CHAPTER-11: ELECTRICITY AND MAGNETISM

A. Answer the following questions:

1. The flow of electrons through a conductor is known as electric current. Electrochemical cells, solar cells, electric generator or dynamos are general sources of electric current.

2. (i) **Voltaic cell**: This was invented by Alessandro Volta, an Italian scientist. He found that when two strips of different metals are dipped in an acid solution, an electric current flows through them. The acid used in such a cell is called an electrolyte and the two metal strips dipped in it are called electrodes. In this cell, the electrolyte is sulphuric acid and the electrodes are strips of copper and zinc. The chemical reaction between the acid and metal strips causes electrons to flow from the zinc strip to the copper strip through the wire connecting the two. The disadvantage of the voltaic cell is that the current flow through the wire is not smooth and steady.

   (ii) **Daniell Cell**: This is an improved version of the voltaic cell and was developed by J.F. Daniell in the year 1839. It consists of a non-metallic container. A porous plate divides it into two halves. One compartment contains zinc sulphate solution and the other contains copper sulphate solution which act as electrolytes. A zinc plate acts as an anode (−) and a copper plate acts as a cathode (+). A current flows when these two electrodes are connected by a wire. This gives a steady flow of current compared to a voltaic cell.

   (iii) **Dry Cell**: Both voltaic and Daniell cell use liquid as electrolyte, which is inconvenient and difficult to use. In 1866, Leclanche, a French scientist invented a cell called a **dry cell**. The dry cell has a cylindrical zinc container which forms the negative electrode. A carbon rod with brass cap acts as the positive electrode. It is surrounded by a black powder, a mixture of manganese dioxide (MnO2) and graphite (C). This black powder is contained in a thin bag of cloth. The space between the zinc casing and bag is filled with a thick paste of ammonium chloride which...
forms the electrolyte. A layer of pitch seals the top of the cell and prevents the leakage of the contents of the cell.

Electrons flow from zinc to the carbon rod and generate an electric current when the circuit is complete. A dry cell gives a voltage of 1.5 volts.

The advantages of a dry cell are:
(i) It is compact
(ii) It is light or easy to carry
(iii) It is convenient to use.

The disadvantages are:
(i) It produces only small currents for a relatively short period.
(ii) It cannot be used once it is run down.

3. There is a complete pathway for the flow of electric current. This pathway is known as electric circuit. In the following figures, we find the bulb lights up when the electric circuit is complete or is closed; whereas it does not light up when the electric circuit is not complete or is opened.

There are three main parts to an electric circuit:
(i) The first is a source of electric energy, such as a battery or generator
(ii) The second is an output device, such as a motor or bulb.
(iii) The third is a connection between the source and the output device, such as a wire or cable.

4. The accurate measure of the current flowing through a circuit can be done with the help of an instrument called Ammeter. The S.I unit of electric current is ampere (A).

5. Properties of a Magnet
(i) A magnet attracts iron: When a magnet is brought near iron-filings, the filings stick to the magnet. The amount of filings is maximum at ends and minimum in the middle; being zero at mid-point. The regions at the ends of the magnet, where attraction is maximum, are called the poles.

(ii) A freely suspended magnet always stays along North-South direction: This is because there is a large magnetic field around the earth. This magnetic field acts on a suspended magnet and the magnet comes to rest along the direction of the magnetic field at the place. If we take a bar magnet suspended it freely, we will notice that it comes to rest in the north-south direction. Similarly the needle of a magnetic compass always points in the north-south direction.

(iii) Like poles repel and unlike poles attract: When north poles (or south poles) of two freely suspended magnets are brought near, they
repel each other but if north pole of one magnet is brought near the south pole of the other, they attract each other.

(iv) **Magnetic poles exist in pairs of NS of SN**: This means if one of the poles of a magnet is N, the other has to be S or if one pole is S, the other has to be N.

6. See answer of Q 5 point (iii).

7. **Temporary and permanent magnets**: There are two basic types of magnets; Permanent and Temporary. A temporary magnet has strong magnetic properties only as long as it is under the influence of a permanent magnet. Every object lifted or moved by a magnet, becomes a temporary magnet. It ordinarily loses its magnetisms when the permanent magnet is removed. A permanent magnet retains its magnetic properties for a long period of time under ordinary circumstance. Most permanent magnets are mainly made of ALNICO, an alloy of Aluminium, Nickle and Cobalt.

8. **Magnetic compass**: A magnetic compass is a simple device consisting of a magnetic needle which is free to rotate on a pivot at the centre of a round box. It is used by sailors and navigators to figure out the four directions. In the compass, the needle rests in the north-south direction. As the magnetic poles of the earth are not at the same position as the geographical poles, the magnet in the compass really points towards the magnetic north-south direction. While navigating with the help of a compass needle, this fact is taken into consideration to find the correct geographical direction.

9. **Earth Is A Huge Magnet itself**: The earth's magnetic field is similar to that of a giant bar magnet placed at its centre. Very deep inside the earth there is hot molten metal (mainly iron core). The scientists believe that the motion of electric charges (geothermal currents) produce the electro-magnetic field. Although the earth is round yet it has magnetic poles at the two ends just like a bar magnet has. It is due to the influence of earth's magnetic field that a bar magnet align itself in the north-south direction. The points where the magnetic axis of the fictitious bar magnet cut the earth's surface are called magnetic poles. The line joining the north and the south pole of this imaginary magnet makes an angle about 15° with earth's axis of rotation. The north pole of this magnet is towards the geographical south pole and the south pole of this magnet is towards the geographical north pole.

10. **Electromagnets**: Electromagnets are temporary magnets produced by
passing electricity through an insulating copper wire wound on a soft iron bar. Since magnetism is retained only as long as the current flows through the wire, this magnet is temporary. The strength of an electromagnet depends on the amount of current flowing through its coils, length of the wire and material used to make electromagnets.

**Making the field stronger**

A stronger electromagnet can attract more magnetic material. One way to make an electromagnet stronger is to pass a larger current through the coil. Another way to make an electromagnet stronger is to increase the number of coils around the core. The substance used to make the core can also effect the strength of the field. The magnets have the same number of coils and are carrying the same current. Only the core materials are different. All three of these methods are used to make different kinds of electromagnets for use in medicine and industry.

11. **Uses of electromagnets**

   - Electromagnets are used to separate magnetic substances from non-magnetic substances.
   - They are also used to remove ‘foreign bodies’ like iron filing from a patient’s body particularly from the eye.
   - Some modern trams and trains use electromagnets. The Maglev train at Birmingham airport rides just above the surface of the track. It is held there by electromagnets.
   - Electromagnets are also used in electric bells, loudspeakers, television, telegraphs, telephones, audio and video tape recorders and players, etc.

12. **Electric bell**: A door bell is an electric bell that works on the principle of electromagnetism (magnetic effect produced by electric current). Pushing the button of an electric door bell completes an electric circuit, causing the door bell to ring. The circuit includes a metal movable part called an armature. At one end of the armature is a clapper that produces a ringing sound when it hits the bell. Also attached to the armature is a spring that presses against a screw. The armature is made of iron or another metal that can be magnetized. An electromagnet, magnetize the armature, attracting the armature toward the electromagnet and the bell. When the armature moves towards the bell, the spring moves away from the screw and breaks the circuit. Because the circuit is broken, the electromagnet no longer attracts the
metal armature. Thus, after striking the bell, the armature moves away from the electromagnet. When the spring again makes contact with the screw, the circuit is completed again. Then the armature again moves towards the electromagnet, causing the clapper to hit the bell. The repeated completing and breaking of the circuit causes the doorbell to make its vibrating ring.

13. **Electromagnetic Induction**: Induction is a phenomenon in physics that occurs when a changing magnetic field causes an electric current to be produced in a wire. This phenomenon is referred to as *electromagnetic induction*.

Electromagnetic induction was first discovered by an English scientist, Michael Faraday. Faraday placed some wire between the poles of a magnet. Then he joined the ends of the wire through an instrument that could detect an electric current. When the wire was moved through the magnetic field, a direct current flowed through the wire.

Faraday also discovered a similar effect with alternating current. He placed two coils of wire near each other. Then he passed an alternating current through one of the coils. An alternating current reversed its flow at short intervals. Because the current was changing, it set up a changing magnetic field around itself. This field changed with the current. Faraday found that a similar current was induced in the second coil. It was induced by the changing magnetic field.

The phenomenon of electromagnetic induction is used for production of current in cycle dynamos. In cycle dynamos, the coil is moved in magnetic field through the mechanical motion of the wheel of the cycle.

14. **Dynamo (Electric generator)**: The principle on which electric generator or dynamo works is the ‘electromagnetic induction’. A dynamo is a machine designed to change mechanical energy into electrical energy. It is also called an electrical generator. The simplest dynamo consists of a coil of wire rotating between the poles of a magnet. The magnetic field causes an electric current to flow through the wire.

When the coil is rotated in the magnetic field a current is induced in it. The current generated is supplied by wires connected to the carbon brushes.

In large generators, the coil is connected to a turbine which is rotated by the energy of falling water as in a hydel power station, or by the heat energy of steam as in thermal power station.

**B. Fill in the blanks**:  
1. Positive, Negative  
2. electrolyte, electrodes  
3. insulator  
4. magnetite (Fe₃O₄)  
5. temporary  
6. electromagnetism  
7. chemical, electrical  
8. secondary
C. **Differentiate between:**

1. **Differences between primary and secondary cell:**

<table>
<thead>
<tr>
<th>Primary cells</th>
<th>Secondary cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Primary cells are those in which chemical energy is converted into electrical energy through an irreversible chemical reaction.</td>
<td>(i) Secondary cells are those in which chemical energy is converted into electrical energy through a reversible chemical reaction.</td>
</tr>
<tr>
<td>(ii) These cells cannot be recharged.</td>
<td>(ii) These cells can be recharged.</td>
</tr>
<tr>
<td>(iii) Example: Simple voltaic cell, dainel cell, Lech lanch cell.</td>
<td>(iii) Examples: Lead acid cell, Edison's alkali cell.</td>
</tr>
</tbody>
</table>

2. **Difference between Galvanometer and Voltmeter:**
   Galvanometer is used to detect the presence of electric current of low magnitudes. While, Voltmeter is used to measure the potential difference (or voltage) between two points in an electric circuit in volts.

3. **Difference between conductors and insulators:**
   The materials that allow electric current to pass through them are called conductors. All metals are good conductors of electricity. Some non-metals like graphite are also good conductors of electricity. The electric current is conducted through human body also. Even water is a good conductor of electricity when it is impure. Pure water (distilled water), is not a good conductor. On the other hand, those materials which do not allow electric current to pass through them, are called insulators. Materials such as plastics, rubber, wood, glass, polythene, PVC etc. are insulators. You must have observed electrician using rubber gloves while working with electricity because an insulator protects from electric shocks.

4. **Difference between magnetic and non-magnetic substances:**
   Substances which are attracted by a magnet are called magnetic substances. Examples include iron, cobalt, nickel and their alloys. Substances which are not attracted by a magnet are called *non magnetic substances*. Examples of such substances are aluminum, copper, brass, stainless steel, wood, plastic, etc.

D. **Tick (✓) the correct options:**
   1. b  2. a  3. c.  4. b  5. a  6. a  7. b

**CHAPTER - 12 : SOURCES OF ENERGY**

A. **Answer the following questions:**

1. Energy is the ability to exert a force over a distance or to do work. Sun is the major source of energy on the earth. Beside, fuels, water, wind and biomass are also sources of energy.

2. **Renewable sources of energy:** The sources of energy which are being produced in nature continuously and which can be used again and again are called renewable sources of energy. Sun, wind, water, tides and heat of the earth are renewable sources of energy.
Non renewable sources of energy: The sources of energy which are exhaustible, i.e., which can be finished and have been formed in nature long ago are known as non-renewable sources of energy. Coal, petroleum and natural gas are some examples of non-renewable sources of energy.

3. Solar Energy from the sun is called solar energy. Solar energy can be harnessed in three ways:
   (i) utilising the heat from sunlight.
   (ii) converting solar energy directly into electrical energy, and
   (iii) using photosynthetic and biological processes.
   (i) Utilising Heat from sunlight: Solar cookers, solar ovens, solar water heaters, solar furnaces and solar dryers are used for different purposes like cooking, warming water, drying etc. These devices use heat from sunlight to work. In these devices reflectors are used for focusing sunlight.

(ii) Conversion of Solar Energy Directly into Electrical Energy: The conversion of solar energy into electricity can be achieved via two routes: (A) solar energy is used to boil water which can then be used to generate electricity (solar thermal power generation); and (B) direct conversion of solar energy into electricity using solar cells.

(iii) Biological Conversion of Solar Energy: Photosynthesis in plants is a biological process by which they convert solar energy into sugars and starches which are energy-rich compounds. Fast growing trees having high photosynthetic efficiency can therefore, be harvested and burned to raise steam and generate electricity as in a thermal power station. Such an ‘energy plantation’ would be a renewable resource and economical means of harnessing solar energy.

4. Limitations of solar energy:
   (i) Solar energy reaches the Earth in a very diffused form.
   (ii) Solar energy is not available uniformly all the time and at all the places.
   (iii) Solar energy is not available at night and on cloudy days.
   (iv) Effect of solar energy is reduced during winter.
   (v) Solar energy cannot produce very high temperature and thus remains as less useful source of energy for the big industries.

5. Harnessing Wind Energy
   Windmills
   It is a simple machine that works with the energy of the wind. The windmills run when the wind blows. With this wind power the windmills are used to turn grindstones and pump water. The windmills are used to produce electricity since early 1900's. The minimum wind velocity required for a functional windmill is about 15 km/h.
Wind Power
Turbine is a machine for converting the kinetic energy of the fluid (flowing water or gas) into mechanical energy. Any turbine can turn a generator. The wind can turn a turbine. Energy comes from the sun as heat energy. This becomes kinetic energy (movement) in the wind. The wind turns a turbine of generator, which generates electricity.

6. The electricity produced using power of running water is called hydroelectric energy. Hydel energy (energy of running water) can herversed using generators to produce electricity. Running water is an easily available source of energy. It can be used to turn turbine of generator to produce electricity and is the basis of the hydroelectric plant. Water is stored in a reservoir behind a dam. When water flows from a height, it turns big turbines to generate electricity.

7. Nuclear energy is the energy stored in the nuclear of certain heavy elements, such as uranium and plutonium. There are two ways of producing nuclear energy it and both ways release enormous amounts of energy. One way is to split the nucleus of an atom. The process is called nuclear fission. The other way is to join, or fuse the nuclei of two atoms. The process called nuclear fusion.

8. Formation of Coal: Coal is a mineral of plant origin. It is formed by the decomposition of the remains of trees, bushes and other forms of plant life which were buried deep beneath the earth millions of years ago. This slow process in which vegetable matter is converted into coal is called carbonization. This process is very gradual and slow and may take millions of years to complete. Because this process is very slow, several intermediate products are also formed during carbonization; they are peat, lignite, bituminous and anthracite. Anthracite is formed in the final stage of carbonization and hence has a high carbon content.

Formation of Petroleum
It is believed that petroleum is formed from the remains of microorganisms (very small organisms) and tiny plants living in the sea. Millions of years ago, when these organisms died, their remains sank to the bottom of the sea and got covered with sand and clay. Due to the chemical effect of heat, pressure and a catalytic action caused by bacteria, these remains decomposed to form petroleum which got trapped between the layers of impervious (non-porous) rocks.

9. Solid Fuels: Solid fuels include wood, coal, coke, charcoal and peat. Wood has been used as a fuel for thousands of years. It was the first fuel to be used by people. Few countries rely on it as a fuel today. Let us discuss the different types and usefulness of solid fuels.

Wood: Firewood is obtained from the forests and is primarily used for heating and cooking.
Coal : Coal is made up of complex compounds of carbon and mineral matter of earth’s crust. It is used as a fuel in its various forms.

Coke : When coal is heated strongly in the absence of air then a solid grey substance having pores is obtained which is called coke. Coke contains 87 to 89% carbon.

Uses :
(i) Most of the coke is used for industrial purposes.
(ii) Some of the coke is used to melt iron ore in a process called smelting.
(iii) A small amount of coke is used as a fuel.

Charcoal
Charcoal is a black, brittle substance that is porous, or full of tiny holes. Charcoal is manufactured by heating plants rich in carbon or by heating animal remains, such as bones, in ovens that contain little or no air. As the substance is heated, most of the hydrogen, nitrogen and oxygen in the substance escape. the end product is charcoal.

Charcoal has many uses :
(i) It makes an excellent fuel.
(ii) Artists use wood charcoal for drawing.

10. Impact of Energy Consumption on Environment
The development of technology and the consequent rise in energy consumption has affected the environment in the following ways:
Burning of fossil fuels has resulted in the release of pollutants like carbon monoxide, carbon dioxide, sulphur dioxide, oxides of nitrogen, lead, arsenic, asbestos, radioactive materials and dust.

✦ Oxides of sulphur and nitrogen result in acid rain.
✦ The increased amount of carbon dioxide in the atmosphere is leading to global warming.
✦ Discharge from industries, power plants, coal mines and oil wells pollute water.
✦ Use of CFC (chlorofluorocarbons) can affect the ozone layer which protects us from ultraviolet radiation.

B. Write short notes on the following :
1. Solar cells : A solar cell is a device which converts sunlight directly into electricity. A combination of a large number of solar cells is called a solar cell panel. Solar cells are used in wristwatches and calculators. Solar cell panels are used for producing electricity for use in space stations and artificial satellites. They are very useful for street lighting in rural areas, running water pumps for agriculture, providing electricity to light houses and offshore drilling. Inspite of their high cost, the use of solar cell panels is increasing.

2. Windmills : Windmills is a simple machine that works with the energy of the wind. The windmills run when the wind blows. With this wind power
the windmills are used to turn grindstones and pump water. The windmills are used to produce electricity since early 1900’s. The minimum wind velocity required for the functional wind mill is about 15 km/h.

3. **Tidal Energy**: The alternate rise and fall in the water level of oceans and seas is known as tides. These are caused due to the gravitational pull of the moon on the earth water. This rise and fall can be harnessed to generate power. At places where water rises by 3–4 metres during high tide, a reservoir is built and water is collected in it. This water is then allowed to fall over a turbine connected to a generator. Thus, electricity is produced, utilising the potential energy of stored water. But this is possible only in areas where the difference between the high tide and low tide is substantial.

4. **Energy from biogas**: Biogas is the name given to methane gas produced by organic matter. Plants, organic wastes, manure, and other forms of biomass can be used as sources of methane. In the absence of air, digestion of these organic materials by anaerobic bacteria produces biogas which is about 60 to 65% methane. The biogas plant is designed in such a way that the raw materials do not come in contact with oxygen. In the absence of oxygen, the animal and plant material decompose to give methane, carbon dioxide, hydrogen and hydrogen sulphide. This mixture of gases is known as biogas. Biogas is a good fuel for cooking. It contain upto 75% methane. Biogas is supplied to consumers through pipes which can be used for street lighting and for cooking food. The residue that left behind, after the removal of biogas is used as manure for plants.

5. **Biomass**: The organic matters that can be converted into source of energy are known as biomass. Dried sea-weed, dried animal dung can also be used as a source of energy. Biomass is an important fuel used for cooking and heating. In Indian villages, cow-dung cakes are used as a fuel for cooking and heating purposes.

There is an energy in biomass because the plants and animals take energy from the Sun as they live and grow. A gas called methane is produced naturally when biomass decays. There are some plants such as sugarcane, wheat and rice which can be fermented by using yeast and then boiled to produce a high energy liquid called alcohol. Like other liquid fuels alcohol can be burnt as a fuel too

6. **Extraction of Petroleum**: Petroleum is obtained by drilling petroleum wells by the heavy and sharp cutting tools. Crude petroleum must be refined before it is used as a fuel or for other purposes.

The basic step in the refining process is distillation. Distillation separates crude oil into a variety of groups by boiling them until they vapourise. The vapours are allowed to cool at various temperatures in a huge tower. At each temperature a number of hydrocarbons become liquid and separate out. They are called fractions.
Hence this process is known as fractional distillation. Some fractions are used as fuels including petrol and diesel. Other fractions go into further processing into valuable chemical raw materials called petrochemicals.

7. **Liquid fuels**: Fuels which are used in liquid form are called liquid fuels. Petroleum is one of the liquid fossil fuels which has almost become indispensable because of its varied uses in our day-to-day life. Thousands of products are derived directly or indirectly from crude oil. All over the world its importance is so much that it is regarded black gold. Some of the petroleum derivatives are petrol, diesel, kerosene, etc.

8. **Per Capita Consumption of Energy in India**: India is the second most populous nation in the world. Seventy per cent of its population still lives in rural areas. Meeting their energy requirements in a sustainable manner continues to be a major challenge for the country. Almost 75% of the total rural energy consumption is in the domestic sector. The main fuels used for lighting in rural households are kerosene and electricity. Irrigation is mainly through electrical and diesel pumps, while rural industries and the transport sector rely primarily on animal power and to some extent on commercial sources of energy like diesel and electricity. For meeting their cooking energy requirements, villagers depend predominantly on biomass fuels like wood, animal dung and agricultural residue, often burnt in not so efficient traditional stoves (*chulhas*).

This has serious implications on the environment. These fuelwood requirements have contributed to the degradation of forests. The problem becomes more complex because of the inability of people to shift to commercial fuels like electricity, LPG and kerosene because of low purchasing power and limited availability. Efforts are being made both by governmental and non-governmental organisations for rural electrification and promoting renewable energy technologies like biogas, improved stoves (*chulhas*) and solar cookers.

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**C. Fill in the blanks:**
1. grindstones 2. kinetic 3. gravitational
4. methane 5. anaerobic 6. biomass
7. uranium, plutonium 8. neutrons 9. Lignite
10. Anthracite

**D. Write ‘T’ for true and ‘F’ for false statements:**

**E. Tick (√) the correct option:**
1. d 2. d 3. d 4. d 5. c

**F. Define the following terms:**
1. **Energy**: Energy is the ability to exert a force over a distance, or to do work.
2. **Solar cells**: A solar cell is a device which converts sunlight directly into electricity.
3. **Wind energy**: The energy possessed by moving air is called wind energy.
4. **Windmill**: It is a simple machine that works with the energy of the wind. The windmill runs when energy the wind blows.

5. **Hydroelectric Energy**: Electricity produced by the energy of running water is called hydroelectric energy.

6. **Biogas**: Biogas is the name given to methane gas produced by organic matter.

7. **Biomass**: The organic matters that can be converted into source of energy are known as biomass.

8. **Nuclear Fission**: When the nucleus of a heavy atom (for example uranium) splits and forms smaller nucleus a large quantity of energy is released. This process is called nuclear fission.

9. **Nuclear Fusion**: In nuclear fusion, small nuclei fuse to form larger nuclei. A large amount of energy is released in this process.

10. **Fossil fuels**: Fossil fuels are the sources of energy that were formed millions of years ago from the remains of animals, plants and microorganisms.

**CHAPTER-13 : SOME COMMON DISEASES**

A. **Answer the following questions**:

1. Disease is condition of a living being that prevents it from functioning in a normal way. When a person does not seem to be working normally and feels discomfort, he/she may have a disease.

2. A person is said to be suffering from diseases for the following reasons.
   (i) Infection by micro-organisms for example cholera, typhoid, etc.
   (ii) Malfunctioning of body organs for example, heart diseases caused due to the malfunctioning of heart, diabetes due to insufficient insulin secretion.
   (iii) Addiction to drugs and alcohol for example cirrhosis of liver.
   (iv) Allergy to the dust or pollen grains for example asthma.
   (v) Deficiency of adequate nutrients in the body.

3. **Communicable (infectious) diseases**: These are caused by the attack of micro-organisms (pathogens) such as bacteria, viruses, fungi or protozoans. The causal organism of the disease can be transmitted from one person to another by means of air, water, food, physical contact and insects (vectors). Hence, these are called communicable diseases that are communicated from a diseased person to a healthy person.

   Communicable diseases caused by different micro-organisms are given below:
   (1) **Bacteria**: Cholera, tuberculosis, diarrhoea, typhoid, diphtheria, tetanus, etc.
   (2) **Viruses**: Polio, rabies, measles, smallpox, mumps, etc.
   (3) **Protozoa**: Malaria, amoebiasis, kala-azar, sleeping sickness, etc.
   (4) **Helminths**: Taeniasis, asciasis, filariasis, etc.
   (5) **Fungi**: Ringworm, athlete's foot, etc.
NON-COMMUNICABLE (NON-INFECTIOUS) DISEASES
The diseases which do not spread from an infected person to a healthy person are known as non-communicable or non-infectious diseases such as diabetes, arthritis, heart disease, cancer, etc. Many non-communicable diseases are due to nutritional deficiency.

Non-Communicable diseases can be categorised into five types:

1. **Deficiency diseases**: Beri-Beri, Scurvy, Night blindness, Goitre, etc.
2. **Allergic diseases**: Asthma, Bronchitis, Eczema, etc.
3. **Degenerative diseases**: Heart attack, Diabetes, Arthritis, etc.
4. **Social diseases**: Drug addiction, alcoholism, etc.
5. **Inherited diseases**: Phenylketonuria, albinism, etc.

4. **Transmission of Communicable Diseases**: The disease causing germs are transmitted from patients to the healthy persons by different ways. Some of these are mentioned below:

   - **Direct contact**: When a person uses personal belongings of the patient such as handkerchief, utensils, clothes etc., the germs get transmitted from the patient to the healthy person. Conjunctivitis and skin diseases are some such diseases that spread through direct contact.

   - **Droplet infection**: The diseases are spread through the saliva of the patient while he coughs or sneezes into the air. The germs are transmitted to the healthy person when infected saliva enters from the patient to the healthy person. Diseases such as whooping cough, and tuberculosis spread this way.

   - **Blood**: Transfusion of infected blood or use of infected needle of the syringe can transmit germs. Disease such as AIDS is transmitted this way. A rabies dog can transmit rabies germ to the person as it bites through blood.

   - **Infected food and water**: The diseases such as gastroenteritis are transmitted through infected food and water.

   - **Through carriers**: The germs of diseases such as malaria and dengue are spread through mosquitoes bites. These mosquitoes therefore, are said to be carriers of diseases.

We will not study the symptoms and preventive measures of some diseases caused by micro-organisms.

5. There are a number of barriers in our body that can effectively deal with and ward off the harmful agents that produce diseases.

Our skin is the first major barrier which prevents the entry of microbes into our body. Similarly, the organ systems are lined internally with a protective mucous membrane which guards them from microbial attack.

The various secretions of the body also prevent microbial infections. For example, Our nose has tiny hair and mucus glands which prevent the entry of dust and microbes into the respiratory tract. Tears produce when a
foreign body enters the eye. They serve to flush it out. Excessive nasal secretion when you catch a cold is a well-known example of the body's defence mechanism.

The stomach produces hydrochloric acid (HCl) which can kill harmful microbes that happen to reach it. The blood contains certain soldiers in the form of white blood cells (WBCs) which surround and engulf the microbes which enter the blood stream. Thus, the human body has a number of defence mechanisms to deal with pathogenic microbes.

6. The resistance created in our body to fight infection is called immunity. It can be studied in the following two ways.

1. **Natural immunity**: When a child is immune to a particular disease or microbe from birth, he or she is said to possess natural immunity.

2. **Acquired immunity**: When a person becomes immune to a certain disease either by virtue of an earlier attack by the microbe or through vaccination, he or she is said to possess acquired immunity. Immunity can also be acquired against certain diseases by artificial means like vaccination.

Note: To find answer for question 7, 8, 9 and 10 refer to chapter 5.

B. **Fill in the blanks**:


C. **Match the following**:


D. **Write T for true and F for false statements**:


E. **Tick (✓) the correct option among the following**:

1. (a) 2. (a) 3. (a) 4. (a) 5. (b) 6. (c) 7. (c) 8. (c)

14. **FOOD PRODUCTION AND MANAGEMENT**

A. **Answer the following questions**:

1. The word agriculture is derived from the Latin word ‘ager’ meaning ‘field’ and culture meaning ‘cultivate’. The process of growing and looking after crop plants is called agriculture.

2. Crop plantation involves the following:

   ♦ Soil Preparation ➕ Selection of Seeds
   ♦ Sowing of Seeds ➕ Adding Manure or Fertilizer
   ♦ Irrigation ➕ Weeding
   ♦ Crop Protection ➕ Harvesting
   ♦ Threshing

3. After the preparation of the soil, seeds are sown. When the sowing of seeds is done the following precautions must be taken:

   (i) The seeds should be high yielding varieties, healthy and disease-
resistant.

(ii) The seeds should be sown at the right depth. If sown deep, then the seeds will not get sufficient oxygen for respiration and their shoots may not be able to come out from the greater depth. If seeds are scattered on the surface of the soil, then they will be eaten by birds.

(iii) The soil should have sufficient moisture, otherwise seeds will not germinate properly.

(iv) There should be proper spacing between the seeds. If the spacing is too little, then the seedlings will not get enough nutrients, sunlight and space to grow. And if the spacing is too large, then the production becomes low and a large amount of field space is wasted.

4. The two methods of sowing seeds are as follows.

**Sowing of seeds by hand**

The process of sowing seeds by hand is called broadcasting. In this method, the seeds are scattered in the field by the farmer in standing position. This method has few disadvantages, like:

- The seeds may not be properly distributed in the field.
- The seeds may fall in clusters at one place and at another place there may be none.
- The seeds may not get into the right depth and therefore, can be easily picked up by the birds.

**Sowing of seeds by using a seed drill**

A seed drill has a funnel shaped opening leading to long tubes. These tubes are attached to a plough. Seeds are put into the funnel. As the plough makes burrows in the soil, the seeds are deposited, at right distance and right depth, in the soil by the drill. The method of sowing seeds by using a seed-drill is better than broadcasting as the seeds are sown at regular intervals and at a proper depth.

Moreover, this method of sowing is much faster and economical.

All type of seeds, except very light weight, can be sown by this method.

5. **Sowing of seedlings by transplantation method** : For certain crops the seeds (seedlings) are not directly sown in the field. Instead, they are first sown in nurseries and then the seedlings are transferred to a field. This is known as *transplantation*. The method of sowing seedlings has few advantages like:

(i) It enables the farmers to select the healthier seedlings.

(ii) It allows better development of root and shoot system of plants.

(iii) It allows proper spacing between the plants so that they get proper sunlight, water and nutrients.

(iv) The plants which are grown by transplantation method includes:
Rice, chillies, brinjal, tomato, onion and cauliflower, etc.

6. The manure is added to the fields to get better crops. As the plants grow on the soil they keep using some nutrients from the soil according to their need. The plants grown on that soil will suffer from that deficiency and will not be healthy. Therefore it is important the nutrients of the soil must be replaced. This is done by adding manure or fertilizer to the soil.

**Use of Manure**

Manure is natural substance prepared from decomposition of plant and animal wastes (such as cow dung, animal bones, dead leaves, dead insects and vegetable wastes) by the action of microbes. Manure is rich in humus (organic matter) which is very useful for the plants. It restores the water retention ability of soil. Once obtained in decomposed form, it is not harmful to the environment.

**Use of Fertiliser**

Fertilizers are the organic compounds containing nutrients such as nitrogen, potassium and phosphorus. They are made in the factories. Different fertilizers are used for different plants according to their requirement. They provide nutrients to the soil immediately in concentrated form. They increase the crop production several times. They are harmful to the environment as they change soil chemistry and destroy useful microorganisms in the soil.

7. Supplying of water to the crops from the wells, canals or water reservoirs is known as **irrigation**. The irrigation from wells, tanks and canals was practised throughout India in the ancient times. A new water lifting device such as Persian wheel had been adopted and is still widely used. It consists of a leather bag with ropes pulled by bullocks to draw water from the wells for irrigation.

8. In a field, many unwanted plants grow along with the main crop. These unwanted plants are known as **weeds**. They compete with the main crops for water, soil nutrients, sunlight and thus hamper the growth of the crop plants. They also spread pests onto the crops and sometimes produce poisonous substances which are harmful to the crop, thus reducing the yield of crop. So, the weeds must be destroyed. The process of removing weeds is called **weeding**.

**Examples of weeds** : Parthenium (Congress weed), Amaranthus (Chaulai), Chenopodium (Bathua), Wild oat, Grass and Convolvulus, etc.

**Methods of removing weeds** :

Weeds can be removed by using various methods, like :

1. **Manual method** : It involves uprooting the weeds manually.
2. **By using tools** : It involves using tools like harrows, spades or trowel (khurpa).
3. **By chemical method** : It involves spraying chemicals called
weedicides which destroy the weeds. Metachlor; Butachlor; Dalapon; 2, 4-D (2, 4 dichlorophenoxy acetic acid( and 2, 4, 5-T (2, 4, 5 trichlorophenoxy acetic acid) are the commonly used weedicides.

4. **By biological control method** : This method of weed control involves use of insects or some other organisms which destroy the weed plants only without affecting the crop plants.

9. Rodents like rats and mice cause considerable damage to crops both in the field and in storage. They spoil greater quantity of grains with their hair, urine, etc., then the quantity they consume.

Birds like sparrows, parrots, pigeons and crows also feed on grains, seeds and fruits.

**Control** : Crops can be protected by using chemicals that kill pests, called pesticides or insecticides. Rodenticides are chemicals used to kill rodents. Malathion, parathion, aldrin, endrin, heptachlor. BHC and disyston are some of the commonly used insecticides. Blitox, dithane, lime, sulphur and bordeaux mixture are some of the commonly used fungicides (chemicals used to kill fungi).

Birds can be scared always from fields by planting scarecrows. Rodents can be controlled by keeping baits in places they frequent. The baits contain certain chemicals that kill them. These chemicals are called rodenticides.

Pesticides and fungicides are sprayed on fields either by hand-operated machines or by low-flying aircraft.

10. The rearing of hens, chicken for their eggs or their meat is known as poultry farming. Poultry birds are egg laying birds such as chicken, ducks, geese, turkey, etc.

The feed for the poultry must include carbohydrates, proteins, minerals and vitamins.

The poultry birds are given cereals like wheat, maize, jawar, bajra, rice, etc. The hens lay about 60-70 eggs annually. The hybrid hens not only have more yield but are also disease resistant. The intake of food also depends on the yield of the birds. The high yielding birds consume more food than the desi breeds.

Some high yielding breeds of hens are:

(i) White Leghorn
(ii) Plymouth

The hens are groomed for their eggs whereas broilers (chicken) are groomed for their meat.

B. **Difference between** :

1. Manure is natural substance prepared from decomposition of plant and animal wastes by the action of microbes.

Fertilizers are the organic compounds containing nutrients such as nitrogen, potassium, and phosphorus.

2. Bacterial diseases occurs in potato, tomato, brinjal, groundnut, etc. The
xylem tissue of the affected plant gets blocked by the disease and water cannot be transported to different parts of the plant. As a result, it wilts and dies. Mosaic is a viral disease mainly affecting tobacco, potato, cucumber, etc. Tobacco mosaic virus causes the mosaic disease in tobacco. This disease results in the formation of pale patches on the leaf giving it a mosaic appearance.

3. Insects are the small six-legged animals. Some insects can even fly. Some examples of insects are locusts, grasshoppers, weevils, termites, beetles, etc. They harm plants in different ways. Rodents include rats and mice, They are very small animals. They can be seen running in fields and storage houses. They spoil greater quantity of grains with their hair, urine, etc. than the quantity they consume.

4. The cutting and collecting the matured crop from the fields is called harvesting.

5. Dairy breeds and drought breeds are two categories of cattle. Dairy breeds include the animals which are raised for milk. These are the female milch animals such as cows, buffaloes, etc. Drought breeds include the animals which are used for work. These are the male animals such as oxen, male buffaloes, etc.

C. Fill in the blanks:

D. Write ‘T’ for true and ‘F’ false statements:

E. Tick the right option:
1. b 2. a 3. a 4. c 5. a 6. a

F. Match the following:
1. e 2. a 3. b 4. c 5. d

G. Define the following:
1. Soil preparation involves two main steps ploughing and leveling. Ploughing refers to the turning or loosening of the soil. Whereas, leveling refers to the process of making the soil surface smooth and even.
2. Supplying of water to the crops from the wells, canals or water reservoirs is known as irrigation.
3. The process of removing weeds i.e. unwanted plants is called weeding.
4. Threshing is the process by which the grains are released from the chaff. This is done either by hand or by using animals such as bullocks or camels.
5. Storing of food grains and vegetables for future use is called storage.
6. Rearing and management of fish for large scale production is called pisciculture.
7. Dual breeds include the cattle where females are food milk producers and food for work.