery percentage and the payment to farmers have increased considerably.
 - Every sugar mill mandatorily surrenders 10% of its production to the central government at a price lower than the market price is known as levy sugar.
 - The central government allows the release of non-levy sugar into the market on a periodic basis. Thus, sugar produced over the four-to-six month sugar season is sold throughout the year by distributing the release of stock evenly across the year.
 - The central government fixes a minimum price, the Fair and Remunerative Price (FRP) that is paid by mills to farmers. States can also intervene in sugarcane

pricing with a State Advised Price (SAP) to strengthen farmer's interests.

- Typically, SAP is higher than FRP.

Fair and Remunerative Price

The concept of Statutory Minimum Price (SMP) of sugarcane was replaced with the 'Fair and Remunerative Price (FRP)' of sugarcane. The cane price announced by the Central Government is decided on the basis of the recommendations of the Commission for Agricultural Costs and Prices (CACP) in consultation with the State Governments and after taking feedback from associations of sugar industry.

Ethanol Blended Petrol Programme

- The Ethanol Blended Petrol (EBP) programme was launched in year 2003 with the vision to boost agricultural economy, to reduce dependence on imported fossil fuel, to save foreign exchange on account of crude oil import bill, to reduce the air pollution and to support sugar sector and in the interest of sugarcane farmers.
- Currently, 5 percent of ethanol is blended with petrol in India. The government of India has advanced the target for 20 percent ethanol blending in petrol (also called E20) to 2025 from 2030.
- The central government has also released an expert committee report on the Roadmap for Ethanol Blending in India by 2025. The roadmap proposes a gradual roll out of ethanol-blended fuel to achieve an E10 fuel supply by April 2022 and a phased rollout of E20 from April 2023 to April 2025.

Q.60) Consider the following statements :

1. Odesa is a major Russian Black Sea port.
2. Russia claims Ukraine illegally occupies the port.

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:

Odesa Sea Port (UAODS Port) is the largest Ukrainian seaport and one of the largest ports in the Black Sea basin. Its total annual traffic capacity is 40 million tonnes.

Russian missiles destroyed Ukrainian "military infrastructure" in a strike on Ukraine's Black Sea port of Odesa, crucial for grain exports after Moscow and Kyiv signed deals to allow grain exports to resume.

It took less than 24 hours for Russia to launch a missile attack on Odesa's port, breaking its promises and undermining its commitments before the United Nations and Turkey under the Istanbul agreement.

Russia captured Ukraine's Odesa port with a missile attack, and Ukraine claims that Russia had illegally occupied the port. **So, Statements 1 and 2 are not correct.**

RUSSIA-UKRAINE WAR

The battle for Odesa

The fight for the **Black Sea port city**, with a population of one million, **could influence the outcome of the war** and affect regional security, experts say.



ADDITIONAL INFORMATION:

RUSSIAN - UKRAINE CONFLICT

- Recently in News About** Recently, There is a missile attack in the Odesa port of Ukraine by Russia after the agreement.
- When Russia started to invade Ukraine, U.S. and NATO powers supported the Ukraine.
 - Till 1991, Ukraine was a part of Soviet Union and after disintegration Russia tried to maintain the territory and already Russia maintained a maritime boundary after the annexation of Crimea.
 - Ukraine was the most powerful country in the Soviet Union after Russia, and they both maintained Cultural and linguistic relations.
 - North Atlantic Treaty Organisation (NATO) has tried to expand its powers to Eastern Europe, and Russia claimed it could threaten Russia's border.
 - Russia had also attacked the Odesa port of Ukraine as it carries the largest natural resources in the Transport corridor.
 - Then Ukraine will become a landlocked country and can't access the Black Sea either.
 - Black Sea grain Initiative was launched by Russia, Turkey, Ukraine, and the United Nations to enable the resumption of exports from Ukraine of grain, other foodstuffs, and fertilizer through a safe maritime humanitarian corridor from Ukrainian ports in the Black Sea to the rest of the world. Soon after Russia withdraws from the pact, U.N., Turkey and Ukraine agree to implement the Black Sea grain deal.
- Impact on India**
- India had been under pressure to support Russia or Western Countries because India maintains a strong political interest in Russia.
 - India must take a stand against Russia's bombing of civilians and annexing territory.
 - Over the past few months, the war and western sanctions have had a dramatic impact on global security, food, fuel and energy supplies.
 - Oil prices will be higher due to more freight/transportation costs from Russia and Ukraine. The Government's defiance of western sanctions on oil and defence trade is understandable in terms of defending India's national interests.
 - The surge in crude oil prices will lead to an increase in India's oil import bills, and

gold imports.

- Exporting the products from India to Russia will be a challenging task and the transportation cost will be higher.

Q.61) Consider the following statements about the Swadhar Greh Scheme :

1. It envisages providing shelter, food, clothing, health and legal aid as well as economic and social security for the women victims of difficult circumstances.
2. Boys only up to the age of 8 years would be allowed to stay in the Swadhar Greh with their mothers.

Which of the statements given above is/are correct ?

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2**
- (d) Neither 1 nor 2

EXPLANATION:

The Ministry of Women and Child Development is implementing the Swadhar Greh Scheme, which targets women victims of difficult circumstances who need institutional support for rehabilitation to lead their life with dignity.

The Scheme envisages providing shelter, food, clothing, health and legal aid, and economic and social security for these women. **So, Statement 1 is correct.**

Girls up to 18 years and boys up to 8 years would be allowed to stay in the Swadhar Greh with their mothers. Boys of more than 8 years of age need to be shifted to the Children's Homes run under the Juvenile Justice (Care and Protection of Children) Act / The Integrated Child Protection Scheme (ICPS).

So, Statement 2 is correct.

ADDITIONAL INFORMATION:

SWADHAR GREH SCHEME

About	The Scheme envisions a supportive institutional framework for women victims of difficult circumstances so they can lead their lives with dignity and conviction.
Objectives	Under the Scheme, Swadhar Greh will be set up in every district with a capacity of 30 women with the following objectives: <ul style="list-style-type: none">➤ To cater to the primary need of shelter, food, clothing, medical treatment and care for women in distress and who are without any social and economic support.➤ To enable them to regain their emotional strength that gets hampered due to their encounter with unfortunate circumstances.➤ To provide them with legal aid and guidance to enable them to take steps for their readjustment in family/society.➤ To rehabilitate them economically and emotionally➤ To act as a support system that understands and meets various requirements of women in distress.➤ To enable them to start their life afresh with dignity and conviction.
Beneficiaries	The benefit of the component could be availed by women above 18 years of age in the following categories: <ul style="list-style-type: none">➤ Women who are deserted and are without any social and economic support➤ Women survivors of natural disasters who have been rendered homeless and are without any social and economic support➤ Women prisoners released from jail and are without family, social and economic support➤ Women victims of domestic violence, family tension or discord who are made to

leave their homes without any means of subsistence and have no special protection from exploitation and/ or facing litigation on account of marital disputes

- Trafficked women/girls rescued or run away from brothels or other places where they face exploitation, and Women affected by HIV/AIDS who do not have any social or economic support. However, such women/ girls should first seek assistance under UJJAWALA Scheme in areas where it is in operation.
- Women affected by domestic violence could stay up to one year. For other categories of women, the maximum period of stay could be up to 3 years. Older women above 55 years of age may be accommodated for a maximum period of 5 years, after which they will have to shift to old-age homes or similar institutions.
- Swadhar Greh facilities could also be availed by the children accompanying women in the above categories. Girls up to the age of 18 years and boys up to the age of 12 years would be allowed to stay in the Swadhar Greh with their mothers. (Boys of more than 12 years of age need to be shifted to the Children Homes run under JJ Act/ICPS.)

Q.62) Consider the following statements about National Policy for Rare Diseases (NPRD) 2021:

1. Under NPRD, rare diseases have been categorized into 3 Groups.
2. The Central Government, through its Centres of Excellence, provides all primary, secondary and tertiary care facilities for the treatment of rare diseases.
3. Financial assistance for the treatment of rare diseases will be provided only for Group 3 categorized diseases.
4. The policy will make use of a crowdfunding mechanism to get financial support for those affected by rare diseases.

Which of the statements given above is/are correct ?

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

EXPLANATION:

The NPRD 2021 has provisions for promoting research and development for the diagnosis and treatment of rare diseases, promoting local development and manufacture of drugs and creating a conducive environment for indigenous manufacturing of drugs for rare diseases at affordable prices.

Under National Policy for Rare Diseases (NPRD) 2021, rare diseases have been identified and categorized into 3 groups: Group 1, Group 2 and Group 3.

Group 1: Disorders amenable to one-time curative treatment.

Group-2: Diseases requiring long-term or lifelong treatment having a relatively lower cost of treatment and benefit have been documented in the literature, and annual or more frequent surveillance is required.

Group 3:- Diseases for which definitive treatment is available, but challenges are to make the optimal patient selection for benefit, very high cost and lifelong therapy.

So, Statement 1 is correct.

The Central Government will notify the selected Centres of Excellence which will be premier Government tertiary hospitals with facilities for diagnosis, prevention and treatment of rare diseases. Eight (08) Centres of Excellence (CoEs) have been identified for diagnosing, preventing and treating rare diseases.

The identified CoEs will provide only tertiary care facilities and treatment and not primary and secondary care. **So, Statement 2 is not correct.**

Provision for financial support of up to Rs. 50 lakhs to the patients suffering from any category, either Group 1 or Group 2, or Group 3 of the Rare Diseases and for treatment in any of the Centre of Excellence (CoE) mentioned in NPRD-2021 outside the Umbrella Scheme of Rashtriya Arogya Nidhi.

To receive financial assistance for the treatment of rare diseases, the patient of the nearby area may approach the nearest Centre of Excellence to get assessed and avail of the benefits. **So, Statement 3 is not correct.**

Keeping in view the resource constraint and competing health priorities, it will be difficult for the Government to fully finance the treatment of high-cost rare diseases. So, The notified hospitals will share information about the patients, diseases from which they are suffering, estimated cost of treatment and details of bank accounts for donation or contribution through online systems to fill the funding gap by creating a digital platform. Donors can view patients' details on this digital platform and donate funds to a particular hospital. This will enable them from various sections of society to donate funds, which will be utilized to treat patients suffering from rare diseases, especially those under Group 3. **So, Statement 4 is correct.**

ADDITIONAL INFORMATION:

UMBRELLA SCHEME OF RASHTRIYA AROGAYA NIDHI

About

The umbrella scheme of Rashtriya Arogya Nidhi (RAN) will have three components and their objectives are,

(i) **Rashtriya Arogya Nidhi (RAN)** - to provide financial assistance to poor patients living below the threshold poverty line and suffering from life-threatening diseases relating to heart, kidney, liver, etc, for their treatment at Government hospitals/institutes having super specialty facilities.

(ii) **Health Minister's cancer Patients Fund (MCPF)** - to provide financial assistance to poor patients living below the threshold poverty line and suffering from cancer for their treatment at Regional cancer centers (RCCs) or Tertiary care Cancer centers (TCCC) and State Cancer Institute's (SCI).

(iii) **Scheme for financial assistance for patients suffering from specified rare diseases** - to provide financial assistance to poor patients living below the threshold poverty line and suffering from specified rare diseases for their treatment at Government hospitals/institutes having super specialty facilities.

3 Groups of rare diseases

The rare diseases have been identified and categorized into 3 groups, namely Group 1, Group 2 and Group 3.

- Group 1: Disorders amenable to one-time curative treatment.
- Group-2: Diseases requiring long-term/lifelong treatment having a relatively lower cost of treatment and benefit have been documented in the literature, and annual or more frequent surveillance is required.
- Group 3: Diseases for which definitive treatment is available, but challenges are to make the optimal patient selection for benefit, very high cost and lifelong therapy.

Nidan Kendras

- Nidan Kendras have been set up by the Department of Biotechnology (DBT) under the Unique Methods of Management and treatment of Inherited Disorders (UMMID) project for genetic testing and counseling services.
- These Nidan Kendras will perform screening, genetic testing and counseling for rare diseases. Nidan Kendras possessing the treatment facility, may do so under the guidance and supervision of a CoE.
- Five Nidan Kendras have been set up for genetic testing and counseling services.

Q.63) Amarjeet Sinha committee, sometimes seen in the news, is related to :

- (a) To study the status of rural working women
- (b) To assess the efficacy of the MGNREGA Scheme**
- (c) To review the local Gas pricing formula
- (d) Advisory committee set up by SEBI on Alternative Investment Policy

EXPLANATION:

Recently, The Government of India has constituted a Committee to study the performance of states and governance issues and to assess the program's efficacy under the Mahatma Gandhi National Rural Guarantee Scheme (MGNREGS). It was the 9-member Committee headed by former rural development department secretary Amarjeet Sinha, given three months to submit the report.

The Amarjeet Sinha committee has now been tasked to study the various factors behind the demand for MGNREGA work, expenditure trends and inter-State variations, and work composition. The committee has also been asked to examine various factors affecting the demand for wage employment in the rural sector in different parts of the country. It will suggest what changes in focus and governance structures are required to make MGNREGA more effective. **So, Option (b) is correct.**

ADDITIONAL INFORMATION:

AMARJEET SINHA COMMITTEE

- About**
- Mahatma Gandhi National Rural Guarantee Scheme (MGNREGA) was launched as a poverty alleviation instrument for the rural region, providing them with a safety net in the form of guaranteed work and wages. The MGNREGS guarantees 100-day wage employment in a financial year to every rural household.
 - The MGNREGS was launched in the 200 most-backward districts of the country in 2006. It was extended to 130 more districts during 2007-08 and the entire country in 2008-09.
 - It was felt that states like Uttar Pradesh and Bihar, where there is a higher level of poverty, haven't been able to utilize the scheme optimally. The scheme became a safety net for migrants who returned to their villages during the Covid-19 lockdown in 2020.
 - Amarjeet Sinha committee will study or analyze expenditure trends across states under the MGNREGS along with reasons for inter-state variations, focusing on governance issues.
 - The committee has also been mandated to recommend institutional mechanisms, including governance and administrative structures, for more effective utilization of MGNREGS funds, especially for addressing poverty and augmenting livelihoods.
 - It also examines if the composition of MGNREGS works may require a change of focus considering over 15-year-record of implementation, developments such as an extension of irrigation facilities, extensive work from multiple sources in various domains such as drinking water, sanitation, impending climate change etc.,

Q.64) Consider the following statements about the Sport of Tennis :

1. International Tennis Federation organizes the Davis Cup and the Billie Jean King cup
2. Rafael Nadal and Iga Swiatek have been crowned as the ITF world Champions in Men's and Women's categories, respectively.
3. Australia defeated Canada in the 2022 Davis Cup finals to clinch the title

Which of the statements given above are correct?

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

(c) 1 and 3 only

(d) 1, 2, and 3

EXPLANATION:

The International Tennis Federation (ITF) is the world governing body of tennis. It is responsible for overseeing the administration and regulation, the organization of the international competition, and the game's structure, development, and promotion of tennis.

The Billie Jean King Cup by Gainbridge (Title Partner) is managed and run by the International Tennis Federation (ITF); it also owns and runs Davis Cup by Rakuten (Title Partner), the largest annual international team competition in world sport.

The International Tennis Federation (ITF) controls the major international team events for all age groups and Wheelchair Tennis, including the world's two largest annual international team sports competitions, Davis Cup for men and the Billie Jean King Cup by BNP Paribas for women. **So, Statement 1 is correct.**

Rafael Nadal and Iga Swiatek were crowned the ITF world champion 2022 for men and Women. Rafael Nadal was crowned the ITF world champion for the fifth time in his career.

- Rafael Nadal won the Australian Open and the French Open in the year 2022.
- Swiatek went on a 37-match winning run and won the French and US Opens.

So, Statement 2 is correct.

The Davis Cup is run by the International Tennis Federation (ITF), the world governing body of tennis. With over 200 member nations, it's one of the largest federations in world sport.

Canada won their first Davis Cup title after Canada's Felix Auger-Aliassime beat Australia's Alex de Minaur 6-3, 6-4 to give them an unassailable 2-0 lead in Malaga, Spain. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

INTERNATIONAL TENNIS FEDERATION (ITF)

- | | |
|------------------|--|
| About | <ul style="list-style-type: none">➤ The International Tennis Federation (ITF) oversees the following five areas of the game:<ul style="list-style-type: none">• Administration and regulation• Organizing international competition• Structuring the game• Developing the game• Promoting the game➤ The ITF is involved at the highest levels of the game, including the 'the greatest show on earth,' the Olympic Games, to which tennis was reintroduced as a full medal sport in 1988. |
| Objective | <ul style="list-style-type: none">➤ To further grow and develop the sport worldwide.➤ To develop the game at all levels at all ages for both non-disabled and disabled men and women.➤ To make, amend and uphold the rules of the game.➤ To promote the International Team Championships and competitions of the ITF.➤ To preserve the integrity and independence of tennis as a sport.➤ To perform without discrimination based on colour, race, nationality, ethnic or national origin, age, sex or religion. |

Administration and Regulation The ITF administers and regulates the game through affiliated National Associations and six Regional Associations.

➤ **Administration**

- The ITF is responsible for the Rules of Tennis, including the technical specifications for courts and equipment and the running and enforcing of a joint anti-doping programme.

➤ **Organising international competitions:**

- The ITF controls the major international team events for all age groups and Wheelchair Tennis, including the world's two largest annual international team sports competitions, Davis Cup for men and the Billie Jean King Cup by BNP Paribas for women.

➤ The ITF is involved at the highest levels of the game, including the 'the greatest show on earth,' the Olympic Games, to which tennis was reintroduced as a full medal sport in 1988.

➤ In addition, the ITF works closely with the four Grand Slams:

➤ Australian Open, Roland Garros, Wimbledon and US Open, through its presence on the Grand Slam Board, support each event with administrative, officiating and media services.

ITF's Structure

3. Structuring the game

The ITF structures the game by sanctioning the following international circuits:

- Men's World Tennis Tour
- Women's World Tennis Tour
- World Tennis Tour Juniors
- Seniors Tennis Tour
- UNIQLO Wheelchair Tennis Tour
- Beach Tennis Tour

Q.65) Consider the following statements :

1. Livestock production accounts for 70 percent of all agricultural land and 30 percent of the planet's land surface.
2. Agriculture accounts for 70 percent of water withdrawals worldwide and plays a major role in water pollution.
3. Nitrate from agriculture is now the most common chemical contaminant in the world's groundwater aquifers.

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:

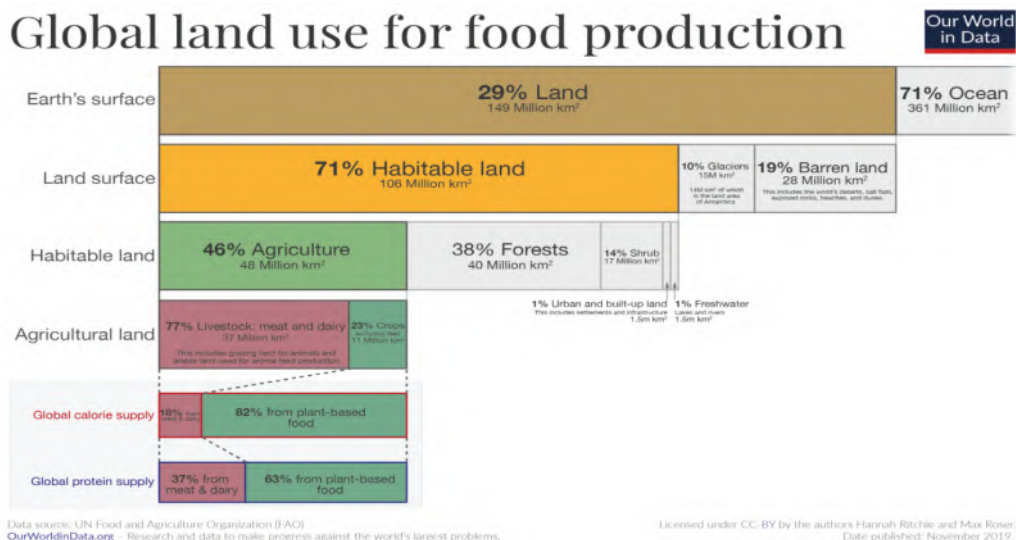
Land – a notion that broadly includes climate, topography, vegetation, soils and other natural resources – is the basis for agriculture. The interaction between these components is vital for determining agroecosystems' productivity and sustainability.

Livestock is domesticated animals raised in an agricultural setting to provide labour and produce diversified products for consumption, such as meat, eggs, milk, fur, leather, and wool.

Half of the world's habitable land is used for agriculture. More than three-quarters of this is used for livestock production. Livestock production now accounts for 70 percent of all agricultural land and 30

percent of the planet's land surface.

So, Statement 1 is correct.



Water is a critical input for agricultural production and plays an important role in food security. Irrigated agriculture represents 20 percent of the total cultivated land and contributes 40 percent of the total food produced worldwide. Agriculture, which accounts for 70 percent of water withdrawals worldwide, plays a major role in water pollution. Farms discharge large quantities of agrochemicals, organic matter, drug residues, sediments and saline drainage into water bodies. **So, Statement 2 is correct.**

In crop production, water pollution from nutrients occurs when fertilizers are applied at a greater rate than they are fixed by soil particles or exported from the soil profile (e.g., by plant uptake or when they are washed off the soil surface before plants can take them up).

Excess nitrogen and phosphates can leach into groundwater or move via surface runoff into waterways. Phosphate is not as soluble as nitrate and ammonia and tends to get adsorbed onto soil particles and enter water bodies through soil erosion. Nitrate from agriculture is the most common chemical contaminant in the world's groundwater aquifers. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

MAJOR WATER POLLUTANTS IN AGRICULTURE

Pollutant category	Indicators/examples
Nutrients	Primarily nitrogen and phosphorus are present in chemical and organic fertilizers as well as animal excreta and are normally found in water as nitrate, ammonia or phosphate.
Pesticides	Herbicides, insecticides, fungicides and bactericides, including organophosphates, carbamates, pyrethroids, organochlorine pesticides and others (many, such as DDT, are banned in most countries but are still being used illegally and persistently)
Salts	E.g., ions of sodium, chloride, potassium, magnesium, sulfate, calcium and bicarbonate. Measured in water, either directly as total dissolved solids or indirectly as electric conductivity
Sediment	Measured in water as total suspended solids or nephelometric turbidity units – especially from pond drainage during harvesting
Organic	Chemical or biochemical oxygen-demanding substances (e.g., organic materials such as

- matter** plant matter and livestock excreta), which use up dissolved oxygen in the water when they degrade
- Pathogens** Bacteria and pathogen indicators. E.g. Escherichia coli, total coliforms, faecal coliforms and enterococci
- Metals** E.g., selenium, lead, copper, mercury, arsenic and manganese
- Emerging pollutants** E.g., drug residues, hormones and feed additives

Q.66) Consider the following pairs :

Regions	Countries
1. Po Valley	India
2. Batken	Kyrgyzstan
3. Tigray	Ethiopia

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

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

EXPLANATION:

The Po River, the longest in Italy, is facing a water crisis, and its effects are visible as drought covers a big part of the country. The river is the biggest freshwater reservoir, and farmers use a significant portion of it for agricultural purposes. The Po River spans the entire Po Valley from west to east and is 652 kilometres long. It spreads over 71,000 square kilometres and is the largest river basin in Italy. The valley, which provides around 40 percent of Italy's food, including wheat, rice, and tomatoes, is the most significant agricultural region in the nation. **So, Pair (1) is not correct.**



Batken region is located in the southwest of Kyrgyzstan. It borders Tajikistan in the south, Uzbekistan in the north and Osh region in the east. Batken region is located in the southern foothill part of the Fergana Valley. The lowest point of the Kyrgyz Republic (401 m above sea level) is located here (for comparison, the highest point is Peak Pobeda 7439m).

Recently, there has been a violent border clash between Kyrgyzstan and Tajikistan. The Batken region

of Kyrgyzstan is seeing families being moved out and getting relocated. Nearly 150,000 people of the Batken region have either fled the area or have been relocated by the state.

Ferghana valley in Central Asia lies mainly in eastern Uzbekistan but extends into southern Kyrgyzstan and northern Tajikistan. It continues to be a site of struggle and frequent violent outbursts, with the location consisting primarily of Tajiks, Kyrgyz, and Uzbeks, who have historically shared common sociological specificities, economic activities, and religious practices. **So, Pair (2) is correct.**

The Tigray Region, officially the Tigray National Regional State, is the northernmost regional state in Ethiopia. The Tigray Region is the homeland of the Tigrayan, Irob, and Kunama people. Its capital and largest city are Mekelle.

The conflict in Ethiopia started back in November 2020 and left nearly half of Tigray's population without enough food as aid groups struggled to reach rural areas owing to inadequate fuel supplies World Health Organization (WHO) described the humanitarian crisis in Ethiopia's Tigray region as the "worst disaster on earth." **So, Pair (3) is correct.**



ADDITIONAL INFORMATION:

KYRGYZSTAN - TAJIKISTAN CONFLICT

- About**
- Border clashes recommenced between Kyrgyzstan and Tajikistan that the borders of the two republics were demarcated under Joseph Stalin's leadership.
 - Historically, the Kyrgyz and Tajik populations enjoyed common rights over natural resources. The issue of the delimitation of the border is a relic of the Soviet era.
 - While regular talks have tried to resolve the issue, one of the crucial points of disagreement remains over the map which should be used for demarcation purposes. Almost half of its close to a 1000 km border is disputed.
 - Ferghana Valley continues to be a site of struggle and frequent violent outbursts, with the location consisting primarily of Tajiks, Kyrgyz, and Uzbeks, who have historically shared common sociological specificities, economic activities, and religious practices.
 - The clashes intensified when Tajik units began using tanks, APCs, and mortars to enter Kyrgyz villages.
 - In addition to that, they started attacking the airport of the Kyrgyz town of Batken and neighboring regions. Kyrgyzstan and Tajikistan blamed each other.
 - The conflict continued for two days until the nations agreed to a ceasefire that lasted only a day.

- In September 2022, Tajikistan and Kyrgyzstan signed a peace deal.



Q.67) With reference to the Domestic Support under the Agreement on Agriculture of the WTO, consider the following statements :

1. Subsidies that are government funded and do not involve price support are classified as Green Box subsidies.
2. Subsidies that limit the production of the farmer are classified as Amber Box subsidies.
3. Domestic support measures considered to distort production and trade fall into the Blue box.

Which of the statements given above is/are correct ?

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

EXPLANATION:

In World Trade Organisation (WTO) terminology, subsidies, in general, are identified by "boxes," which are given the colors of traffic lights: green (permitted), amber (slow down — i.e., need to be reduced), red (forbidden).

- Green box

In order to qualify, green box subsidies must not distort trade or, at most, cause minimal distortion. They have to be government-funded (not by charging consumers higher prices) and must not involve price support. "Green box" subsidies are therefore allowed without limits, provided they comply with the policy-specific criteria set out.

So, Statement 1 is correct.

- Amber box

Nearly all domestic support measures considered to distort production and trade (with some

exceptions) fall into the amber box, which is defined in Article 6 of the Agriculture Agreement as all domestic supports except those in the blue and green boxes. These include measures to support prices or subsidies directly related to production quantities. These supports are subject to limits. "De minimis" minimal supports for both product-specific and non-product-specific support are allowed, defined as a share of the value of agricultural production. **So, Statement 2 is not correct**

➤ Blue box

The blue box is the "amber box with conditions" — conditions designed to reduce distortion. Any support that would normally be in the amber box is placed in the blue box if the support also requires farmers to limit production. At present, there are no limits on spending on blue box subsidies. **So, Statement 3 is not correct**

ADDITIONAL INFORMATION:

WORLD TRADE ORGANIZATION (WTO)

About The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to ensure that trade flows as smoothly, predictably and freely as possible.

As a member of the WTO, India is governed by a number of major agreements like

- Agreement on Subsidies & Countervailing Measures,
- The General Agreement on Trade in Services (GATS)
- Sanitary and phytosanitary (SPS)
- Trade-Related Aspects of Intellectual Property Rights (TRIPS)
- Agreement on Trade-Related Investment Measures (TRIMS)
- Agreement on Agriculture
- Agreement on Textiles.

THE GENERAL AGREEMENT ON TRADE IN SERVICES (GATS)

About ➤ The General Agreement on Trade in Services (GATS) is the first and only set of multilateral rules governing international trade in services. Negotiated in the Uruguay Round.

➤ Services represent the fastest-growing sector of the global economy and account for two-thirds of global output, one-third of global employment and nearly 20% of global trade

➤ The General Agreement on Trade in Services has three elements: the main text containing general obligations and disciplines; annexes dealing with rules for specific sectors; and individual countries' specific commitments to provide access to their markets, including indications of where countries are temporarily not applying the "most-favored-nation" principle of non-discrimination.

General obligations and disciplines The agreement covers all internationally-traded services — for example, banking, telecommunications, tourism, professional services, etc. It also defines four ways (or "modes") of trading services:

- Services supplied from one country to another (e.g., international telephone calls), officially known as "cross-border supply" (in WTO jargon, "mode 1")
- Consumers or firms making use of a service in another country (e.g., tourism), officially "consumption abroad" ("mode 2")
- A foreign company setting up subsidiaries or branches to provide services in another country (e.g., foreign banks setting up operations in a country), officially "commercial presence" ("mode 3")

- Individuals are traveling from their own country to supply services in another (e.g., fashion models or consultants), officially the "presence of natural persons" ("mode 4").

Most-favoured-nation (MFN) treatment Favour one, favour all. MFN means treating one's trading partners equally on the principle of non-discrimination. Under GATS, if a country allows foreign competition in a sector, equal opportunities in that sector should be given to service providers from all other WTO members. (This applies even if the country has made no specific commitment to provide foreign companies access to its markets under the WTO.)

Q.68) Which of the below countries does not share borders with Syria ?

(a) Saudi Arabia

(b) Turkey

(c) Iraq

(d) Lebanon

EXPLANATION:

Syria is located in West Asia. The Euphrates, the longest river in West Asia, flows from Turkey through parts of Syria. A massive dam built alongside the river in north-central Syria led to the formation of Lake Assad, the country's largest lake. Syria is bordered by

- Lebanon
- Israel
- The Mediterranean Sea
- Turkey
- Iraq
- Jordan

Thus Syria does not share border with Saudi Arabia. **So, Option (a) is correct.**



ADDITIONAL INFORMATION:

GEOGRAPHY OF SYRIA

- About**
- Syria's two major regions, the western and eastern regions, are separated by the Great Rift Valley (Jordan Rift Valley).
 - Syria consists of mountain ranges in the west and farther inland a steppe area.
 - In the east is the Syrian Desert, in the south is the Jabal al-Druze Range.
 - The Syrian Desert, also known as the Syro-Arabian desert is a combination of steppe and true desert located in the northern Arabian Peninsula covering 200,000 square miles.
 - The western region lies on the western side of the Great Rift Valley, where the Anti-Lebanon Mountains, a southwest-northeast-trending mountain range between Syria and Lebanon, form the eastern edge of the rift valley. Its features are the coast, mountains, and river valleys.
 - The coast is a narrow strip of land that runs along the Mediterranean Sea from Lebanon to Turkey. The coast is an important agricultural region that receives enough moisture from the Mediterranean Sea so that irrigation is not necessary.
 - In the south west, the Plain of Akkar extends across the border with Lebanon.
 - Along the coast are sandy beaches alternating with rocky headlands and cliffs. These are spurs of the Jabal an Nusayriyah (Jabal Alawite) range, which runs roughly north and south. The Jordan River rises on Mount Hermon and flows south in the Jordan Trench to the Sea of Galilee.
 - The rift valley then continues north to near the border with Turkey. Its northern end is near Aleppo (Haleb), one of Syria's major cities.
 - The Euphrates River rises in Turkey and flows across Syria before entering Iraq. The Tabka Dam on the Euphrates has formed the Assad Reservoir (Lake Assad).
 - Further downstream, the Balikh and Khabur rivers also join the Euphrates as they flow across the Al-Jazirah (upper Mesopotamia) region.
 - The southern and eastern areas of Syria are the northern part of the Syrian Desert. This

area is located on a plateau that descends from 610 to 910 m (2,000 to 3,000 ft) above sea level at the edge of the rift valley.

- It gradually descends to a flat sandy desert plain that joins with the border of Iraq. It also slopes down to the Euphrates River as its eastern boundary.
- Much of the southern part is a rocky plain. Syria, as part of the "Fertile Crescent", contains numerous historic places. One is the ruin of Palmyra, which was a famous caravan city on the Spice Road.

Q.69) With reference to Geographical Indication (GI), consider the following statements :

1. GI is governed and directed by the World Intellectual Property Organization Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).
2. The registration of a geographical indication is valid for a period of 10 years.
3. Trademark and Geographical Indication are interchangeably used to identify goods having special characteristics originating from a definite geographical territory.

Which of the statements given above is/are correct ?

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

EXPLANATION:

Geographical Indication is governed and directed by the World Trade Organisation (WTO) (not WIPO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

India, as a member of the World Trade Organization (WTO), enacted the Geographical Indications of Goods (Registration & Protection) Act, 1999 has come into force with effect from 15th September 2003.

So, Statement 1 is not correct.

The registration of a geographical indication is valid for 10 years. It can be renewed from time to time for a further period of 10 years. If a registered geographical indication is not renewed, it is liable to be removed from the register. **So, Statement 2 is correct.**

A trademark is a sign used in the course of trade, distinguishing the goods or services of one enterprise from those of other enterprises. In contrast, a Geographical indication is used to identify goods with special characteristics originating from a definite geographical territory. Thus, trademark is not interchangeably used to identify goods with special characteristics. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

GEOGRAPHICAL INDICATION (GI)

- About**
- Geographical Indications of Goods are defined as that aspect of industrial property which refers to the geographical indication referring to a country or a place situated therein as the product's country or place of origin. Typically, such a name conveys an assurance of quality and distinctiveness, which is essentially attributable to its origin in that defined geographical locality, region or country.
 - A geographical indication is a public property belonging to the producers of the concerned goods. It shall not be the subject matter of assignment, transmission, licensing, pledge, mortgage or such other agreement. However, when an authorised user dies, his right devolves on his successor in title.
 - The Appellate Board or the Registrar of Geographical Indications has the power to remove the geographical Indication or an authorised user from the register.
 - Goods (Registration & Protection) Act, 1999 would be administered by the Controller General of Patents, Designs and Trade Marks and the Registrar of Geographical Indications.
 - The Geographical Indications Registry located in Chennai.

- India has a diverse culture and is home to various arts and crafts. The top 5 states holding the maximum number of GIs are Karnataka, Tamil Nadu, Uttar Pradesh, Karnataka and Kerala.
- Benefit of GI**
 - It confers legal protection to Geographical Indications in India.
 - It prevents unauthorised use of a Registered Geographical Indication by others.
 - It provides legal protection to Indian Geographical Indications which in turn boost exports.
 - It promotes economic prosperity of producers of goods produced in a geographical territory.
- GI Tags in India**
 - Recently, the total number of Registered Geographical Indications (GI) tags rises to 432.
 - Recent GI tags in India:
 - Gamosa of Assam - Woollen woven handloom product.
 - Tandur Redgram of Telangana - local variety of pigeon pea.
 - Raktsey Karpo Apricot of Ladakh - Organic sweetness from family of Apricot.
 - Alibag White Onion – Onion variety of Maharashtra.
 - Attappady thuvara (Attappady red gram) – Kerala.
 - Kanthalloor Vattavada Garlic – Kerala.
 - Kodungallur Snap Melon – Kerala.
 - Attappady Aattukombu Dolichos Bean – Kerala.
 - Onattukara sesame (Ellu) – Kerala.

Q.70) Consider the following :

1. The northern parts of the state have a dense Teak forest.
2. Medaram Jatra is celebrated here as a state festival.
3. Kinnersani Wildlife sanctuary is located in this state.

These are the characteristics of which of the following states ?

- (a) Maharashtra
- (b) Karnataka
- (c) Telangana**
- (d) Odisha

EXPLANATION:

Telangana is a semi-arid area and has a predominantly hot and dry climate. The State of Telangana is endowed with a rich diversity of Flora and Fauna. The State has dense Teak Forests on the northern part along the banks of river Godavari. The State of Telangana is endowed with a rich diversity of Flora and Fauna.

Medaram Jatara is the second-largest fair in India after the Kumbh Mela, celebrated by the second-largest Tribal Community of Telangana, the Koya tribe, for four days. The Medaram Jathara festival is held every two years in Medaram Village of Tadvai Mandal, deep in the heart of the thick forests of Mulugu district. This Jatara was declared a State Festival in 1998.

The tribals offer prayers at the bamboo grove and bring back a casket of vermilion and bamboo sticks wrapped in red cloth, symbolising the return of Sammakka and Sarakka (Adivasi icons - protectors of the community).



The Kinnerasani Wildlife Sanctuary is located near Paloncha town in the Khammam district. It has plentiful land that serves as the native land for several endangered species. This Sanctuary got its name after the river Kinnerasani divides the Sanctuary and meets Godavari.

The fauna found in this Sanctuary is Panthers, Chinkara, Chousinghas, Sambar, Cheetal, Gaurs, Hyena, Jackals, WildBoars, Tigers, Sloth Bear, and Black Bucks. Tourists can also spot birds like Jungle Fowl, Quails, Partridges, Peafowl, Nuktas, Spoonbills, Teals, and Doves. **So, Option (c) is correct.**

Q.71) Boltzmann Medal, which has been in news recently, is related to :

(a) Statistical Physics

(b) Astrophysics

(c) Particle Physics

(d) Relative Mechanics

EXPLANATION:

Recently, Professor Deepak Dhar and John J. Hopfield were chosen for the Boltzmann medal awarded by the Commission on Statistical Physics (C3) of the International Union of Pure and Applied Physics. Prof. Deepak Dhar is the first Indian to receive this top honour in the field of statistical physics, initiated in 1975, with Nobel laureate (1982) K.G. Wilson being the first recipient.

Professor Deepak Dhar received the highest award in the field of statistical physics, including exact solutions of self-organized criticality models, interfacial growth, and universal long-time relaxation in disordered magnetic systems, exact solutions in percolation and cluster counting problems and definition of spectral dimension of fractals.

The award consists of the gilded Boltzmann medal with the inscription of Ludwig Boltzmann, and the chosen two scientists will be presented the medals at the International Conference on Statistical Physics (StatPhys28) conference to be held in Tokyo in August 2023.

Boltzmann was an Austrian physicist and Philosopher. He contributed to the development of Statistical mechanics, one of the pillars of modern physics, and the development of the statistical explanation of the second law of thermodynamics.

So, Option (a) is correct.

ADDITIONAL INFORMATION:

OTHER AWARDS TOWARDS THE CONTRIBUTION IN PHYSICS

**Dannie
Heineman
Prize for
Astrophysics**

- The Dannie Heineman Prize for Astrophysics is awarded jointly by the American Institute of Physics and the American Astronomical Society and is funded by the Heineman Foundation. It was established in 1979 to recognize outstanding mid-career work in astrophysics. No restrictions are placed on a candidate's citizenship or country of residency.
- In the year 2022 Dannie Heineman prize was awarded to Norman Murray for his deep theoretical insight into an exceptionally broad range of astrophysical

phenomena, including the dynamics of planetary systems, accretion disk winds in active galactic nuclei, and star formation and feedback in galaxies.

Nobel Prize for Physics	The Nobel Prize in Physics 2022 was awarded to Alain Aspect, John F. Clauser and Anton Zeilinger for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science.
Shanti Swarup Bhatnagar Prize for Science and Technology	It is a Science award given annually by the Council of Scientific and Industrial Research (CSIR) for notable and outstanding research, applied or fundamental, in biology, chemistry, environmental science, engineering, mathematics, medicine and Physics.
Aryabhata Award	<ul style="list-style-type: none">➤ The Aryabhata award is an annual award presented to individuals with notable lifetime contributions in the field of astronautics and aerospace technology in India.➤ Cyber security expert Dr Ananth Prabhu Gurupura was presented 'Aryabhata Award 2022' in the programme for his service in the cyber sector and social work.
Awards in Particle Physics	The High Energy and Particle Physics Prize, established in 1989, is awarded every two years by the European Physical Society (EPS) for an outstanding contribution to high energy and particle physics

Q.72) With reference to the Protection of Women from Domestic Violence Act, 2005, which of the following statements is/ are correct ?

1. All women who may be mothers, sisters, wives, widows, or partners living in a shared household are covered.
2. Even a minor child is covered under the act.
3. It also protects women in live-in relationships.

Which of the statements given above is/are correct ?

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

EXPLANATION:

The Protection of Women from Domestic Violence Act, 2005, provides effective protection of the rights of women guaranteed under the Constitution who are victims of violence of any kind occurring within the family and for matters connected therewith.

Domestic Violence Act, 2005 defines "domestic violence" to include actual abuse or the threat of abuse that is physical, sexual, verbal, emotional or economic. Harassment by unlawful dowry demands to the woman, or her relatives would also be covered.

The Domestic Violence Act 2005 includes all women who may be mothers, sisters, wives, widows or partners living in a shared household. **So, Statement 1 is correct.**

Section 2 (b) of the Protection of Women from Domestic Violence Act, 2005 defines a child as "any person below the age of eighteen years and includes any adopted, step or foster child."

Under the Domestic Violence Act of 2005, a minor child is also entitled to protection. The mother of such a minor child may file a petition or application on behalf of her minor child (male or female).

In cases where the mother makes an application to the Court for herself, the children can also be added as co-applicants for relief under the Protection of Women from Domestic Violence Act. The Court can also, whenever appropriate, appoint a guardian or next of friend to represent the child. **So, Statement 2 is correct.**

A live-in relationship is: "An arrangement of living under which the couples which are unmarried life together to conduct a long-going relationship similarly as in marriage.

The Supreme Court and other courts have held that live-in relationships, which are in the nature

of marriage, are protected under the provisions of the Protection of Women against Domestic Violence Act (PWDVA).

In *Navtej Singh Johar and Others Vs. Union of India and Ors* (Writ Petition (Criminal) No. 76 of 2016) case, the Supreme Court held that consensual sexual acts of adults in private are constitutional," **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

DOMESTIC VIOLENCE ACT OF 2005

- | | |
|---|--|
| About | <ul style="list-style-type: none">➤ Protection of Women from Domestic Violence Act, 2005, came into force in 2006.➤ It is a very comprehensive and promising legislation that combines civil remedies with criminal procedures to ensure effective protection and immediate relief to victims of violence of any kind occurring within the family.➤ The aggrieved can seek protection against any physical, sexual, verbal and emotional abuse or economic abuses. This law, for the first time, recognizes a women's right to a violence free home. |
| Salient features of the Act | <ul style="list-style-type: none">➤ It covers those women who are or have been in a relationship with the abuser where both parties have lived together in a shared household and are related by consanguinity, marriage, a relationship in the nature of marriage, or adoption.➤ In addition, relationships with family members living together as a joint family are also included.➤ Even those women who are sisters, widows, mothers, single women, or living with the abuser are entitled to protection under the proposed legislation.➤ However, whereas the Act enables the wife or the female living in a relationship in the nature of marriage to file a complaint against any relative of the husband or the male partner, it does not enable any female relative of the husband or the male partner to file a complaint against the wife or the female partner;➤ It confers on the aggrieved woman the right to reside in a shared household, whether or not she has any title or rights in the same. In fact, a respondent, not being a female, can be directed under the Act to remove himself from the shared household or to secure for the aggrieved woman the same level of alternate accommodation as enjoyed by her in the shared household or to pay rent for the same;➤ The orders for relief the aggrieved woman is entitled to under the Act include protection orders, residence orders, monetary relief, custody orders and compensation orders;➤ It empowers the Magistrate to pass a protection order in favour of the abused to prevent the abuser from aiding or committing an act of domestic violence or any other specified act, entering a workplace or any other place frequented by the abused, attempting to communicate with the abused, isolating any assets used by both the parties and causing violence to the abused, her relatives or others who provide her assistance against the domestic violence;➤ It provides for the appointment of Protection Officers. It recognizes and involves nongovernmental organizations as service providers for assisting the abused concerning medical examination, obtaining legal aid, and safe shelter. |
| Rights protected For Women Under Domestic Violence | <ul style="list-style-type: none">➤ Under the Act, the right to reside in the matrimonial home/shared household was seen as a major breakthrough in women's rights in India.➤ She cannot be evicted from the shared household and can seek immediate relief, a protection order, monetary compensation, a residency order, a custody order, free legal services, medical aid and counseling with the help of the Protection Officer or Service Provider. |

Act	
Who can a woman complain against	<ul style="list-style-type: none"> ➤ A woman can file a complaint against any adult male perpetrator under Section 2 (q) of an act of violence. ➤ In cases where the woman is married or lives in a relationship that is in the nature of marriage, she can also file a complaint against the male or female relatives of the husband/ male partner who have perpetrated the violence.
Meaning Of Domestic Relationship	As per sub-section (f) of section (2) of the Domestic Violence Act, 2005, ' domestic relationship' means the relationship between two persons who live or have, at any point in time, lived together in a shared household, when they are related by consanguinity, marriage, or through a relationship in the nature of marriage, adoption or are family members living together as a joint family,"
Meaning of Relationship in the nature of marriage	'Relationship in the nature of marriage' refers to those relationships where there is no marriage between the parties in the solemnization of a marriage under any law. Yet, the parties represent to the world that they are a couple and there is stability and continuity in the relationship. Such a relationship is also known as a 'common law marriage.'

- Q.73) Nagorno – Karabakh region recently in the news lies in which country ?
- (a) Azerbaijan
 - (b) Iran
 - (c) Russia
 - (d) Turkey

EXPLANATION:

Nagorno-Karabakh is a landlocked mountainous region part of Azerbaijan, but its population is majority Armenian. As the Soviet Union saw increasing tensions in its constituent republics in the 1980s, Nagorno-Karabakh voted to become part of Armenia - sparking a war that stopped with a ceasefire in 1994. **So, Option (a) is correct.**



ADDITIONAL INFORMATION:

NAGORNO-KARABAKH

- Recently in news** The Nagorno-Karabakh territory has been disputed between Armenia and Azerbaijan for years.
- About the Issue**
- Since 1994, Nagorno-Karabakh has remained part of Azerbaijan but is controlled by separatist ethnic Armenians backed by the Armenian government.
 - Until recently, negotiations mediated by international powers had failed to deliver a

peace agreement.

- Armenia is majority Christian while Azerbaijan is majority Muslim.
- Turkey has close ties to Azerbaijan, while Russia is allied with Armenia - although it also has good relations with Azerbaijan.
- It was only as the Soviet Union began to collapse in the late 1980s that Nagorno-Karabakh's regional parliament officially voted to become part of Armenia.
- Azerbaijan sought to suppress the separatist movement, while Armenia backed it.
- This led to ethnic clashes and - after Armenia and Azerbaijan declared independence from Moscow - a full-scale war. Armenian forces gained control of Nagorno-Karabakh and adjacent areas before a Russian-brokered ceasefire was declared in 1994.
- After that deal, Nagorno-Karabakh remained part of Azerbaijan, but since then, has mostly been governed by a separatist, self-declared republic run by ethnic Armenians and backed by the Armenian government.
- It also established the Nagorno-Karabakh Line of Contact, separating Armenian and Azerbaijan forces.
- Peace talks have taken place since then, mediated by the Organization for Security and Co-operation in Europe (OSCE) Minsk Group - a body set up in 1992 and chaired by France, Russia and the United States.
- But clashes continued, and a serious flare-up in 2016 saw the deaths of dozens of troops on both sides.
- The conflict is further complicated by geopolitics.
- NATO member-state Turkey was the first nation to recognize Azerbaijan's independence in 1991.
- Former Azeri President Heydar Aliyev once described the two as "one nation with two states." Both share a Turkic culture and populations.



India's Response

- India responded to reports of fighting by reiterating that bilateral disputes can be solved only by dialogue and diplomacy and not military power.

Q.74) Consider the following statements :

1. The Central Bureau of Investigation, CBI, is a statutory body deriving its powers from the Delhi Special Police Establishment (DPSE) Act, 1946.
2. Section 6 of the DPSE act requires the CBI to obtain the mandatory general consent of a State Government to exercise its powers and jurisdiction.
3. Constitutional courts can entrust to the CBI any case for investigation, in the exercise of inherent jurisdiction, even without the consent of the respective State Government.

Which of the statements given above is/are correct?

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

EXPLANATION:

The Central Bureau of Investigation (CBI) was set up in 1963 by a resolution of the Ministry of Home Affairs, and it is not a statutory body. It derives its power from the Delhi Special Police Establishment Act, 1946 and functions as an attached office of the Ministry of Personnel, Public Grievances and Pensions. **So, Statement 1 is not correct.**

Under section 6 of the Delhi Special Police Establishment shall not conduct any inquiry or investigation into any offence alleged to have been committed under the Prevention of Corruption Act, 1988, unless the consent of the Government of that State. In other words, it requires that the CBI obtain general or specific consent from a state government to register and investigate any case in the State.

Under section 6A of the Delhi Special Police Establishment shall not conduct any inquiry or investigation into any offence alleged to have been committed under the Prevention of Corruption Act, 1988, except with the previous approval of the Central Government where such allegation relates to:

- The employees of the Central Government at the level of Joint Secretary and above.
- The Central Government appoints such officers in corporations established by or under any Central Act, Government companies, societies and local authorities owned or controlled by that Government. **So, Statement 2 is correct.**

Constitutional courts (Supreme Court and High Court) can also entrust any case or class of cases for investigation in the exercise of inherent jurisdiction, even without the consent of the respective State government. Once general or specific consent is granted under Section 6 of the DSPE Act by the State government where the case is registered; or when the Constitutional courts entrust the case, the powers and jurisdiction of members of the DSPE (CBI) may extend for investigation as stipulated under Section 5 of DSPE Act, 1946. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

CENTRAL BUREAU OF INVESTIGATION (CBI)

About

- The Central Bureau of Investigation (CBI) had its genesis in British India when, during the Second World War, the Special Police Establishment (SPE) was set up under the War Department to probe bribery and corruption cases.
- The SPE came into existence in 1941. In 1946, its mandate was expanded under the Delhi Special Police Establishment (DSPE) Act to investigate corruption in Central and State governments, as it were brought under the purview of the Home Department.
- In 1963, the Home Ministry renamed the Special Police Force, the Central Bureau of Investigation, vesting in it the power to probe irregularities in all public sector bodies and also inquire into cases of terrorism, murder, and so on.
- The establishment of the CBI was recommended by the Santhanam Committee on Prevention of Corruption (1962–1964).

Types of

- Anti-Corruption Division - for investigation of cases under the Prevention of

**Crime that
CBI
Investigate**

Corruption Act, 1988 against Public officials and the employees of the Central Government, Public Sector Undertakings, Corporations or Bodies owned or controlled by the Government of India - it is the largest division having a presence almost in all the States of India.

- Economic Offences Division - for investigation of major financial scams and serious economic frauds, including crimes relating to Fake Indian Currency Notes, Bank fraud and Cyber Crime.
- Special Crimes Division - for investigation of serious, sensational and organized crime under the Indian Penal Code and other laws on the requests of State Governments or on the orders of the Supreme Court and High Courts.

NIA Vs. CBI The National Investigation Agency (NIA) was constituted after the Mumbai terror attack in November 2008 mainly for investigation of incidents of terrorist attacks, funding of terrorism and other terror-related crime, whereas CBI investigates the crime of corruption, economic offenses and serious and organized crime other than terrorism.

Q.75) Consider the following pairs :

Sites	States
1. Mahuli temples	- Gujarat
2. Sannati Buddhist site	- Maharashtra
3. Karikiyoor rock paintings	- Kerala

Which of the pair/pairs is/are **not** correctly matched ?

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

EXPLANATION:

Recently, National Monument Authority (NMA) submitted a report on the comprehensive development of the Mahuli group of temples to the Ministry of Culture. The famous group of temples known as Dakshin Kashi comprises five temples from the 11th and 12th CE in the Hemadpanthi style of architecture and are located near Satara, Maharashtra.

So, Pair (1) is not correct.



Recently, An excavation was done by the Archaeological Survey of India (ASI) on the ancient Sannati Buddhist site on the bank of the Bhima river near Kanaganahalli in Kalaburagi district in Karnataka. Sannati and Kanaganahalli were small and ordinary villages on the bank of Bhima till 1986, when the

Kali temple at the Chandralamba temple complex in Sannati collapsed. In clearing the debris, they discovered an Ashokan edict that put the villages on the world map and opened new avenues of historical research on Mauryan Emperor Ashoka and Buddhism in its early years. **So, Pair (2) is not correct.**



Along the Kotagiri slopes, overlooking the confluence of the Moyar and the Bhavani is one of the most remarkable and enigmatic rock art sites in south India. The Karikiyoor rock paintings, a series of over 300 images etched on the cliff face, are believed to be more than 5,000 years old. They are just one of a series of cave and rock paintings that have been rediscovered across the Nilgiris in Tamil Nadu.

Karikiyoor is probably one of the biggest rock art sites in India. A variety of subjects are depicted in great detail, such as “the communities that lived in the area at that time, the wildlife they witnessed and their relationships with them, as well as the battles with other communities, making their way up the hills,”

Local indigenous communities, especially the Irulas and the Kurumbas, have an attachment to the sites, as most of the rock art and cave painting sites are located near the settlements of these aboriginal groups. **So, Pair (3) is not correct.**



- Q.76) Which of the below is the objective of the scheme PM- Jan Vikas Karyakram ?
- (a) To accelerate access to high-quality family planning choices
 - (b) To create a social movement for health, create awareness and encourage healthy lifestyles
 - (c) To target the poorest of poor populations and provide them relief from hunger
 - (d) To address the development deficits of the identified Minority Concentration Areas**

EXPLANATION:

The Pradhan Mantri Jan Vikas Karyakram (PMJVK) is a Centrally Sponsored Scheme, which was restructured and implemented with effect from May 2018 in 1300 identified Minority Concentration Areas (MCAs) of the Country with the objective of developing infrastructure projects, which are community assets, in the identified areas with development deficits for socio-economic development

and basic amenities in these areas.

The Scheme is implemented through the State Governments/ Union Territory Governments. Projects under PMJVK are proposed by the States/ UTs where land is already available with the State/UT. Central Government does not acquire land for construction and land cost or land acquisition costs are not covered under the scheme.

The State Government/UT administration reports the progress to the Ministry of Minority Affairs in respect of each project on a quarterly basis for both physical and financial progress in the form of a Quarterly Progress Report (QPR) prescribed for this purpose.

The PMJVK guidelines also provide for a quarterly meeting by the District Level Committee to review the progress of implementation of the projects under PMJVK and submission of reports to the State Level Committee (SLC). **So, Option (d) is correct.**

ADDITIONAL INFORMATION:

PRADHAN MANTRI JAN VIKAS KARYAKRAM (PMJVK)

Recently in News	The Union Minister of Minority Affairs to the Lok Sabha in March 2022, during the year 2020-21, the Ministry has sanctioned projects worth Rs. 1821.28 crores under PradhanMantri Jan Vikas Karyakram
Expansion of the Scheme	<ul style="list-style-type: none">➤ The areas covered under PMJVK were increased from 90 Districts originally to 308 Districts in 33 States/ UTs w.e.f. May 2018.➤ The MCAs include 870 Minority Concentration Blocks (MCBs), 321 Minority Concentration Towns (MCTs) and 109 Minority Concentration District Headquarters (MCD Hqrs) added for the first time.➤ The scheme has now further been revised for implementation w.e.f from 2022-23 onwards in all Districts of the country, including all the Aspirational Districts.
Beneficiaries	<ul style="list-style-type: none">➤ PMJVK will support the State/UTs in creating infrastructure to improve the quality of life of people and reduce the imbalances in the identified minority concentration areas to be at par with the rest of the country.➤ As far as PMJVK is concerned, the communities notified as minority communities under Section 2 (c) of the National Commission for Minorities Act, 1992 would be taken as Minority Communities. At present 6 (six) communities namely Muslims, Sikhs, Christians, Buddhists, Zoroastrians (Parsis) and Jains have been notified as Minority Communities under Section 2 (c) of the National Commission for Minorities Act, 1992.➤ The Programme aims to address development deficits in the identified minority concentration areas. The identification of minority concentration areas has been done on the basis of presence of substantial population of notified Minority Communities based on Census, 2011.➤ The revised PMJVK will be implemented in all districts of the country including all the Aspirational Districts. The projects under PMJVK will be proposed in any area where the concentration of minority population is more than 25% in the catchment area (15 KM radius).

Q.77) Which of the following are Soil and Water Conservation Methods-Management Practices?

1. Strip Cropping
2. Mulching
3. Contour Cultivation
4. Planting of Grasses
5. Cashew nut Plantation
6. Rotation of Crops

7. Multiple Cropping

Select the correct answer using the code given below :

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

EXPLANATION:

In Strip cropping, Crops may be cultivated in alternate strips parallel to one another. Some strips may be allowed to lie fallow while others are sown to different kinds of crops, e.g., grains, legumes, and small tree crops. The various crops ripen at different times of the year and are harvested at intervals. This ensures that at no time will the entire area be left bare or exposed.

In buffer strip cropping, permanent strips of grasses or legumes or a mixture of grass and legume are grown in highly eroded areas or in areas that do not fit into regular rotation.

Mulch is any organic or non-organic material that is used to cover the soil surface to protect the soil from being eroded away, reduce evaporation, increase infiltration, regulate soil temperature, improve soil structure, and thereby conserve soil moisture.

In Contour cultivation or Contour Bunding, small bunds are constructed across the slopes of the land on a contour. If the ploughing is done at right angles to the hill slope, following the natural contour of the hill, the ridges and furrows break the flow of the water down the hill. This prevents excessive soil loss, as gullies are likely to develop and also reduces run-off.

Cashew, a native crop of Brazil, was introduced in India during the late 16th century for the purpose of afforestation and soil conservation as the crop tended to check soil erosion.

Crop rotation is the practice of growing different types of crops in succession on the same field to get maximum profits from the least investment without impairing soil fertility. Monocropping results in the exhaustion of soil nutrients and depletes soil fertility. The inclusion of legume crops in crop rotation reduces soil erosion, restores soil fertility, and conserves soil and water.

So, Option (c) is correct.

Multiple cropping is taken as being a system in which two or more crops are grown in succession in a rotation with one or more years of legume-based pasture. The widespread adoption of multiple cropping without a corresponding increase in the adoption of soil conservation practices must inevitably lead to widespread and serious erosion. Thus Multiple cropping is not a Soil and Water Conservation Methods.

ADDITIONAL INFORMATION:

SOIL AND WATER CONSERVATION MEASURES

- | | |
|--|----------------------------------|
| Biological Measures | ➤ Contour farming |
| (agronomic/agricultural and agroforestry) | ➤ Choice of crop |
| | ➤ Crop rotation |
| | ➤ Cover crops |
| | ➤ Intercropping |
| | ➤ Strip cropping |
| | ➤ Mulching |
| | ➤ Conservation tillage |
| | ➤ Organic farming |
| | ➤ Local configuration techniques |
| | ➤ Agroforestry measures |
| Mechanical Measures | ➤ Bunding |
| | ➤ Contour trenching |
| | ➤ Terracing |
| | ➤ Contour wattling |

- Crib structures
- Geo-textiles
- Loose boulder/stone/masonry check dams
- Brushwood check dams
- Diversion drains
- Conservation bench terrace

Q.78) The World Happiness Report 2022 is published by :

- (a) **Sustainable Development Solutions Network**
- (b) World Economic Forum
- (c) Welthungerhilfe
- (d) UNDP

EXPLANATION:

World Happiness Report uses global survey data to report how people evaluate their own lives in more than 150 countries worldwide. The World Happiness Report is a publication of UN Sustainable Development Solutions Network publication powered by the Gallup World Poll data.

The World Happiness Report 2022 reveals a bright light in dark times. The pandemic brought not only pain and suffering but also an increase in social support and benevolence. India ranks 136th in the World Happiness Report 2022 (139th in 2021), while Finland becomes the happiest country for the fifth consecutive year.

So, Option (a) is correct.

ADDITIONAL INFORMATION:

ORGANISATION	REPORTS
World Bank	<ul style="list-style-type: none"> ➤ World Development Report ➤ Human Capital Index 2020 ➤ Ease of Doing Business (EoDB) Report ➤ Global Economic Prospects (GEP) Report ➤ Learning Poverty report
International Monetary Fund (IMF)	<ul style="list-style-type: none"> ➤ Global Financial Stability Report ➤ World Economic Outlook ➤ Fiscal Monitor. ➤ Regional Economic Outlook. (Asia and Pacific Region).
World Economic Forum (WEF)	<ul style="list-style-type: none"> ➤ Global Competitiveness Report/Index ➤ Global Social Mobility Index ➤ Global Risks Report ➤ Global Gender Gap Report ➤ Energy Transition Report/Index
World Wide Fund for Nature (WWF)	Living Planet Report
United Nations Environment Programme (UNEP)	<ul style="list-style-type: none"> ➤ Emissions Gap Report 2022. ➤ Adaptation Gap Report 2022. ➤ An Eye on Methane: International Methane Emissions Observatory 2022 Report. ➤ 2022 Global Status Report for Buildings and Construction.
United Nations Educational, Scientific and Cultural Organization (UNESCO)	<ul style="list-style-type: none"> ➤ Global Education Monitoring Report 2021. ➤ UNESCO Science Report 2021. ➤ World Trends in Freedom of Expression and Media Development 2021/2022. ➤ Global Ocean Science Report 2020.

- Re|shaping policies for creativity.
- The United Nations World Water Development Report 2022.

Q.79) Consider the following statements with respect to Africa :

1. It's the only continent stretching to the north, south, east and western hemispheres.
2. Only continent through which the Equator, Tropics and Greenwich Meridian pass.

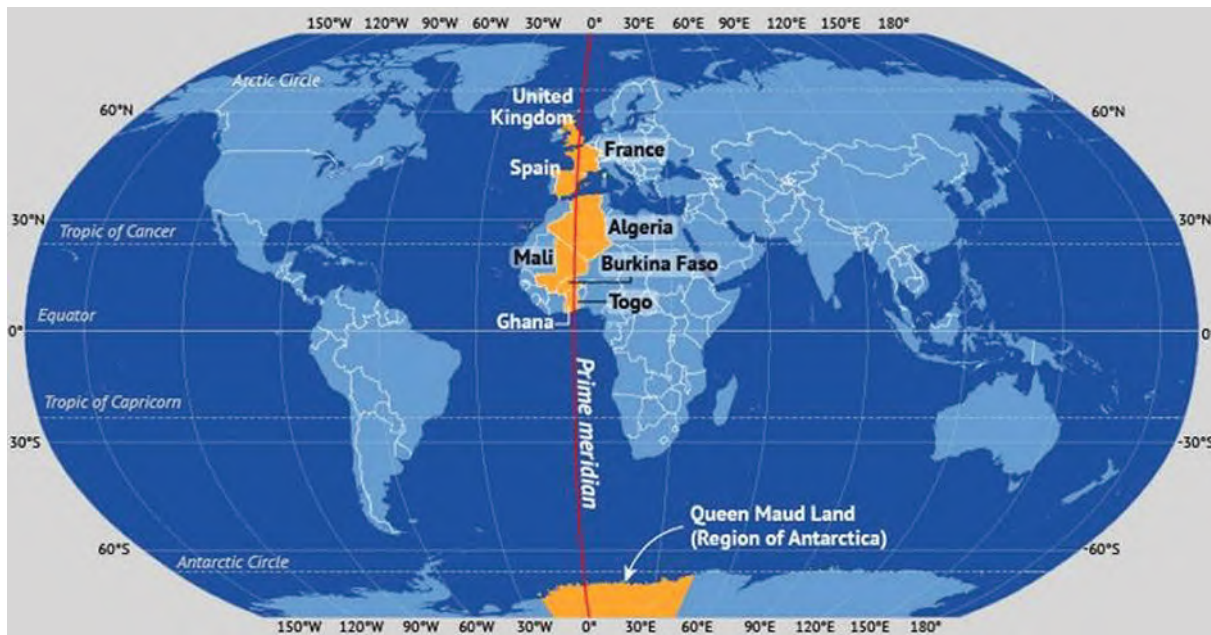
Which of the statements given above is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2**
- (d) Neither 1 nor 2

EXPLANATION:

Africa is the world's second-largest and second-most-populous continent after Asia. Africa straddles the equator and the prime meridian. It is the only continent to stretch from the northern temperate to the southern temperate zones. The majority of the continent and its countries are in the Northern Hemisphere, with a substantial portion and the number of countries in the Southern Hemisphere. Africa becomes the only continent with its landmass in all four hemispheres.

Most of the continent lies in the tropics, except for a large part of Western Sahara, Algeria, Libya and Egypt, the northern tip of Mauritania, and the entire territories of Morocco, Ceuta, Melilla, and Tunisia, which in turn are located above the tropic of Cancer, in the northern temperate zone. **So, Statements 1 and 2 are correct.**





ADDITIONAL INFORMATION:

GEOGRAPHICAL TERMS

- Equator**
- The Equator is an imaginary line equidistant from the North and South Poles. This line falls at zero degrees latitude.
 - A part of the Earth that lies north of the Equator is known as the Northern Hemisphere, whereas the Part of Earth that lies south of the Equator is known as the Southern Hemisphere.
 - The Equator passed through a total of seven countries in Africa. They are the island country of São Tomé and Príncipe, Gabon, the Republic of Congo, the Democratic Republic of the Congo (DRC), Uganda, Kenya, and Somalia.

- Greenwich / Prime Meridian**
- Greenwich meridian, also known as the prime meridian, is an imaginary line that indicates 0° longitude. It passes through Greenwich, a borough of London, and terminates at the North and South poles.
 - The Eastern and Western Hemispheres are divided by zero degrees longitude, known as the Greenwich or Prime Meridian.
 - The Western Hemisphere occupies the geographic space west of the prime meridian and east of the antemeridian, which lies at 180 degrees longitude.
 - The Eastern Hemisphere is found east of the Prime Meridian and west of the antemeridian.
 - Greenwich Meridian crosses through five countries of the African continent. They are Algeria, Mali, Burkina Faso, Togo, and Ghana.

Q.80) Consider the following statements with respect to Prisons in India :

1. In India, the administration and management of prisons are the responsibility of the Union Home Ministry.
2. The jails in the state of Uttar Pradesh have recorded the highest number of under-trials in India.
3. Delhi has reported the highest number of Central jails in the country.

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:

In India, Prison is a State subject under the State List of the Seventh Schedule to the Constitution of India. The management and administration of Prisons fall exclusively in the domain of the State Governments. They are governed by the Prisons Act 1894 and the Prison Manuals of the respective State Governments. Thus, States have the primary role, responsibility and authority to change the current prison laws, rules and regulations.

So, Statement 1 is not correct.

The strength of under trials in Uttar Pradesh prisons is three times more than that of convicts. The under trials constitute nearly 76 percent of the total jail population. Delhi and Jammu and Kashmir (J&K) were found to have the highest ratio of under trials (a person who is being held in custody awaiting trial for a crime) in jails at 91%, followed by Bihar and Punjab at 85%, and Odisha at 83%.

So, Statement 2 is correct.

With a total capacity of 9,346 inmates, Delhi's central jails have the highest occupancy rate of 189.8%, housing 17,736 inmates' two people in each cell.

As Per the Prison Statistics report 2021, Delhi has reported the highest number of Central jails (14) in the country. States/UTs like Arunachal Pradesh, Meghalaya, A & N Islands, DNH & Daman Diu, Ladakh and Lakshadweep have no central jail.

So, Statement 3 is correct.

ADDITIONAL INFORMATION:

NATIONAL CRIME RECORDS BUREAU (NCRB)

- | | |
|------------------|--|
| About | <ul style="list-style-type: none">➤ Crime records play a vital role in the scheme of police working to prevent and detect crime.➤ Police is a State subject under the Indian Constitution; the Central Government through the Ministry of Home Affairs has been assisting and aiding the States in the modernization of the State Police Forces with financial aid and through the constitution of Study Groups, Committees and the formation of central organizations to help States fight the menace of crime more effectively.➤ Prison Statistics report 2021 is been released by National Crime Records Bureau (NCRB). |
| Functions | <ul style="list-style-type: none">➤ To collect and process crime statistics at the National level.➤ To help trace interstate criminals by fingerprint search.➤ To provide training facilities to personnel of the Crime Records bureau.➤ To coordinate, guide and assist the functioning of the State Crime Records Bureau.➤ To advise Central and State Governments on matters related to fingerprints and footprints, and to conduct training courses for finger print experts.➤ To evaluate, develop and modernise crime Records Bureau.➤ To receive from and supply data to penal and correctional agencies for their tasks of rehabilitation of criminals, their remand, parole, premature release etc. |

Ministry It was under the Ministry of Home Affairs.

Q.81) Consider the following pairs :

Country	Reason for being in the news recently
1. Burkina Faso	- Suspension of Constitution and Government by military
2. Uzbekistan	- Death of children due to cough syrup made by an Indian firm
3. Rwanda	- Given "candidate status" by European Union.
4. Bosnia and Herzegovina	- UK has signed a deal to relocate some of its asylum seekers.

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:

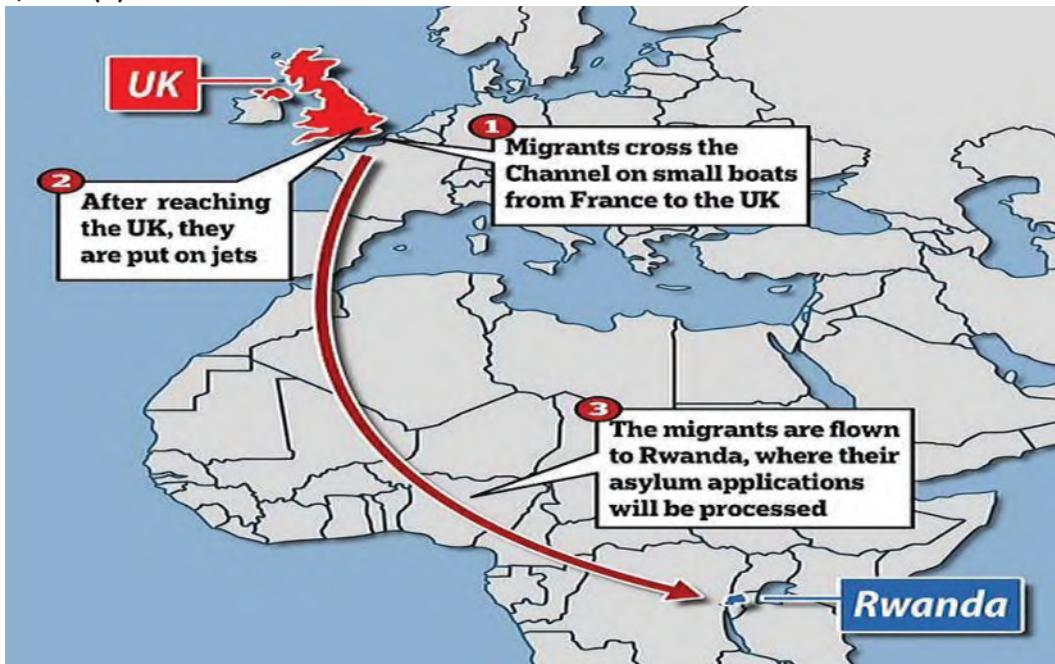
Burkina Faso is a landlocked country in western Africa. Recently, Burkina Faso's Army has announced it has deposed President, dissolved the government and the national assembly, and suspended the Constitution, seizing control of the country after two days of unrest at army camps in the capital. **So, Pair (1) is correct.**



Recently, the Health Ministry of Uzbekistan said 18 children with acute respiratory disease have died from taking excessive doses of a cough syrup, Doc-1 Max, manufactured by Marion Biotech, an Indian firm. The children consumed "excessive amounts" of the cough syrup, which contained ethylene glycol, a substance that ought not to be present in cough syrup. **So, Pair (2) is correct.**



The United Kingdom has signed a deal with Rwanda to send some asylum seekers to the East African nation. Anyone entering the UK illegally may now be relocated to Rwanda. It is essentially part of a wider strategy to bring down the number of people entering the UK by crossing the channel in small boats. **So, Pair (3) is not correct.**



Recently, the European Union unanimously decided in December 2022 to grant the EU 'candidate status' to Bosnia and Herzegovina on the condition that the country implements the steps specified in the Commission's October 2022 communication on enlargement policy to strengthen the rule of law, the fight against corruption and organised crime, migration management and fundamental rights. **So, Pair (4) is not correct.**



Q.82) With reference to SARFAESI Act, 2002, consider the following statements :

1. It enables banks to reduce their non-performing assets through recovery methods and reconstruction.
2. It covers all types of assets, movable or immovable, promised as security to loans.
3. The provisions of this act are not applicable for Non-Performing Asset (NPA) loans with repayment below Rs.1 lakh and loans created for agricultural land.

Which of the statements given above is/are correct ?

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

EXPLANATION:

The SARFAESI Act of 2002 The SARFAESI Act 2002 enables banks to reduce nonperforming assets through recovery methods and reconstruction as it allows banks and other financial institutions for auctioning residential or commercial properties to recover a bad loan when a borrower fails to repay the loan amount. **So, Statement 1 is correct.**

The law is applicable throughout the country and covers all assets, movable or immovable, promised as security to the lender, except those excluded under Section 31 of the Act are covered under the SARFAESI Act 2002. **So, Statement 2 is correct.**

The provisions of this Act apply to outstanding loans above Rs.1 lakh, which are classified as Nonperforming Assets (NPA).

The SARFAESI Act isn't applicable for:

- The NPA loan accounts amount to less than 20% of the principal and interest.
- Money or security issued under the Indian Contract Act or the Sale of Goods Act 1930.
- Any rights of the unpaid seller under Section 47 of the Sale of Goods Act, 1930.
- Any conditional hire-purchase, sale, lease or other contracts in which no security interest has been created.
- Any properties that is not liable to attachment or sale under Section 60 of the Code of Civil Procedure, 1908. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

SARFAESI ACT, 2002

- Recently in News** Banks have invoked the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (Sarfaesi) Act against telecom infrastructure provider GTL to recover their pending dues.
- About**
- This Act may be called the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002.
 - It extends to the whole of India.
 - This Act effectively allows the bank to recover the bad loans of nonperforming assets.
 - Before the law was enacted in December 2002, banks and other financial institutions were forced to take a longer route to recover their bad debts. The lenders would appeal in civil courts or designated tribunals to get hold of 'security interests' to recover defaulting loans, which slowed recovery and added to the growing list of lenders' nonperforming assets.
 - The Act comes into play if borrowers default on their payments for more than six months. The lender can notify the borrower to clear the dues within 60 days.
 - If that doesn't happen, the financial institution can take possession of the secured assets and sell, transfer or manage them.
 - The defaulter, meanwhile, has recourse to move an appellate authority set up under the law within 30 days of receiving a notice from the lender.
 - According to a 2020 Supreme Court judgment, cooperative banks can also invoke Sarfaesi Act. According to the Finance Ministry, non-banking financial companies (NBFCs) can initiate a recovery in Rs 20 lakh loan default cases.
 - This Act covers all assets, movable or immovable, promised as security to the lender.
 - Rights of the Borrowers can be,
 - Borrowers can remit the dues and avoid losing their securities before the sale is concluded.
 - Borrowers will get compensation for the default of an officer.
 - SARFAESI Act Section 17 provides that borrowers can approach the Debt Recovery Tribunal to rectify their grievances against the creditor or authorized officer.

- Q.83) Cyclopean wall, recently seen in the news, was built in order to protect a famous ancient city of ?
- (a) Madurai
 - (b) Hampi
 - (c) Rajgir**
 - (d) Varanasi

EXPLANATION:

The Cyclopean Wall of Rajgir is a 40 km long stone wall that encircled the ancient city of Rajgir to protect it from external enemies and invaders, built before the 3rd century BC. Recently, the Government of Bihar sent a proposal to the Archaeological Survey of India to get the Cyclopean Wall of Rajgir listed as a UNESCO world heritage site. The Cyclopean Wall of Rajgir was erected by the Brihadratha (rawani) Dynasty rulers using massive undressed stones. The walls are also mentioned in Buddhist works. The ancient city of Rajgir was the capital city of King Bimbisara and his son Ajatashatru who were contemporaries of the Buddha. The traces of a fortified wall are found around the city. This wall was built with massive undressed stones fitted together, having a width of about 14'. It is popularly called

the Cyclopean wall for its similarities with ancient Greek walls. Bastions were built at intervals to strengthen the wall.

According to Pali texts, there were 32 large gates and 64 smaller ones to enter the fortified city. A considerable part of this massive ancient wall running up along the Ratnagiri hill is still there, starting from the base of the hill towards the hillside.

The Cyclopean Wall at Rajgir is believed to be similar to "Frontiers of the Roman Empire," which runs through Germany, the UK and Northern Ireland and was included in UNESCO's world heritage list in 1987. **So, Option (c) is correct.**



ADDITIONAL INFORMATION:

MAGADHA EMPIRE

About

- Magadha had two very powerful rulers, Bimbisara and Ajatasattu, who used all possible means to conquer other janapadas.
- Mahapadma Nanda was another important ruler. He extended his control up to the north-west part of the subcontinent. Rajagriha (present-day Rajgir) in Bihar was the capital of Magadha for several years. Later the capital was shifted to Pataliputra (present-day Patna).
- In a gana or a sangha there were not one, but many rulers. Sometimes, even when thousands of men ruled together, each one was known as a raja. These rajas performed rituals together. They also met in assemblies, and decided what had to be done and how, through discussion and debate. However, women, dasas and kammakaras could not participate in these assemblies. Both the Buddha and Mahavira belonged to ganas or sanghas.
- Rajas of powerful kingdoms tried to conquer the sanghas. Nevertheless, these lasted for a very long time, till about 1500 years ago, when the Gupta rulers conquered the last ganas or sanghas.
- Ajatasattu wanted to attack the Vajjis. He sent his minister, Vassakara, to the Buddha to get his advice.
- The Buddha asked whether the Vajjis would frequently meet in full assemblies. When he heard that they did, he replied that the Vajjis would continue to prosper as long as:
 - They held full and frequent public assemblies.
 - They met and acted together.

- They followed established rules.
- They respected, supported and listened to elders.
- Vajji women were not held by force or captured.
- Chaityas (local shrines) were maintained in both towns and villages.
- Wise saints who followed different beliefs were respected and allowed to freely enter and leave the country.

Q.84) Rule of law is seen as an integral part of good governance. Which of the following principles are believed to aid 'Rule of Law' in a State ?

1. Equality before law
2. Binding written constitution
3. Independent judiciary
4. Laws of ambiguous language
5. Judicial review
6. Supremacy of law
7. Parliamentary sovereignty

Select the correct answer from the codes given below :

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

EXPLANATION:

The term 'Rule of Law' is nowhere defined in the Indian Constitution, but the Indian judiciary often uses this term in its judgments. The Supreme Court has declared the rule of law as one of the basic features of the Constitution, so it cannot be amended even by constitutional amendment. The rule of law is seen as an integral part of good governance.

The rule of law means that no man is above the law and also that every person is subject to the jurisdiction of ordinary courts of law irrespective of their position and rank.

Principles believed to aid the 'Rule of Law' in a State are as follows:

- Equality before law
- Binding written Constitution
- Independent judiciary
- Judicial review
- Supremacy of law. **So, Option (c) is correct.**

Ambiguous language is defined as language that can be understood in more than one way, refers to two or more things simultaneously, lacks clarity and definiteness, or is difficult to understand or doubtful of import. Thus, Ambiguous language does not aid the rule of law of a nation. **So, Statement 4 is not correct.**

Parliamentary sovereignty, also called parliamentary supremacy or legislative supremacy, means that parliament is superior to the executive and judicial branches of government and can enact or repeal any law it chooses. It holds that the legislative body has absolute sovereignty and is supreme over all other government institutions. Thus, Parliamentary sovereignty does not aid the rule of law of a nation. **So, Statement 7 is not correct.**

ADDITIONAL INFORMATION:

RULE OF LAW

- About**
- The rule of law, also known as supremacy law, means that no one (including the government) is above the law, the law is above everyone, and it applies to everybody.
 - The term 'the rule of law is derived from the French word 'le principe de legalite',

which means 'the principle of legality'.

- The rule of law is a legal principle that law should govern a nation and not arbitrary decisions by individual government officials.
- The rule of law is a set of principles, or ideals, for ensuring an orderly and just society. There are three major elements of the rule of law;
 - Supremacy of the law
 - Equality before the law
 - The predominance of legal spirit: the court should be free from impartiality and external influence.
- The first and the second elements are applicable to the Indian System and not the third one. In the Indian System, the constitution is the source of individual rights.

Principles of Rule of Law

- Accountability

The government, its officials, its agents, individuals and private entities are accountable under the law.

- Just law

The laws are clear, publicized, stable and just; are applied evenly; and protect fundamental rights, including the security of the persons and property.

- Open Government

The process by which the law is enacted, administered and enforced is accessible, fair and efficient.

- Access and impartial justice

Justice is to be delivered timely by competent, ethical, and independent representatives and neutrals.

Q.85) The large Lake Razzaza in the news recently is located in which country ?

- (a) Iran
- (b) Iraq**
- (c) Syria
- (d) Jordan

EXPLANATION:

Lake Razzaza, also known as Lake Milh (Arabic for Salt Lake), is the second-largest Lake (man-made) in Iraq and is part of a wide valley that includes the lakes of Habbaniyah, Tharthar and Bahr al-Najaf. The Lake was constructed to control floods in the Euphrates and to be used as a huge reservoir for irrigation purposes. It was completed in the 1970s to receive excess water from Habbaniya Lake during flood season via drainage canals.

A combination of ongoing upstream dam projects and sporadic droughts that reduce annual rainfall impact Lake Razzaza. **So, Option (b) is correct.**



ADDITIONAL INFORMATION:

LAKE RAZZAZA

Recently in News

One of Iraq's largest lakes, the man-made Razzaza, is seeing a significant decline in water levels and has been hit by pollution and high salinity levels.

- About**
- Lake Razzaza Emerges as a pristine stretch of blue beside the desert road running from the shrine city of Karbala toward Iraq's border with Saudi Arabia.
 - Razzaza Lake is the latest victim of a water crisis in Iraq, known as the "Land between the Two Rivers," the Tigris and the Euphrates.
 - Upstream dams in Turkey, Syria and Iran have shrunk the rivers and their tributaries, seasonal rainfall has dropped, and infrastructure has fallen into disrepair.
 - It has been affected not only by the water shortage but by drought, neglect and increased evaporation during Iraq's hot summers.
 - It has also been hit by pollution due to the diversion of sewage water into the Lake and the theft of water quotas allocated to it.
- Iraq**
- Iraq is a Middle Eastern state located in the Gulf between Iran and Saudi Arabia.
 - The country's heartland, known since ancient times as Mesopotamia, is between Iraq's two great rivers, the Tigris and the Euphrates.
 - Iraq has a short coastline on the Persian (Arabian) Gulf between Iran and Kuwait.
 - The many lakes in central Iraq are fed largely by the flooding of the Tigris and the Euphrates Rivers and streams and canals from these rivers.
 - As a result, the lakes vary considerably in volume and area, depending on the flow of the rivers.
 - In general, the largest are Ath-Tharthār, Ar-Razzāzah, and HawralHabbāniyah.
 - South of Baghdad, the lakes tend to be increasingly saline, reflecting the heavy silt content of the two great rivers and the poor drainage in this region.



Q.86) In recent times, Europe's most important waterway, the Rhine river, is at a record low, making it too shallow for many ships to pass. The river passes through which of the below countries ?

1. Switzerland
2. Germany
3. Austria
4. Liechtenstein
5. France
6. Netherlands

Select the correct answer from the codes given below :

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

EXPLANATION:

The Rhine is one of the longest and most important rivers in Europe. It runs for over 1,232 km (766 mi) from its source the in the Swiss Alps (in Switzerland), issuing from the Rheinwaldhorn Glacier 3,353m above sea level.

Flowing through six countries, the Rhine River has served as a link between southern and northern Europe since Roman times. The Rhine flows through the countries of Switzerland, the Principality of Liechtenstein, Austria, Germany, France and the Netherlands.

So, Option (d) is correct.



ADDITIONAL INFORMATION:

Rhine River

Recently in news

In August 2022, water levels on the Rhine River, Europe’s second-largest, continued to fall due to soaring temperatures and a lack of rainfall. The low water levels are preventing many vessels from navigating through the waters at full capacity. The Copernicus Sentinel-2 mission captured satellite images of part of the Rhine River near Cologne. They show the stark difference between August 2021 and August 2022. Flowing from the Swiss Alps to the North Sea, the Rhine River is an important shipping route for many products, from grains to chemicals to coal. When water levels drop, cargo vessels need to sail with a reduced load, so they don’t run aground.

Length

Approximately 1,230 kilometers / 765 miles

Source

Mountain brooks in the Swiss Alps

Mouth

North Sea

Tributaries

- Moselle: Travels southwest from Koblenz to France
- Neckar: Travels southeast from Mannheim to Heidelberg
- Main: Travels southeast from Mainz to Frankfurt

UNESCO World

- Netherlands: Defense Line (to control the waters) & 17th-century Canal Ring, Amsterdam

Heritage Sites in the Rhine River Region

- Belgium: La Grande-Place & Major Town Houses of Victor Horta, Brussels; Plantin-Moretus Museum, Antwerp
- France: Grande île, Strasbourg
- Germany: Speyer Cathedral; Wurzburg Residence; Roman Monuments, Trier; Town of Bamberg; Cologne Cathedral; Upper Middle Rhine Valley
- Luxembourg: City of Luxembourg Old Quarters & Fortifications

Q.87) Which of the following statements best describes the term ‘Veblen goods’ ?

- (a) It is a type of luxury good for which the demand increases as the price increases.

- (b) It is a type of consumer good for which demand decreases as the price increases.
- (c) It is a type of luxury good for which the demand decreases as the price increases.
- (d) It is a type of consumer good that is not necessary to be purchased before their consumption.

EXPLANATION:

Veblen goods are typically high-quality, well-made items that are exclusive and serve as a status symbol in the practices of conspicuous consumption. A good for which demand increases when its price increases, and vice versa.

The law of demand holds that the relationship between a price change and a quantity change is inverse. This holds true for normal goods. Sometimes, it is found that both price and quantity changes are in the same direction. Actually, people consuming such goods are not rich. These goods are called Giffen goods (in honour of Robert Giffen, who first observed it).

Similarly, Thorstein Veblen observed that high prices attract certain rich people to demand those goods as their possession gives them distinction or exclusivity. He called such consumption 'conspicuous consumption'. Such goods are referred to as Veblen goods.

The demand curve for a Veblen good is upward-sloping, contrary to a normal demand curve, which is downward-sloping. **So, Option (a) is correct.**



ADDITIONAL INFORMATION:

ECONOMIC CONCEPTS RELATED TO GOODS

Substitute Goods

- Substitute goods are those goods that can easily be used in place of one another for the satisfaction of a particular want, like tea and coffee.
- An increase in the price of a substitute good leads to an increase in demand for the given commodity, and a decrease in the price of a substitute good leads to a decrease in demand for the given commodity.
- It means demand for a given commodity is directly affected by the change in the price of substitute goods. For example, if the coffee price increases, the tea demand will rise as tea will become relatively cheaper than coffee.

Complementary good

- Complementary goods, like cars and petrol, are used together to satisfy a particular want. An increase in the price of complementary goods leads to a decrease in demand for the given commodity, and a decrease in the price of complementary goods leads to an increase in demand for the given commodity.
- For example, if the price of petrol falls, the demand for cars will increase as it will be relatively cheaper to use both goods together. So, demand for a given commodity is inversely affected by the change in the price of complementary goods

Law of demand

The law of demand states that other things remaining the same; the quantity demanded of a commodity is inversely related to its price. In other words, demand for a commodity rises when its price falls, and its demand falls when it rises, provided other factors remain unchanged.

In the law of demand, all other factors except the commodity's price are assumed to

be constant. Therefore, we use the phrase 'other things remaining same. This phrase is used to cover the following assumptions on which the law is based:

- Prices of substitute goods do not change.
- Prices of complementary goods do not change.
- The income of the buyer remains the same.
- There is no change in the tastes and preferences of the buyer.

EXCEPTION TO THE LAW OF DEMAND

- Giffen Goods**
- The term is coined after the name of the late Scottish economist Sir R. Giffen in the 1800s. The focus of such goods is on non-luxury products with few substitutes.
 - There is a striking difference between Giffen goods and Veblen goods. Giffen goods, as said earlier, focus on non-luxury items, whereas Veblen goods only focus on luxury items.
 - Giffen goods are a special type of inferior goods in which the negative income effect is stronger than the negative substitution effect. Giffen goods do not follow the law of demand as their demand rises when their price rises.
 - Examples of Giffen goods are Rice and Wheat, the staple food options for most parts of the world. Therefore, even an increase in their price could not allow other products as its substitute.

Necessities Commodities such as medicines, salt, wheat etc., do not follow the law of demand because we have to purchase them in minimum required quantity, whatever their price.

Goods Expected to be Scarce When buyers expect a scarcity of a particular good shortly, they start buying more and more of that good even if their prices are rising. For example, during the war, famines etc., people tend to buy more of some goods even at higher prices due to fear of their scarcity soon.

- Q.88) “Critical mineral investment partnership,” sometimes seen in the news, is a partnership between India and :
- (a) Mongolia
 - (b) Kazakhstan
 - (c) **Australia**
 - (d) Kyrgyzstan

EXPLANATION:

During his visit to Australia in July 2022, the Union Minister of Coal and Mines aimed to build on the Memorandum of Understanding (MoU) signed between Khanij Bidesh India Limited (KABIL), a joint venture of three CPSEs under the Ministry of Mines, and Critical Minerals Facilitation Office (CMFO), Government of Australia, which aims at strengthening bilateral trade relationship and lays the path to deliver on a shared ambition to develop secure, robust and commercially viable critical minerals supply chains.

The India-Australia Critical Minerals Investment Partnership envisages joint investment for viable lithium and cobalt projects in Australia, which is critical for India’s transition towards clean energy ambitions. The steps will complement India’s mineral security for E-mobility initiatives and other diversified sectors entailing the usage of critical and strategic minerals. **So, Option (c) is correct.**

ADDITIONAL INFORMATION:

CRITICAL MINERALS

About	Critical minerals are elements that are the building blocks of essential modern-day technologies and are at risk of supply chain disruptions. These minerals are now used everywhere, from making mobile phones and computers to batteries, electric vehicles and green technologies like solar panels and wind turbines. Based on their individual needs and strategic considerations, different countries create their own lists.
Rare Metals, and Metalloids, and Rare-Earth Elements	<ul style="list-style-type: none"> ➤ Rare Metals and Metalloids (RMs) are often confused with Rare Earth Elements (REEs). Rare Metals and Metalloids (RMs) share some common features, but they are seldom found together with Rare Earth Elements (REEs). ➤ Metalloids exhibit properties in between or that are a mixture of metal and non-metal. Metalloids have a metallic appearance, but they are brittle. Chemically, they mostly behave as non-metals and can form alloys with metals. ➤ The RMs are tantalum, columbium (niobium), cobalt, zirconium, indium, gallium, and lithium. They are also considered critical or strategic metals due to their use and importance in energy and technology applications. ➤ Rare-Earth Element (REE) is a group of 17 chemical elements in the periodictable, consisting of lanthanides which comprise 15 chemically similerelements, as well as scandium and yttrium. Since scandium and yttrium havechemical properties similar to lanthanides, they are also included under REE. ➤ The 17 Rare-Earth Elements (Table 12.4) are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y). They are often found in minerals with thorium (Th), and less commonly with uranium (U).
Demand for Critical Minerals in India	<ul style="list-style-type: none"> ➤ Demand for critical minerals in India is expected to grow due to the increased thrust of Govt. of India towards "make in India" and "Smart City" programme, Atmanirbhar Bharat, 100 GW target for Renewable Energy, The Production Linked Incentive Scheme (PLI) schemes for the Consumer electronics industry, accelerated growth for electric vehicles etc. and which will drive the demand of critical minerals in the country. ➤ Critical minerals are essential to Electric Vehicles technology and its supporting infrastructure, and the increase in electric vehicles in the market will have a substantial impact on critical minerals demand.
Reasons for the Criticality of these Resources	<ul style="list-style-type: none"> ➤ As countries around the world scale up their transition towards clean energy and a digital economy, these critical resources are key to the ecosystem that fuels this change. Any supply shock can severely imperil the economy and strategic autonomy of a country over-dependent on others to procure critical minerals. ➤ But these supply risks exist due to rare availability, growing demand and complex processing value chain. Many times the complex supply chain can be disrupted by hostile regimes or politically unstable regions.

- Q.89) Lokpal has jurisdiction to enquire into allegations of corruption against which of the following ?
1. Prime Minister
 2. Member of Parliament
 3. Own members of Lokpal
 4. Any society or trust, or body that receives foreign contribution above Rs. 1 lakh.
 5. Officials of the Union government under Groups A, B, C and D

Select the correct answer from the code given below :

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

EXPLANATION:

The Lokpal has jurisdiction to inquire into allegations of corruption against anyone who is or has been Prime Minister, a Minister in the Union government, or a Member of Parliament, as well as officials of the Union Government under Groups A, B, C and D. Also covered are chairpersons, members, officers and directors of any board, corporation, society, trust or autonomous body either established by an Act of Parliament or wholly or partly funded by the Union or State government. It also covers any society, trust, or body that receives foreign contributions above ₹10 lakhs.

Lokpal is a body created from the Lokpal and Lokayuktas Act, 2013 (the act of the parliament). It can enquire about its members in the body. **So, Option (c) is correct.**

ADDITIONAL INFORMATION:

THE LOKPAL AND LOKAYUKTAS ACT, 2013

About

- The Lokpal of India is committed to addressing the concerns and aspirations of the citizens of India for clean governance. It shall make all efforts within its jurisdiction to serve the public interest and endeavor to use its powers to eradicate corruption in public life.
- India is a signatory to the United Nations Convention against Corruption. The commitment of the Government to provide clean and responsive governance is reflected in the passing of the legislation and creation of the body of Lokpal to contain and punish acts of corruption.
- An Act to establish a Lokpal body for the Union and Lokayukta for States to inquire into allegations of corruption against certain public functionaries and for matters connected in addition to that or incidental to it.
- Regarding Central government servants, the Lokpal shall refer the complaints to the Central Vigilance Commission (CVC). The CVC will send a report to the Lokpal regarding officials falling under Groups A and B and proceed as per the CVC Act against those in Groups C and D.
- Lokpal will have the power of superintendence and direction over any central investigation agency, including CBI, for cases referred to them by the Lokpal.
- The administrative expenses of the Lokpal, including all salaries, allowances and pensions payable to or in respect of the Chairperson, Members or Secretary or other officers or staff of the Lokpal, shall be charged upon the Consolidated Fund of India and any fees or other moneys taken by the Lokpal shall form part of that Fund.
- The Lokpal to consist of a Chairperson with a maximum of 8 members of which 50% shall be judicial members. 50% of the members of the Lokpal shall come from amongst the SCs, the STs, the OBCs, minorities and women.

Q.90) Consider the following statements :

1. Himachal Pradesh becomes the first smoke-free state in India with 100% LPG connections in each house.
 2. Uttar Pradesh, West Bengal and Bihar are the top three beneficiaries of PM Ujjwala Yojana.
- 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:

In April 2022, Himachal Pradesh became the first Smoke-free state in India.

This milestone was achieved due to the effective implementation of the Central Government's Pradhan Mantri Ujjwala Yojana (PMUY) and the Himachal Grihini Suvidha Scheme of the Himachal Pradesh Government.

Now, 100% of Households in the State of Himachal Pradesh have LPG connections in their houses. **So, Statement 1 is correct.**

Women in the states of Uttar Pradesh, West Bengal, Bihar, Madhya Pradesh and Rajasthan have been the biggest beneficiaries of PMUY. **So Statement 2 is correct.**

State	In Lakhs
Uttar Pradesh	147.8
West Bengal	88.8
Bihar	85.7
Madhya Pradesh	71.8
Rajasthan	63.9
Odisha	47.5
Maharashtra	44.4
Assam	34.9
Jharkhand	32.9
Tamil Nadu	32.4

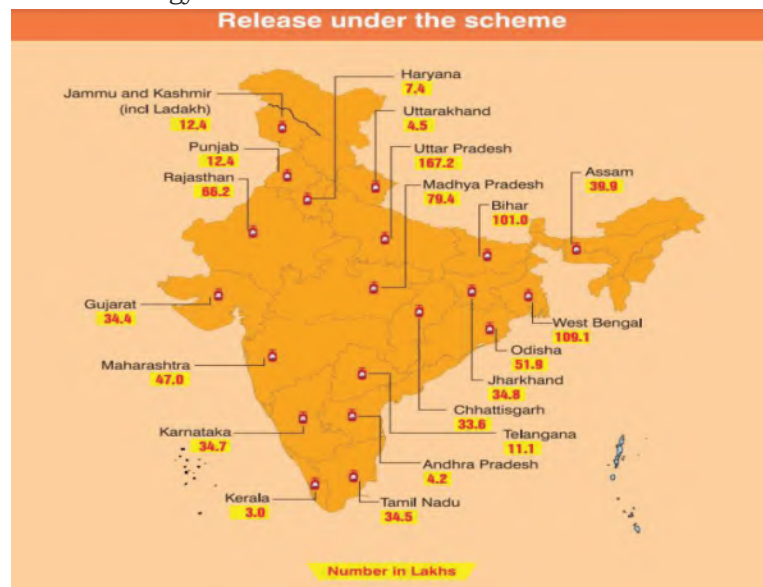
ADDITIONAL INFORMATION:

PRADHAN MANTRI UJJWALA YOJANA (PMUY)

- Launch** ➤ PMUY was launched on May 01, 2016.
➤ Ujjwala 2.0 was launched on August 10, 2021.
- Aim** To safeguard the health of women and children by providing them with clean cooking fuel so that they don't have to compromise their health in smoky kitchens.
- Scheme** ➤ Deposit-free LPG connection is given to the eligible household with financial assistance of Rs 1,600 per connection.
➤ Free of cost first LPG refill and gas stove is provided for the first time by public sector Oil Marketing Companies (OMCs).
- Target** ➤ The initial target was to provide LPG connections to Five crore women members of BPL households.
➤ Subsequently, the scheme was expanded, and the target was revised to Eight crore LPG connections.
➤ To cover remaining households under PMUY, Ujjwala 2.0 was started on August 10, 2021, on a pan-India basis to provide an additional one crore LPG connections.
➤ As on January 31, 2022, the government has achieved the target of providing One crore LPG connections under Ujjwala 2.0.
➤ Based on a large number of applications, the Government has further extended the scheme with 60 Lakh more connections under Ujjwala 2.0.
- Achievements** ➤ The target of Eight Crore deposit-free LPG connections was achieved in September 2019, seven months ahead of the scheduled date.
➤ The 8th crore PMUY connection was handed over by PM Narendra Modi on September 07, 2019.
➤ The target of releasing another One Crore LPG connection under Ujjwala 2.0 was achieved on January 31, 2022.
➤ LPG coverage in India has improved to 104.1% as on January 01, 2022, as

compared to 62% as on May 01, 2016.

- Per capita consumption of PMUY beneficiaries has increased from 3.01 refills in 2019-20 to 3.66 refills in Financial Year 2021-22 (till Feb 2022).
- With the implementation of PMUY, approx. One lakh people have got employment through the LPG distribution system.
- As part of the Pradhan Mantri Garib Kalyan Package, more than 14 Crore free LPG refills were provided to the PMUY beneficiaries during COVID-19.
- Under the Give-It-Up initiative, more than one crore people themselves gave up the subsidy on LPG, which benefited the needy people.
- All LPG connections are released in the name of an adult woman from the poor family.
- 35.1 % of PMUY beneficiaries are from SC/ST categories (as on December 01, 2021)
- International Energy Agency said it is a “major achievement” in improving the environment and health of women.
- WHO report (2018) said that UjjwalaYojana had provided 37 million women living below the poverty line with free LPG connections to support them to switch to clean household energy use.



Q.91) In which of the following context does the Vesak festival celebrated ?

- It is celebrated in temples dedicated to goddesses Kali or Durga in Kerala.
- It is celebrated by Vaishnavas by preparing a variety of food to feed Krishna.
- It is a fair held in Karnataka once in two years by making an offering to the deity for the fulfillment of a wish.

(d) It is celebrated to mark the birth of Gautama Buddha, the founder of Buddhism.

EXPLANATION:

Vesak is one of the most important Buddhist festivals. It is also known as Wesak or Buddha Jayanti or Buddha Purnima or Buddha Day. It is a celebration of Buddha's birthday and, for some Buddhists, marks his Enlightenment (Nirvana - when he discovered truth about life and stops being reborn). It is also a time to reflect on his teachings and what it means to be a Buddhist.

The lunar month of Vaisakha is considered the month of the Buddha's birth and derives from the Pali term vesākha or the Sanskrit word vaiśākha. **So, Option (d) is correct.**

ADDITIONAL INFORMATION:

VESAK FESTIVAL

- About**
- Buddhists do not believe in a single god who created the world and everything in it.
 - In fact, most Buddhists believe in the teachings of a man called Siddhartha Gautama - also known as the Buddha.
 - Siddhartha is believed to have been a prince who was born into a wealthy family in what is now called Nepal in the 5th Century BC.
 - It's believed that Siddhartha Gautama realised that wealth and luxury did not guarantee happiness. So he traveled as a homeless holy man to learn more about the world and see the suffering in the world.
 - It's believed that after six years of studying and meditation on his travels, he became spiritually aware and reached his goal of finding meaning in life. This is called enlightenment.
 - At this time, he became the Buddha, and for the rest of his life, he taught the followers of his experiences.
 - Buddha is a title, rather than a name, which means the enlightened or awakened one
 - Vesak is celebrated once a year. This year, it falls on Monday, 16 May.
 - The date of Vesak changes each year as it takes place at the time of the first full moon of the ancient lunar month of Vesakha, which usually falls in May or early June.



- Q.92) Consider the following statements with reference to Open Network for Digital Commerce :
- (a) It promotes open networks for all aspects of the exchange of goods and services over digital or electronic networks.
 - (b) It helps in curbing digital monopolies by supporting micro, small and medium enterprises and small traders.
 - (c) It is an initiative under the Ministry of Electronics & Information Technology.
- Which of the statements given above is/are correct ?
- (a) **1 and 2 only**
 - (b) 2 only
 - (c) 1 only
 - (d) 1, 2 and 3

EXPLANATION:

Open Network for Digital Commerce (ONDC) is an initiative aiming at promoting open networks for all aspects of the exchange of goods and services over digital or electronic networks. ONDC is to be based on open-sourced methodology, using open specifications and open network protocols independent of any specific platform.

The foundations of ONDC are to be open protocols for all aspects of the entire chain of activities in the exchange of goods and services, similar to hypertext transfer protocol (HTTP) for information exchange over the internet, simple mail transfer protocol (SMTP) for the exchange of emails, and unified payments interface (UPI) for payments. **So, Statement 1 is correct.**

The open protocols would be used for establishing public digital infrastructure in the form of open registries and open network gateways to enable the exchange of information between providers and consumers.

Providers and consumers can use any compatible application of their choice to exchange information and carry out transactions over ONDC. In this way, ONDC aims to create new opportunities and helps to curb digital monopolies by supporting micro, small and medium enterprises and small traders. **So, Statement 2 is correct.**

Open Network for Digital Commerce (ONDC) is an initiative of the Department of Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce, Government of India, to create a facilitative model to revolutionize digital commerce, giving greater thrust to penetration of retail e-commerce in India. **So, Statement 3 is not correct.**

ADDITIONAL INFORMATION:

OPEN NETWORK FOR DIGITAL COMMERCE (ONDC)

- | | |
|-------------------------------------|---|
| Recently in News | <ul style="list-style-type: none">➤ In Dec 2022, the Secretary of the Department for Promotion of Industry and Internal Trade (DPIIT) inaugurated the ONDC office in New Delhi.➤ On this occasion, the Secretary said that India had taken the path of building the public digital infrastructure for serving her citizens and UPI, Jan Dhan, Aadhaar, CoWin and Unified Logistics Interface Platform (ULIP) are examples of this approach. |
| Incorporation | <ul style="list-style-type: none">➤ He emphasized that ONDC is a similar initiative with tremendous potential.➤ With the vision to create an organization with a startup mindset supported by the government, 'Open Network for Digital Commerce' was incorporated as a non-profit, Section-8 company on 31st December 2021.➤ The company was incubated at the Quality Council of India (QCI), an autonomous organization with DPIIT, where the founding work for the project was initiated in a mission mode. QCI was joined by Protean as the co-founder for the incorporation of ONDC.➤ Many public and private banks and financial institutions have contributed equity to ONDC till now. With an authorized capital of 500 Crore, ONDC already has commitments of Rs 230 Crore with a paid-up capital of Rs 180 Crore.➤ An Advisory Council has been in place since June 2021, with participation from the government and industry. With the growth of the company, 12 board members have joined the company, including three government nominees from the Ministries of Commerce and Industry (DPIIT), MSME and Consumer Affairs. |
| Major Objectives | <ul style="list-style-type: none">➤ Democratisation and decentralization of eCommerce.➤ Inclusivity and access for sellers, especially small and medium enterprises as well as local businesses.➤ Increased choices and independency for consumers. |
| Beta Testing and Coming Live | <p>ONDC's Beta testing phase in the city of Bengaluru was the first step in operationalizing a network approach to e-commerce as an alternative to a platform-centric approach. This will make the e-Commerce landscape more inclusive,</p> |

accessible and experience-driven for all consumers and sellers.

As part of the Beta testing phase, the network went live to public users in Bengaluru in Grocery and F&B categories on 30th September 2022.

Q.93) With reference to the Financial Stability Board (FSB), consider the following statements :

1. FSB is an international body that monitors and makes recommendations about the global financial system.
2. It was established under the aegis of the IMF and World Bank.
3. It is headquartered in Basel, Switzerland.

Which of the statements given above is/are correct ?

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

EXPLANATION:

Financial stability board (FSB) was established in 2009 under the aegis of G20 by bringing together the national authorities, standard-setting bodies and international financial institutions to address vulnerabilities and develop and implement strong regulatory, supervisory and other policies in the interest of financial stability.

The FSB, also known as a global watchdog, has no law-making powers but its members commit to applying its regulatory principles in their own jurisdictions. The FSB has an influential role in setting international norms. It wrote the current rulebook for the financial markets in the wake of the 2008 financial crisis.

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

FSB is Hosted and funded by the Bank for International Settlements under a five-year renewable service agreement.

The Financial stability board (FSB) is based in Basel, Switzerland, and is established as a not-for-profit association under Swiss law. **So, Statement 3 is correct.**

ADDITIONAL INFORMATION:

FINANCIAL STABILITY BOARD (FSB)

Recently in News	In July 2022, the FSB said that it would propose "robust" global rules for cryptocurrencies in October 2022. The FSB had said the current turmoil had highlighted the need to regulate the "speculative" sector.
Membership and Leadership	The FSB has 71 member institutions, comprising ministries of finance, central banks, and supervisory and regulatory authorities from 25 jurisdictions, as well as 13 international organizations and standard-setting bodies and 6 Regional Consultative Groups, reaching out to 65 other jurisdictions around the world.
Member Countries	Argentina, Australia, Brazil, Canada, China, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Switzerland, Turkey, United Kingdom, United States
Organizations	<ul style="list-style-type: none">➤ Bank for International Settlements➤ ECB Banking Supervision➤ European Central Bank➤ European Commission➤ International Monetary Fund➤ Organisation for Economic Co-operation and Development➤ The World Bank
Standard-	<ul style="list-style-type: none">➤ Basel Committee on Banking Supervision

Setting Bodies	<ul style="list-style-type: none"> ➤ Committee on Payments and Market Infrastructures ➤ Committee on the Global Financial System ➤ International Association of Insurance Supervisors ➤ International Accounting Standards Board ➤ International Organization of Securities Commissions
India and Financial Stability Board (FSB)	<ul style="list-style-type: none"> ➤ India is an active Member of the FSB, having three seats in its Plenary represented by the Secretary (EA), Deputy Governor-RBI and Chairman-SEBI. ➤ Regular interaction with FSB takes place through periodic conference calls and meetings. Information is exchanged with FSB member jurisdictions frequently as per international requirements. ➤ The FSDC Secretariat in the Department of Economic Affairs coordinates with the various financial sector regulators and other relevant agencies to represent India's views with the FSB.
Priority Areas of Work and New Initiatives	<p>The FSB's work priorities reflect that financial challenges are global in nature and affect the financial system as a whole. These challenges include digitalization, climate change, and shifts in the macroeconomic and interest rate environment.</p> <ul style="list-style-type: none"> ➤ Supporting international cooperation and coordination on current financial stability issues. ➤ Enhancing the resilience of the non-bank financial intermediation (NBFI) sector while preserving its benefits. ➤ Enhancing cross-border payments. ➤ Harnessing the benefits of digital innovation while containing its risks. ➤ Addressing financial risks from climate change.

Q.94) Consider the following statements :

1. Superconductors offer infinite conductivity to the flow of electrons at low temperatures.
2. The principle of superconductivity can be used in MRI scans.

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

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2**

EXPLANATION:

A superconductor is a material that achieves superconductivity, a state of matter with no electrical resistance and does not allow magnetic fields to penetrate.

Superconductivity is the property of certain materials to conduct direct current (DC) electricity without energy loss when they are cooled below a critical temperature. Such materials offer infinite conductivity or zero resistance to the flow of electrons when cooled to low temperatures. **So, Statement 1 is correct.**

Superconductors have been at the origin of the emergence of the new generation of MRI coils for the last ten years. They have helped enhance the quality of the images and the comfort of the patients.

The Magnetic field in the MRI is generated by a large superconducting electromagnet in which an electric current flows. The weak resistance of superconductors allows very strong currents to flow with no heating in the material, hence enabling to get very high fields of several Tesla.

Once the current flow in the coil and the magnetic field is established, the only thing to do is close the coil and hence "trap" the current. The current can flow and will never dissipate since there is no resistance. The electric supply that initiated the current can then be unplugged: the current and the induced magnetic field will stay the same as long as the temperature is cold enough. The helium tanks in MRIs must hence be filled regularly in order to compensate for the evaporation of liquid helium. **So, Statement 2 is correct.**

ADDITIONAL INFORMATION:

MAGNETIC RESONANCE IMAGING

- Principle**
- An MRI experiment consists in detecting the precession of the magnetization of the atom nuclei that constitute matter.
 - First, this magnetization has to be lined up in a particular direction thanks to a magnetic field with a strong intensity, B_0 , called the “main field”.
 - Then the magnetization must be rotated thanks to a second magnetic field (B_1) that is alternating and perpendicular to the main field, and that is applied for a short amount of time thanks to an emission antenna.
 - Finally, we detect the signal made by magnetization when it returns to its original position in a precession movement, thanks to a reception antenna.
 - Depending on the nature of the environment of the nucleus, magnetization does not go back to equilibrium at the same speed. This is how we make an MRI map of the body.

SUPERCONDUCTIVITY

- Basics**
- Superconductivity is one of nature’s most intriguing quantum phenomena. It was discovered more than 100 years ago in mercury cooled to the temperature of liquid helium (about -452°F , only a few degrees above absolute zero).
 - Early on, scientists could explain what occurred in superconductivity, but the why and how of superconductivity were a mystery for nearly 50 years.
 - In 1957, three physicists at the University of Illinois used quantum mechanics to explain the microscopic mechanism of superconductivity. They proposed a radically new theory of how negatively charged electrons, which normally repel each other, form into pairs below T_c . These paired electrons are held together by atomic-level vibrations known as phonons, and collectively the pairs can move through the material without resistance. For their discovery, these scientists received the Nobel Prize in Physics in 1972.
 - The lack of electrical resistance in superconducting wires means that they can support very high electrical currents, but above a “critical current”, the electron pairs break up, and superconductivity is destroyed.

**High-
Temperature
Superconducting
Materials
(HTSM)**

- In 1986, scientists discovered a new class of copper-oxide materials that exhibited superconductivity but at much higher temperatures than the metals and metal alloys from earlier in the century.
- These materials are known as high-temperature superconductors. While they still must be cooled, they are superconducting at much warmer temperatures—some of them at temperatures above liquid nitrogen (-321°F).
- This discovery held the promise of revolutionary new technologies. It also suggested that scientists may be able to find materials that are superconducting at relatively high temperatures.
- Since then, many new high-temperature superconducting materials have been discovered using educated guesses combined with trial-and-error experiments, including a class of iron-based materials.
- However, it also became clear that the microscopic theory that describes superconductivity in metals and metal alloys does not apply to most of these new materials, so once again, the mystery of superconductivity is challenging the scientific community.

Q.95) Which of the following statements regarding Public Interest Litigation in India is **not** correct?

- (a) It is a litigation introduced in a court of law, not by the aggrieved party but by the court itself or by any other private party.
- (b) Public interest litigation is not defined in any statute or in any act.
- (c) The cases may arise from both public and private law matters.
- (d) It can be filed directly in the Supreme Court but not in any other courts.**

EXPLANATION:

In Indian law, Public Interest Litigation (PIL) means litigation for the protection of public interest. It is litigation introduced in a court of law, not by the aggrieved party but by the court itself or by any other private party. It is not necessary, for the exercise of the court's jurisdiction, that the person who is the victim of the violation of his or her right should personally approach the court. Public Interest Litigation is the power given to the public by courts through judicial activism.

Such cases may occur when the victim does not have the necessary resources to commence litigation or his freedom to move court has been suppressed or encroached upon. The court can itself take cognizance of the matter and proceed *suomotu*, or cases can commence on the petition of any public-spirited individual. **So, Option (a) is correct.**

Public interest litigation is not defined in any statute or in any act. It has been interpreted by judges to consider the intent of the public at large. **So, Option (b) is correct.**

Although the main and only focus of such litigation is only Public Interest, there are various areas where a Public interest litigation can be filed. For e.g.

- Violation of basic human rights of the poor.
- Content or conduct of government policy.
- Compel municipal authorities to perform a public duty.
- Violation of religious rights or other basic fundamental rights. **So, Option (c) is correct.**

According to the principles of PIL evolved by the Supreme Court, the Court, in the exercise of powers under Articles 32 and 226 of the Constitution, can entertain a petition filed by any interested person in the welfare of the people who are in a disadvantaged position and thus not in a position to knock the doors of the Court. The Court is constitutionally bound to protect the Fundamental Rights of such disadvantaged people and direct the State to fulfill its constitutional promises.

As Article 226 of the Constitution gives power to the High Courts in India to review the laws made by the legislature or orders made by the executive, High Courts can also entertain PILs. **So, Option (d) is not correct.**

ADDITIONAL INFORMATION:

PUBLIC INTEREST LITIGATION

Need for PIL The Judiciary, being the sentinel of constitutional, statutory rights of citizens, has a special role to play in the constitutional scheme. It can review legislation and administrative actions or decisions on the anvil of constitutional law.

For the enforcement of fundamental rights, one has to move the Supreme Court or the High Court's directly by invoking the Writ Jurisdiction of these courts. But the high cost and complicated procedure involved in litigation, however, make equal access to jurisdiction in mere slogan in respect of millions of destitute and underprivileged masses stricken by poverty, illiteracy and ignorance. The Supreme Court of India pioneered Public Interest Litigation (PIL), thereby throwing upon the portals of courts to the common man.

- Guidelines laid by the Supreme Court for Checking Misuse of**
- Each High Court must properly formulate rules for encouraging genuine PIL filed and discourage PIL filed with oblique motives.
 - The Court should prima facie verify the credentials of the petitioner and be satisfied with the correctness of the contents of the PIL before entertaining the PIL.
 - The Court should be fully satisfied that substantial public interest is involved before entertaining the petition.

- PIL**
- The Court should also ensure that there is no personal gain, private motive or oblique motive behind filing PIL.
 - The Court must discourage those who file frivolous PILs by imposing exemplary costs or adopting similar novel methods.

Q.96) Consider the following pairs :

Regions often mentioned in the news	Country
1. Akwaya	- Cameroon
2. Lysychansk	- Ukraine
3. Kherson	- Afghanistan
4. Paktika	- Cambodia

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

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

EXPLANATION:

Akwaya is a town and commune in Cameroon. Cameroon is a Central African country called "Africa in miniature" as it features a variety of geographical regions like mountains, deserts, savanna, rainforest, and coastal plains.

Significant rivers include the Dja, Nyong, and Sanaga. Cameroon's lowest point is the Atlantic Ocean (0 m). **So, Pair 1 is correct.**



Lysychansk is a city in the Sievierodonetsk Raion (district) of the Luhansk Oblast in Ukraine. Ukraine is an Eastern European country and is the largest country entirely within Europe. It is situated both in the Northern and Eastern hemispheres of the earth.

7 European Nations border Ukraine: Belarus in the north; Hungary, Slovakia and Poland in the west; Moldova and Romania in the southwest; and by Russia in the east and northeast. The Black Sea and the Sea of Azov the southbound. The Autonomous Republic of Crimea borders Ukraine to the south. Major Rivers include the Desna, Dnieper, Dniester, Donets and Southern Bug.

So, Pair 2 is correct.



Kherson is a city in southern Ukraine. It lies on the lower Dnieper River's right (west) bank, about 15 miles (25 km) from the river's mouth.

Kherson, named after the ancient settlement of Chersonesus (west of what is now Sevastopol), was founded in 1778 as a fortress to protect the newly acquired Black Sea frontage of Russia, and it became the first Russian naval base and shipyard on the Black Sea. **So, Pair 3 is not correct.**

Paktika Province is located in eastern Afghanistan, on Afghanistan - Pakistan border. Paktika is bordered in the north by Ghazni, Paktia, and Khost provinces, in the east and south by Pakistan, and in the west by Ghazni and Zabul provinces.

The Shinkay Hills runs through the center of Paktika; Toba Kakar Range runs along the border with Pakistan.

The Southern districts are intermittently irrigated and cultivated, and the center and north are used primarily for rangeland. There are natural forests in Ziruk, Nika, Gayan, and Bernal districts. **So, Pair 4 is not correct.**



Q.97) The seventh schedule of the Indian Constitution deals with Union, State and Concurrent lists. Which among the following subjects are listed under the Concurrent list ?

1. Education
2. Forest
3. Industries
4. Weights and measures
5. Administration of justice
6. Burials and burial grounds

7. Electricity

Select the correct answer from the code given below :

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

EXPLANATION:

Article 246 of the Indian constitution deals with the division of powers between the union and the state government. Accordingly, the 7th Schedule of the Indian Constitution that deals with the division of powers notified three kinds of the list: Union List – List I, State List – List II and Concurrent List – List III.

The 42nd amendment to the Indian Constitution in 1976 transferred five subjects from the state list to the concurrent list. These subjects include ‘Education’, ‘Forest’, ‘Weights and Measures’, ‘Protection of Wild Animals and Birds’, and ‘Administration of Justice.’

Accordingly, Education, including technical Education, Medical Education and universities, Forest, Weights and measures except for the establishment of a standard, Administration of justice, constitution and organization of all courts, except the Supreme Court and the high courts, and Electricity, comes under the Concurrent list.

Though subjects like ‘Commercial and industrial monopolies, combines and trusts’ and ‘Trade unions; industrial and labour disputes’ come under the concurrent list, Industries as a subject come substantially under the Union list and State list.

Burials and burial grounds come under the State list. **So, Option (b) is correct.**

ADDITIONAL INFORMATION:

SEVENTH SCHEDULE

- About** ➤ The constitution of India specifies the distribution of powers and responsibilities between the state and central government through the Seventh Schedule, which is the most important part of the constitution that specifies the role and responsibilities of the three lists: Union List, State List and Concurrent List.
- The three lists in brief** ➤ The three lists have been changed since they first came into being; the Union list contained 97 subjects and now is at 100 subjects; the state list contained 66 subjects but is now at 61 subjects; and the concurrent list contained 47 subjects but now has 52 subjects on the concurrent list.
 - Union list of Seventh Schedule
 - The Union List lists 100 subjects in which the Union or Centre government enjoys supreme jurisdiction.
 - Here, the central government can decide on a list of matters of national importance.
 - The Union list consists of subjects of National Importance like defense, foreign affairs, banking, atomic energy, railways, post etc.
 - State list of Seventh Schedule
 - The state list lists 61 subjects that state legislatures enjoy jurisdiction over.
 - Here the state legislature can pass laws and govern the said subjects.
 - The state list specifies jurisdiction over subjects like public order, prisons, public health, production, manufacture, transport, purchase and sale of intoxicating liquors, agricultural Education and research, fisheries, state public services etc.
 - The concurrent list under Seventh Schedule
 - The concurrent list lists 47 subjects over which the Union and State legislatures enjoy jurisdiction.
 - The constitution of India specifies subjects like criminal law, criminal procedure,

preventive detention, forests, protection of wild animals and birds, trade unions, industrial and labor disputes, population control and family planning, etcetera to the concurrent list.

➤ Residual Powers

- Residuary powers refer to the power of jurisdiction upon subjects that are not mentioned in the state or concurrent list.
- The union government enjoys exclusive jurisdiction over such subjects.
- Article 248 of the constitution states, "The Union Parliament has exclusive power to make any law concerning any matter not enumerated in the Concurrent List or the State List."

Q.98) Which of the following rivers does not have its origin in the Aravalli ranges ?

- (a) Banas
- (b) Betwa**
- (c) Sakhi
- (d) Sabarmati

EXPLANATION:

The Aravalli Hills are highly eroded hills that lie on the western and northwestern margins of the Peninsular plateau. They extend from Gujarat to Delhi in a southwest-northeast direction. It gives rise to several important rivers, including the Banas, Luni, Sakhi, and Sabarmati.

The river Betwa is present in Central and Northern India, a tributary of the Yamuna. It has its origin in the Vindhyan range just north of Hoshangabad, Madhya Pradesh.

So, Option (b) is correct.



ADDITIONAL INFORMATION:

ARAVALLI MOUNTAIN RANGE

- About**
- The Aravalli mountain range is one of the oldest mountain ranges in the world.
 - It is the oldest fold mountain in India, where the northern end of the mountain range continues as isolated hills and rocky ridges into Haryana state, ending in Delhi, the last leg of the Aravalli Range.
 - The Aravallimountain dates back to a pre-Indian subcontinental collision with the

mainland Eurasian Plate.

- The highest point is Mount Abu, Gurushikhar, which is 1722 m high. However, the main range comprises low hills that project out from the desert sand.
- Spread over an area of 692 km, the Aravallis cover the states of Gujarat, Rajasthan, Delhi and Haryana.
- The Aravalli mountain chain is a water divide between the Indus and Ganga river systems.
- The Indian desert lies towards the western margins of the Aravali Hills.
- The Aravalli Range is rich in natural resources (including minerals) and serves as a check to the growth of the western desert.



- Q.99) The term “Conversion Therapy”, which has been in the news in recent times, is related to :
- (a) Efforts to change the religious identity of the vulnerable communities
 - (b) Attempts to change the sexual orientation of the people**
 - (c) Tinkering with the genetic identity of the people
 - (d) Brainstorming youth toward ideological motives

EXPLANATION:

Recently, the National Medical Commission (NMC) declared conversion therapy “professional misconduct” and empowered State Medical Councils to take disciplinary action if the guideline is breached.

“Reparative” or “conversion” therapy is a dangerous practice that targets LGBTQ+ youth. It seeks to change their sexual or gender identities through psychiatric treatment, drugs, exorcism and even

violence, with the aim being to make the individual a heterosexual.

“Conversion therapy,” is a range of dangerous and discredited practices falsely claiming to change a person’s sexual orientation or gender identity, or expression. Such practices have been rejected by every mainstream medical and mental health organization for decades.

Still, due to continuing discrimination and societal bias against LGBTQ people, some practitioners continue to conduct conversion therapy. Minors are especially vulnerable, and conversion therapy can lead to depression, anxiety, drug use, homelessness, and suicide. **So, Option (b) is correct.**

ADDITIONAL INFORMATION:

PRIVATE MEMBER BILL FOR LGBTQIA+ COMMUNITY

- Recently in News**
- Recently, a private member bill was introduced in the Lok Sabha for the benefit of LGBTQ community and amending of Special marriages Act, 1954.
 - Tamil Nadu State Medical Council (TNMC) has also recently notified the "conversion therapy" of LGBTQIA+ persons as a "professional misconduct" and warned of disciplinary action against medicos who undertake any attempt or intervention to "change the sexual orientation/gender identity of a person."
- About**
- A private member Bill is a draft legislation introduced by a parliamentarian who is not a minister.
 - Although homosexuality was decriminalized in the country in 2018 when Supreme Court struck down section 377 of the Indian Penal Code (IPC), LGBTQIA individuals can still not marry and have families. Community members can also not exercise rights like succession, maintenance, and pensions, usually accorded to heterosexual couples. LGBTQIA individuals still face persecution, discrimination and social stigma within society.
 - The Bill seeks to amend the Special Marriage Act to recognize marriages between two males of at least 21 years of age or between two females of at least 18 years of age as legal. It also proposes to replace the words “husband” and “wife” with “spouse.”
 - The Bill includes granting rights to marriage, adoption, guardianship, surrogacy and the prohibition against workplace discrimination and housing.
 - The Bill invokes the 2011 United Nations Human Rights Council resolution recognizing LGBT rights, urging all countries to enact laws protecting the community's basic rights.
- Provisions in the Constitution**
- Article 14 of the Indian Constitution ensures equality before the law and states, The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India.
 - Article 21 of the Indian Constitution deals with the protection of life and personal liberty, and says, No person shall be deprived of his life or personal liberty except according to procedure established by law.

Q.100) World Social Protection Report is released by:

- (a) World Bank
- (b) United Nations Development Programme
- (c) Organization for Economic Cooperation and Development
- (d) International Labour Organization**

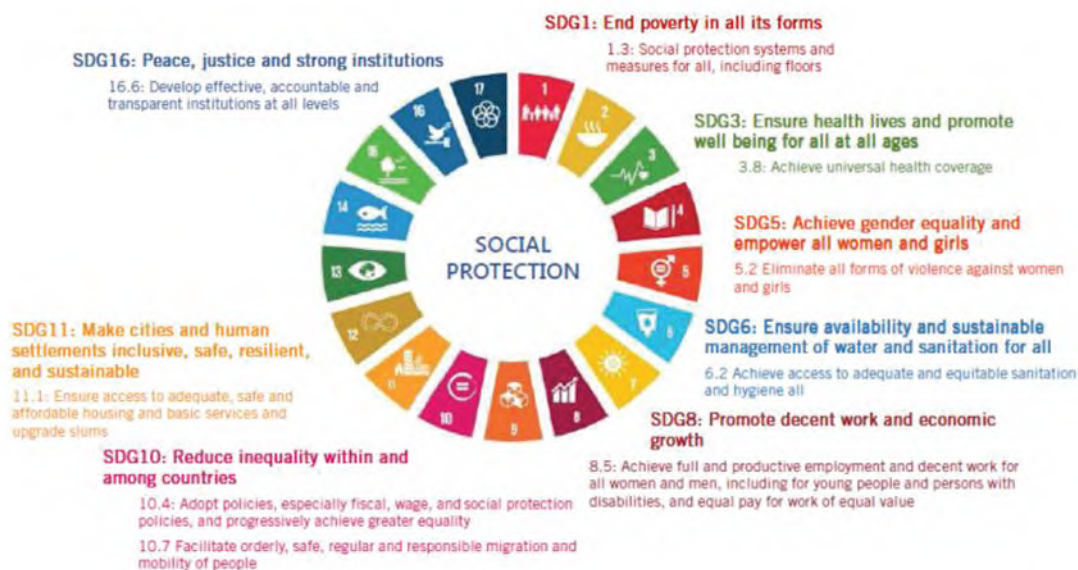
EXPLANATION:

World Social Protection Report 2020-2022 was published by International Labour Organization. This report was released with the theme of “Social protection at the crossroads – in pursuit of a better future”.

Social protection includes access to health care and income security measures related especially to

old age, unemployment, sickness, disability, work injury, maternity or the loss of the main breadwinner in a family, as well as extra support for families with children.

This ILO flagship report provides a global overview of recent developments in social protection systems, including social protection floors, and covers the impact of the COVID-19 pandemic. According to the report, only 46.9% of the global population benefitted from at least one such protection. That low rate came even as access to healthcare, sickness and unemployment benefits have more than ever proved their relevance during the pandemic. **So, Option (d) is correct.**



ADDITIONAL INFORMATION:

SOCIAL SECURITY IN INDIA

Definition of Social Security

According to the definition given by International Labour Organization, Social Security is the protection that society provides to individuals and households to ensure access to health care and to guarantee income security, particularly in cases of old age, unemployment, sickness, invalidity, work injury, maternity or loss of a breadwinner.

Social Protection Schemes in India

- Pradhan Mantri Shram Yogi Maan-Dhan Yojana (PM-SYM) benefits that after attaining the age of 60 yrs, beneficiaries are entitled to receive a minimum monthly assured pension of Rs.3000/-A spouse is eligible for a 50% monthly pension on the beneficiary's death. If both husband and wife join the scheme, they are jointly eligible for Rs. 6000/- monthly pension.
- National Pension Scheme for Traders and The Self-employed Persons (NPS) in which beneficiaries are entitled to receive a minimum monthly assured pension of Rs.3000/- after attaining the age of 60 years.
- Pradhan Mantri Suraksha Bima Yojana (PMSBY) deals with the risk covered under the scheme is Rs. 2 lakhs for accidental death and full disability and Rs. 1 lakh for partial disability, and a Premium of Rs.20 per year.
- Public Distribution System benefits 35 kg of rice or wheat every month. A household above the poverty line is entitled to 15 kg of food grain every month. It is being implemented as ONORC to enable migrant workers to receive food grains wherever they work.
- Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) is a health coverage of Rs. 5 lakhs per family per year for secondary and tertiary care hospitalization free of cost.

- National Safai Karamcharis Finance and Development Corporation scheme provides financial assistance to the Safai Karamcharis, Manual Scavengers and their dependants through SCAs or RRBs or Nationalized Banks for any viable income-generating schemes, including sanitation-related activities and education in India and Abroad.