Chapter 1: Exploring the Investigative World of Science

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (b) 2. (d) 3. (b) 4. (a) 5. (a)

B. Fill in the blanks:

1. Vaccines 2. Microorganisms 3. Electricity

4. Force 5. Solid, liquid, gas

C. Write T for true or F for false:

1. T 2. F 3. T 4. T 5. T

D. Answer the following questions:

1. In electric heating appliances: All electrical heating appliances are based on the heating effect of current. For example, appliances, such as electric iron, water heaters and geysers, room heaters, toaster, hot plates/cooking ranges, are fitted with heating coils made of high resistance wire such as nichrome wire.
2. Forces are responsible for changes in motion (acceleration) and can also cause objects to deform or change shape. Forces can cause objects to speed up, slow down, or change direction. For example, we can increase the speed of cycle by applying force on pedals or can stop it by applying brakes.
3. The three common states of matter are solid, liquid, and gas.Solids have a definite shape and volume, while liquids have a definite volume but take the shape of their container. Gases have no definite shape or volume, and plasma is an ionized gas.
4. Light is a fundamental form of energy in the universe that allows us to see and enables various natural processes like photosynthesis.
5. Mirrors have numerous applications, including in telescopes, microscopes, and various optical instruments. They are also commonly used in everyday

life, such as in shaving mirrors, car mirrors, and decorative mirrors, according to some online educational resources.

6. The Moon's phases are the different appearances of the Moon as seen from Earth, caused by the changing angles at which we view the illuminated portion of the Moon as it orbits our planet. There are eight main phases: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, and waning crescent, with the cycle repeating roughly every 29.5 days.

Chapter 2: The Invisible Living World: Beyond our Naked Eye

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (c)	2. (b)	3. (a)	4. (a)
5. (b)	6. (b)	7. (a)	8. (d)
9. (a)	10. (d)		

B. Fill in the blanks:

1. multicellular	2. Netherlands	3. cell membrane	4. Lactose
5. microorganisms	6. fermentation	7. Algae, fungi	8. colonies

C. Write 'T' for True and 'F' for false:

1. T	2. F	3. T	4. T
5. T	6. T	7. T	8. T

D. Match the columns:

1. - c	2.- d	3. -a	4. - e	5. - b

E. Short answer type questions:

1. A cell is the basic structural, functional, and biological unit of all known living organisms, serving as the fundamental building block of life.
2. The part of the cell that contains organelles is the cytoplasm.
3. Cytoplasm is the gelatinous liquid that fills the inside of a cell. It is composed of water, salts, and various organic molecules. Some intracellular organelles, such the nucleus and mitochondria, are enclosed by membranes that separate them from the cytoplasm.
4. The primary function of the nucleus is to serve as the cell's control center by housing and protecting the DNA, which contains the cell's genetic instructions. It regulates gene expression by overseeing processes like DNA replication and transcription, and also contains the nucleolus, where ribosomes are synthesized for protein synthesis.
5. Mitochondria are double-membraned organelles in eukaryotic cells, often called the "powerhouses of the cell" because they convert food into usable energy in the form of adenosine triphosphate (ATP) through a process called cellular respiration. They also contain their own DNA (mt DNA), which encodes some essential proteins and is inherited from the mother.
6. Micro-organisms are classified into five major groups:
   1. Viruses 2. Bacteria 3. Fungi
   4. Algae 5. Protozoa
7. Moderately warm conditions with air moisture are the main causes of growth of microbes.
8. Food poisoning, also called foodborne illness, is an infection or irritation of your digestive tract that spreads through food or drinks. Viruses, bacteria, and parasites cause most food poisoning. Harmful chemicals may also cause food poisoning.
9. Fermentation is the process in which a substance breaks down into a simpler substance. Fermentation refers to the metabolic process by which organic molecules (mainly carbohydrates, such as starch or a

sugar) are converted into acids, gases, or alcohol in the absence of oxygen or any electron transport chain.

10. The fungus penicillium notatum is used in the manufacture of penicillin, the first antibiotic to be discovered. Brown algae are a rich source of iodine and potassium.

F. Long answer type questions:

1. Unicellular organisms are living things made of a single cell that performs all life functions, such as bacteria and amoebas. Multicellular organisms consist of many specialized cells that work together to form tissues, organs, and systems, like plants and animals.
2. Do yourself
3. **Plastids** are present in plant cells only. The plastids contain certain pigments which have a specific role to play in the functioning of the plant.

   Depending upon their pigment colour, plastids are classified as follow:

   Chloroplast: The colour of leaves of the tree is green due to presence of chloroplast, which contain the green pigment chlorophyll. Chlorophyll is responsible for the process of photosynthesis in plants.

   Chromoplast: These plastids are responsible for imparting colour to fruits and flower.

   Leucoplasts*:* These plastids store food in the form of carbohydrates, fats, and proteins.

   Centrosome: It is located near the nucleus in animal cells. Plant cells do not have centrosome. The main function of centrosome is to initiate and regulate cell division.

   Lysosomes: They are paresent in animal cells only. Lysosomes contain enzymes that are capable of digesting cells and a variety of intra and extra –cellular materials. In times of emergency, lysosomes burst and destroy the cell. Hence, they are also called suicide bags of the cell.

4. The epithelium is a type of body tissue that forms the covering on all internal and external surfaces of your body, lines body cavities and hollow organs and is the major tissue in glands.
5. These organisms are not visible by naked eyes since they are very small. They can be seen through microscope that's why they are called Micro-organisms or microbes. Microbes enter our body through the air we breathe, the water we drink or the food we eat. They are also transmitted by direct contact with an infected person or carried through an animal.
6. Sometimes, we suffer by food poisoning; it is due to the consumption of spoilt food by growth of micro-organisms in it. So, we need to preserve food items. These microbes produce toxic substance in it. We can preserve raw food material and cooked food material by applying some methods. Pulses, spices, dry fruits and other food items can be dehydrated by putting these in sunlight the process of removal of water from a substance is known as dehydration. Cooked food are preserved by boiling or refegerating.

Assertion-Reason Based Questions

1. (a) Both A and R are true and R is the correct explanation of the Assertion.
2. (c) A is true but R is false.

Chapter 3: Health: The Ultimate Tresure

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (d) 2. (c) 3. (c) 4. (a) 5. (b)

B. Fill in the blanks:

1. Proteins 2. Roughage 3. Balanced diet
4. Minerals, vitamins 5. Communicable diseases

C. Write T for true or F for false:

1. T 2. T 3. F 4. T 5. T

D. Short answer type questions:

1. A food with all essential nutrients in right proportion is called a balanced diet.
2. Goitre is caused due to deficiency of iodine.
3. Three diseases caused by contaminated water and food are Cholera, Typhoid Fever, and Hepatitis A.
4. Hygiene encompasses the practices and conditions necessary for maintaining health and preventing the spread of disease, involving the cleanliness of the body, the home, and the environment. Keeping a house neat and clean is essential because it eliminates disease-causing microbes, allergens, and pests, thereby protecting occupants from illnesses, allergies, and respiratory problems. A clean home also improves mental well-being, creating a safer, more comfortable, and less hazardous living space.
5. Diseases spread through the air when infectious bacteria or viruses are expelled into the air as small droplets or aerosols when an infected person coughs, sneezes, laughs, or breathes, and then inhaled by a nearby healthy person. These airborne particles, containing the pathogens, can remain suspended in the air for a period, allowing for transmission to others who are in the same space.

E. Long answer type questions:

1. Communicable diseases spread from one person or animal to another, typically caused by pathogens like bacteria or viruses, whereas non-communicable diseases (NCDs) do not spread between people and are usually caused by a combination of genetics, lifestyle choices (such as poor diet or inactivity), and environmental factors.
2. Communicable diseases spread through direct contact (like touching an infected person or their body fluids), indirect contact (through contaminated objects, food, or water), via airborne droplets or particles

(from coughing or sneezing), or through vectors (like insect or animal bites). They can also be transmitted from mother to unborn child during pregnancy or birth.

3. Deficiency diseases are health conditions caused by the long-term lack of essential nutrients, such as vitamins, minerals, proteins, and carbohydrates, in the diet. These nutrients are vital for the body's proper growth, development, and functioning, and their absence leads to various health problems. For example, a Vitamin C deficiency can cause scurvy, characterized by swollen gums and fatigue, while an iron deficiency can lead to anemia.

4.

Vitamin/Mineral	Sources	Deficiency Disease
Vitamin A	Milk, carrot, tomato, mango, spinach, milk products	Night blindness (cannot see well at night)
Vitamin B	Bread, nuts, milk products green vegetables, meat	Beri-Beri (affects nerves and muscles)
Vitamin C	Orange, tomato, amla, green leafy vegetables	Scurvy (results in bleeding of gums, swelling of joints)
Vitamin D	Sunlight, milk, cooking oil	Rickets (affect the bones and
Iron	Apple, spinach, banana meat, guava, brinjal	Anaemia (looks pale and tired)
Calcium and Phosphorus	Milk and its products, fish	Improper development of teeth and bones
Iodine	Sea food, Iodised salt	Goitre (swelling of gland in the neck)

5. To maintain a healthy lifestyle, focus on eating a balanced diet rich in fruits, vegetables, and whole grains, while limiting saturated fat, sugar, and salt. Engage in regular physical activity for at least 150 minutes per week, incorporating activities you enjoy. Prioritize 7-9 hours of quality sleep nightly and manage stress effectively. Additionally, stay hydrated, limit or avoid alcohol and smoking, and maintain a healthy body weight to prevent diseases.

6.

a. Exercise strengthens muscles and improves mood.

b. Water maintains cellular function and aids digestion.
c. Roughage (fiber) adds bulk to stool, preventing constipation and promoting gut health by feeding beneficial bacteria.
Together, they are crucial components of a balanced lifestyle, supporting overall physical and mental well-being by ensuring the proper functioning of bodily systems, from nutrient transport to waste removal.

7. We get carbohydrates for energy, proteins for growth and repair, and fats for energy storage and cell function from food. Other essential nutrients include vitamins and minerals, which regulate bodily processes like immunity and bone health, and water, crucial for temperature regulation and waste removal. Fiber, a type of carbohydrate, aids digestion.

8. A clean environment is essential for good health because it directly reduces the risk of disease transmission, improves physical and mental well-being, and ensures access to vital resources like clean air, water, and food. By preventing exposure to pollutants, pathogens, and allergens, a clean environment allows people to remain healthy, productive, and more energetic, fostering a higher quality of life for everyone.

9. Communicable diseases are illnesses caused by pathogens like viruses, bacteria, fungi, and parasites that can spread from one person to another. They spread through various routes, including direct physical contact, inhaling airborne particles from coughs and sneezes, consuming contaminated food or water, or through vector-borne transmission from insect or animal bites. Common examples include influenza, tuberculosis, and malaria, and they can be prevented through practices like handwashing, vaccination, and avoiding sick individuals.

10. Non-communicable diseases (NCDs) are chronic illnesses that are not transmitted from person to person but are caused by a combination of genetic, physiological, environmental, and behavioral factors, such as

genetics, diet, physical activity, and substance use. For examples of NCDs include cardiovascular diseases (like heart disease and stroke), cancers, chronic respiratory diseases (such as asthma and COPD), and diabetes.

Chapter 4: Electricity: Magnetic and Heating Effects

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

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

B. Fill in the blanks:

1. Bad	2. Good	3. Good, salts, minerals
4. positive	5. Free ions	6. Straight
7. electromagnet	8. electromagnet	

C. Write T for true or F for false:

1. F	2. T	3. F	4. T	5. T
6. F	7. F	8. T		

D. Short answer type questions:

1. Materials which allow electric current to pass through them, are good conductor of electricity such as metals (iron, copper, silver, gold, aluminium etc.), graphite (lead of pencil).
2. The materials which do not allow electric current to pass through them, are called bad conductors or insulators of electricity such as rubber, plastic, wood etc.

3. Electrical conductivity is a measure of how easily an electric current can flow through a material.
4. Ions are atoms or groups of atoms that carry a net electrical charge, formed when the number of electrons doesn't equal the number of protons. Iron itself is a metallic element, but in the context of an electric current, iron ions can act as charge carriers, facilitating the flow of electricity in certain situations.
5. An LED bulb uses a light-emitting diode (LED) to produce light, which is a solid-state semiconductor device that converts electrical energy directly into light through electroluminescence.
6. Common salt (sodium chloride) is a good conductor of electricity when in a liquid state (either molten or dissolved in water) because its ionic structure breaks down into free-moving, charged ions (Na+ and Cl-), which can carry an electric current.
7. Yes, some liquids conduct electricity, specifically electrolytes, which are solutions of acids, bases, or salts that contain free-moving ions. Pure distilled water is a poor conductor because it lacks ions, but tap water is a conductor due to dissolved minerals and salts. The movement of these charged ions in the liquid creates an electric current.
8. An electrode is a conductor of electricity, often a metal or graphite, that serves as a point of contact for current to enter or leave a non-metallic component of an electrical circuit, such as an electrolyte in a battery or a semiconductor.

E. Long answer type questions:

1. To test orange juice conductivity, create a circuit with a battery (or multimeter), wires, and two electrodes. Connect the electrodes to the orange juice, with the juice completing the circuit, and observe if a connected light bulb lights up or if a multimeter registers a voltage reading, indicating the presence of ions that facilitate the flow of electricity.
2. An electrolytic cell uses external electrical energy from a power source to drive a non-spontaneous redox reaction. It consists of a container with an

electrolyte (molten or aqueous solution), two electrodes (anode and cathode), and a power source, which facilitates electrolysis, the process of using electricity to decompose chemical compounds.

3. Electrolysis is the passing of a direct electric current through an electrolyte which is producing chemical reactions at the electrodes and decomposition of the materials. The main components required to achieve electrolysis are an electrolyte, electrodes, and an external power source.
Electrodes allow the electric current to enter or leave the electrolytic solution. The electrodes are two in number and are made of metal or carbon.

4. Copper is purified through electrolytic refining (or electro-refining), a process that uses electricity to separate pure copper from impure copper. An impure copper block serves as the anode (positive electrode), and a pure copper strip acts as the cathode (negative electrode), immersed in a copper sulfate solution. At the anode, copper dissolves into the solution as ions, while more reactive metal impurities dissolve and fall as sludge, and less reactive metals (like gold and silver) also form sludge. At the cathode, copper ions from the solution gain electrons and deposit as pure copper.

5. Electroplating is an electrolytic process that coats an object with a thin layer of metal, improving its appearance, wear resistance, and corrosion protection. The object to be plated acts as the cathode, and the metal to be deposited is the anode, with a current passing through an electrolyte solution to transfer metal ions onto the object's surface. Common uses include galvanizing iron, silver-plating cutlery, and plating automotive parts for durability and shine.
6. An electric bell works by repeatedly making and breaking an electrical circuit, using an electromagnet to strike a gong. When the circuit is completed, current flows to the electromagnet, which pulls a spring-loaded armature and its attached hammer to strike the bell. This movement simultaneously breaks the circuit, causing the electromagnet to lose its

magnetism and the spring to pull the armature back. The circuit then re-completes, and the cycle repeats, causing a continuous ringing sound as the hammer strikes the gong repeatedly.

7. The magnetic effect of electric current is the phenomenon where an electric current flowing through a conductor produces a magnetic field around it. This magnetic field is invisible but can be detected with a compass and has both a strength and a direction, both of which depend on the current's magnitude and direction. This principle forms the basis for many devices, such as electromagnets and electric bells.
8. An electromagnet is a temporary magnet created when electric current flows through a coiled wire, typically around a soft iron core, which can be switched on and off and its strength controlled by the current. Common uses include heavy lifting cranes, doorbells, electric motors and generators, hard disk drives, and medical devices like MRI scanners.

Assertion Reason Based Questions

1. (b) Both A and R are true but R is not the correct explanation of the Assertion.
2. (d) A is false but R is true.

Chapter 5: Exploring Forces

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (d)	2. (c)	3. (a)	4. (a)
5. (b)			

B. Fill in the blanks:

1. reduce	2. force	3. contact	4. friction
5. less	6. Ball bearings	7. Non-contact force	

8. repel 9. Gravitational force 10. one - sixth

C. Write 'T' for true and 'F' for false:

1. F 2. T 3. T 4. F

5. T

D. Short Answer type questions:

1. A force is a push or a full acting on an object. It can change the state of an object.
2. When we push a door or lift a heavy bag, we need a force. Such types of forces are called muscular forces.
3. The force between electric charges is called electric force.
4. Objects or things fall towards the earth because it pulls them. This force is called the force of gravity or gravitational force.
5. Oiling and greasing to the moving parts of the machinery and automobiles. Ball bearing are used to reduce friction.

E. Long Answer type questions:

1. **Effects of Force**
   - A force can change the state of motion.
   - A Force can change the shape of an object.
   - A force can change the speed of moving object.
2. A contact force is applied on an object by direct or indirect physical contact. There are two type of contact forces such as muscular force and frictional force. In non- contact forces, there is no need of any physical contact between the objects. There are three type of non- contact force such as Magnetic force, Electric force, Gravitational force.
3. The force which opposes the motion of object is called force of friction or frictional force. The force of friction always acts on all the moving objects and its direction is always opposite to the direction of motion.

   Disadvantages of friction

- Due to friction moving parts of the machinery and automobiles are heated up, this may result in waste of energy, fuel and also causes wearing and tearing in the moving parts.
- Wear and tear of an object is not desirable because it reduce its life and efficiency. Wear and tear due to friction depends on two factors, the roughness depends on two factors, the roughness of the two surfaces in contact and the amount of time the two surfaces rub against each other.

4. **Friction is called necessary evil because**
    - We cannot hold anything in our hand.
    - We cannot walk, sit write etc.
    - We cannot stop, we will slip.
    - We cannot tie a knot in the rope.
5. Magnetic force exerted by magnets on each other and on some metals like iron and nickel. Since magnets attract iron so it is used to separate waste iron objects from garbage dumps so that they can be recycled.
6. Buoyancy is the upward force exerted by a fluid that opposes an object's weight. When an object is placed in a liquid, it displaces some of the liquid. If the buoyant force (the upward push of the displaced liquid) is greater than the object's weight, the object floats. If the buoyant force is less than the object's weight, the object sinks.

Assertion-Reason Based Questions

1. (b) Both A and R are true and R is not the correct explanation of the Assertion.
2. (b) Both A and R are true and R is not the correct explanation of the Assertion.

Case Study

1. (c)
2. (b)
3. When we push a door or lift a heavy bag, we need a force. Such types of forces are called muscular forces.
4. The force between electric charges is called electric force.

5. The force exerted by magnets on another magnet or magnetic objects like iron is called magnetic force.

Chapter-6: Pressure, Winds, Storms and Cyclones

Assessment Time

Multiple Choice Questions

A. **Darken the correct circle in the OMR sheet:**

1. (c) 2. (b) 3. (a) 4. (c)

5. (b) 6. (a)

B. Fill in the blanks:

1. pressure 2. Newton per square meter. 3. 760

4. decreases 5. mercury

C. Write 'T' for True and 'F' for false:

1. F 2. F 3. F 4. F

5. T

D. Short Answer type questions:

1. To cut vegetables and fruits, we use sharp edge of the knife since area is less, pressure is more by applying equal force.
2. Porters place a round piece of cloth on their heads to carry heavy load. By doing this they increase the area of contact of the load with their head. So, the pressure on their head is reduced and easy to carry the loads.
3. Foundation of walls of the houses has a large horizontal area. This reduces the pressure underneath so that the walls do not sink further into the ground under the weight of the building.
4. Skis have a large area to reduce the pressure on the snow so that they do not sink in too far.

5. Pressure increases with increase in depth. Dams are made stronger and thicker at the bottom than at the top to withstand the high pressures at greater depths.
6. Wind is caused by the uneven heating of the Earth's surface by the sun, which creates differences in air temperature and, consequently, atmospheric pressure. Warm air is less dense and rises, creating areas of low pressure, while cooler air is denser and sinks, creating areas of high pressure. Air naturally moves from high-pressure areas to low-pressure areas, and this movement of air is what we experience as wind.
7. Monsoon rains occur annually due to the large-scale seasonal reversal of winds caused by the differential heating of land and sea. During summer, the land heats up faster than the ocean, creating a low-pressure area over the continent. Moist winds from the cooler, high-pressure ocean then flow toward the land, rising, cooling, and releasing heavy rainfall over the Indian subcontinent. This process is a reliable, predictable phenomenon driven by Earth's axial tilt and orbit, ensuring similar patterns year after year.

8. A storm is a powerful atmospheric disturbance caused by differences in air pressure, moisture, and temperature, leading to winds, heavy precipitation, and other phenomena like lightning and thunder. Storms form when warm, moist air rises, creating an area of low pressure that draws in cooler, denser air from surrounding areas. This air cools and condenses to form clouds, and as the cycle of rising and falling air continues, the system grows, resulting in a storm.
9. During a storm, stay indoors in a sturdy building or a hard-topped vehicle, far from windows and water. Avoid going outside, and stay away from tall objects, utility poles, and downed power lines. If caught outdoors, crouch low in a depression, and do not lie on the ground. Unplug electronic devices connected to outlets and do not use corded phones or running water, as electricity can travel through these systems.

E. Long Answer type questions:

1. Pressure is defined as the force per unit area. The SI unit of pressure is Pascal (Pa), which is Newton per square meter.
2. Force = 8 N

   Area = 20 cm^2 = 20/10000 m^2

   Pressure = Force/ Area

   = 8 x 10000/20 = 4000 N/ m^2
3. The air inside the balloon exerts a pressure on the inner wall of the balloon. If we blow in too much air, and the material of the balloon is not capable of expanding further, increasing the pressure inside can cause the wall of the balloon to break at one or more points. This is why a balloon bursts when too much air is blown into it.
4. Atmospheric pressure is the air pressure which is exerted by the weight of air present in the atmosphere. Atmospheric pressure is due to the weight of air present in the atmosphere above us. Atmospheric pressure also acts in all directions. On the surface of earth, the atmospheric pressure is maximum at the sea level.
5. Vacuum cleaner works on the principle of creating a partial vacuum, which generates suction to draw in dust, dirt, and debris. This suction is created by a motor that powers the cleaner, and the air movement inside the machine is vital to its functioning.

Assertion-Reason Based Questions

1. (b) Both A and R are true and R is not the correct explanation of the Assertion.
2. (b) Both A and R are true and R is not the correct explanation of the Assertion.

Case Study

1. (b)
2. (c)
3. (a)
4. (a)

5. The suits protect astronauts from getting too hot or cold and also give astronauts oxygen to breathe while they are working in space. The suits hold water to drink during spacewalks. They also keep astronauts from getting hurt by space dust.

Chapter 7: Particulate Nature of Matter

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (c) 2. (b)

B. Fill in the blanks:

1. Particles 2. Interparticle 3. Most 4. liquids

C. Write T for true or F for false:

1. T 2. T 3. T 4. F

D. Answer the following questions:

1. Matter is anything that occupies space and has a definite mass. It includes all the materials found in universe. All matter is made up of substances which are further made up of particles. It is the arrangement of these tiny particles which decides the properties of a particular type of matter.
2. Solid, liquid and gas are different states of matter.
3. Liquid molecules are moderately close, in an irregular arrangement, and are mobile, meaning they are not fixed in place but can slide past one another. This allows liquids to have a definite volume but take the shape of their container, with intermolecular forces weaker than solids but stronger than gases.
4.

State of matter	Shape	Volume	Mass
Solid	Definite	Definite	Definite
Liquid	Take the shape of container	Definite	Definite
Gas	Take the shape of container	Occupy all the space available	Definite

Chapter 8: Nature of Matter: Elements, Compounds and Mixtures

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (a) 2. (c) 3. (b) 4. (d)

B. Fill in the blanks:

1. Elements, compounds 2. Elements 3. Water

4. mercury 5. CO_2

C. Write for true or for false:

1. F 2. T 3. T 4. T

5. T

D. Answer the following questions:

1. A mixture is a physical combination of two or more substances where each substance retains its original properties and isn't chemically bonded. Mixtures have no fixed composition, their components can be separated by physical methods, and they can be classified as homogeneous (uniform, like sugar water) or heterogeneous (non-uniform, like sand and water).
2. A compound is a substance made of two or more different elements chemically bonded together in a fixed ratio, resulting in a new substance with properties different from its constituent elements. For example,

water (H_2O) is a compound made from the elements hydrogen and oxygen, and table salt (NaCl) is a compound of sodium and chlorine.

3. A homogeneous mixture has components that are uniformly distributed, making its composition consistent throughout, while a heterogeneous mixture has components that are not evenly distributed, leading to a non-uniform composition where different parts may have different properties. Examples of homogeneous mixtures include saltwater and air, while examples of heterogeneous mixtures include salads and soil.
4. We call water a compound because it's a substance formed when two different elements, hydrogen (H) and oxygen (O), are chemically bonded together in a fixed ratio of two hydrogen atoms to one oxygen atom (H_2O). This chemical combination creates a new substance with distinct properties, unlike its constituent elements, and its composition remains constant, which are the defining characteristics of a compound.
5. Minerals are naturally occurring, inorganic solids with a specific chemical composition and an ordered internal crystal structure. They are the fundamental building blocks of rocks and have characteristic physical properties, such as hardness, luster, and colour, that help geologists identify them. Minerals are essential for life and are used in countless human applications, from construction and technology to cosmetics and food.
6. Minerals are vital for both human health and economic progress, serving as essential nutrients for biological functions like building bones and nerve transmission, and as critical raw materials for manufacturing, construction, and technology. From sustaining bodily processes to enabling modern infrastructure and industry, minerals are indispensable for a healthy and functional world.
7. Here are five examples of minerals and their common uses: Copper is used for electrical wiring due to its conductivity, Gypsum is a key

component in plaster and wallboard, Graphite makes up the "lead" in pencils, Halite is table salt used for seasoning food, and Bauxite is the primary ore for aluminum used in various manufacturing.

Chapter 9: The Amazing World of Solutes, Solvents and Solutions

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (b) 2. (a) 3. (b) 4. (c)

B. Fill in the blanks:

1. Solute 2. Solvent 3. Homogeneous

4. kinetic

C. Write for true or for false:

1. T 2. F 3. F 4. T

D. Answer the following questions:

1. Solubility is a physical property that describes the ability of a solid, liquid, or gas (the solute) to dissolve in another substance (the solvent), usually a liquid, to form a uniform solution.

2. Solubility is affected by the nature of the solute and solvent, temperature and pressure.

3. A unsaturated solution can dissolve more solute at a given temperature, a saturated solution contains the maximum amount of solute it can hold at that temperature, and a supersaturated solution holds more dissolved solute than a saturated solution, creating an unstable state.

4. Temperature's effect on solubility depends on the process: for solids in liquids, solubility generally increases with temperature.

5. Density is the mass of a substance per unit volume, calculated as mass divided by volume ($\rho = m/V$) and expressed in units like kg/m^3. Relative density (or specific gravity) is a dimensionless comparison of a substance's density to that of a reference substance, typically water at 4°C. It is the ratio of the substance's density to the density of water (Relative Density = Density of substance / Density of water).
6. Archimedes' Principle states that the upward buoyant force exerted on a body immersed in a fluid is equal to the weight of the fluid the body displaces. This principle explains why objects float or sink, as the buoyant force opposes the object's weight, and it applies to any fluid, including gases like air.

Chapter 10: Light: Mirrors and Lenses

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (a) 2. (b) 3. (c)

B. Fill in the blanks:

1. Mirror 2. Convex, thinner 3. concave

C. Answer the following questions:

1. Concave mirrors curve inward and converge light, forming various images (real/virtual, enlarged/diminished) depending on object placement, and are used in telescopes and shaving mirrors. Convex mirrors curve outward and diverge light, producing a wide field of view with virtual, diminished, upright images, used in side-view car mirrors to show a larger area.
2. Four common uses of a concave mirror include headlights and searchlights to create parallel beams of light, shaving and cosmetic mirrors to provide

magnified images, solar furnaces to focus solar energy, and dentist and medical instruments like the ophthalmoscope to view magnified images of body parts.

3. A convex lens is called a converging lens because its curved shape causes parallel light rays passing through it to bend inward and converge at a single point, known as the focal point or focus. The lens is thicker in the center and thinner at the edges, and this shape ensures that light rays striking the edges are refracted more sharply than those near the center, directing all incoming parallel rays to meet at the focal point on the opposite side of the lens.
4. Lenses are used for correcting vision in eyeglasses and contact lenses, for magnifying objects in magnifying glasses and microscopes, and for forming images in devices like cameras, projectors, and telescopes. They can also be found in various other applications, including binoculars, CD players and laser systems, and can function to attenuate light.

Chapter 11: Keeping Time with the Skies

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (b) 2. (d) 3. (b) 4. (b)

B. Fill in the blanks:

1. Moon 2. New moon 3. Waxing crescent
4. across 5. Saka calendar

C. Write T for true or F for false:

1. T 2. T 3. T 4. F

D. Answer the following questions:

1. There are eight main phases: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, and waning crescent.

2. A lunar calendar is a calendar system based on the monthly cycles of the Moon's phases, known as a synodic month, rather than the solar year, which is based on the Earth's orbit around the Sun. A purely lunar year, such as the Islamic calendar, consists of 12 lunar months, creating a year of about 354 days, which causes the months to drift 11 to 12 days earlier each solar year.
3. A solar calendar is a system for organizing time that is based on the Earth's revolution around the Sun, which determines the seasons. Unlike lunar calendars that track the Moon's phases, solar calendars focus on the solar year (approximately 365.25 days) to keep dates synchronized with seasonal changes. The most widely used solar calendar today is the Gregorian calendar, which uses a system of leap years to account for the extra fraction of a day each year.
4. The equinoxes (when day and night are equal in length) and solstices (when the sun reaches its northernmost or southernmost points) are also significant astronomical events that often coincide with festivals or are incorporated into their celebrations.
5. Artificial satellites are used for communication (internet, phone, TV), navigation (GPS), weather forecasting, Earth observation (monitoring climate, agriculture, and natural resources), scientific research, and military purposes like reconnaissance and surveillance. They transmit data, assist in global positioning, and observe the universe from orbit.

Chapter 12: How Nature Works in Harmony

Assessment Time

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (c) 2. (a) 3. (b) 4. (b)

B. Fill in the blanks:

1. Rain forests 2. fauna

3. fauna of the Pachmarhi Biosphere Reserve 4. forests

5. habitat 7. fauna 8.illegal 9. Satpura national Park

C. Write 'T' for True and 'F' for false:

1. T 2. T 3. F 4. T

D. Match the columns:

1. - e 2. - d 3. -a 4. -c 5. -b

E. Short Answer type questions:

1. The existence of a diverse variety of plants and animals and other living forms is known as biodiversity. Biodiversity is not evenly distributed across the earth. It is different place to place, it depends on the size and climatic conditions of the region.
2. Habitat is the place where particular animal live. Nature has given each of the species characteristic features to live in a particular environment in which they survive easily.
3. A species refers to a group or class of animals or plants having certain common and permanent characteristics that clearly distinguish it from other groups.
4. The plants and animals found in a particular area are termed flora and fauna of that area.

F. Long Answer Type questions:

1. Deforestation is the process in which large areas of forest lands are cleared for various human activities. Deforestation has many negative effects on our environment, like loss of habitat for animals and climate change.

2. Biodiversity is essential for the processes that support all life on Earth, including humans. Without a wide range of animals, plants and microorganisms, we cannot have the healthy ecosystems that we rely on to provide us with the air we breathe and the food we eat.

3. Developing protective areas such as national parks, wildlife sanctuaries to protect the animals in their natural habitat. The endangered and vulnerable species can be kept in captivity in places such as zoos and bred to increase their population. The cutting of forests should be strictly prohibited.
4. Migration is the movement of animals and birds in masses in search of food and water and to escape from extreme weather conditions. It is the adaptation to escape from hard conditions of their habitat and to return to their habitat when the conditions become favourable. The birds living in these regions migrate to warmer places on the earth.

Assertion-Reason Based Questions

1. (a) Both A and R are true and R is the correct explanation of the Assertion.
2. (c) A is true but R is false.

Case Study

1. (c)
2. (d)
3. The natural environment of plants and animals where they live, breed and multiply is called its habitat.
4. The species of plants living in their habitat is called flora.
5. The species of animals living in their habitat is called fauna.

Chapter 13: Our Home: Earth, a Unique Life Sustaining Planet

Multiple Choice Questions

A. Darken the correct circle in the OMR sheet:

1. (b) 2. (d) 3. (b) 4. (d)
5. (d)

B. Fill in the blanks:

1. Mercury 2. Reddish- brown 3. Third 4. Mercury
5. ozone layer

C. Write for true or for false:

1. T **2. T** **3. F** **4. F** **5. T**

D. Answer the following questions:

1. Earth is called a unique planet because it is the only known planet to support life as we know it, due to its specific combination of factors like liquid water, a life-supporting atmosphere with the right gases, a protective magnetic field, and a stable climate. These conditions allow for diverse ecosystems and a complex web of interconnected life forms found nowhere else in the universe.

2. The hydrologic cycle, or water cycle, is the continuous process by which water circulates between the Earth's surface, atmosphere, and underground, driven by the sun's energy and gravity. Key processes include evaporation (water to vapor), condensation (vapor to liquid/ice), precipitation (water falling back to Earth), and runoff (water flowing over the land). This cycle recycles water, maintains its balance, and is vital for all life on Earth.

3. Rock soil minerals are vital for life because they form the basis of our food chain by providing nutrients for plants, which are then consumed by animals and humans. They also contribute to a healthy environment by anchoring plant roots, retaining water, and filtering water as it passes through the soil. Furthermore, rocks provide raw materials for human civilization, supporting everything from building structures to producing essential items like fertilizers, energy sources, and even medicines.

4. Biodiversity is the incredible variety of all living organisms on Earth, including plants, animals, fungi, and microorganisms, and the different ecosystems they form.

5. The primary cause of the current accelerated disappearance of life on Earth is human activity, though natural events have also caused mass extinctions throughout history. The interconnected factors driven by human actions are often referred to as the "evil quartet" of habitat loss, overexploitation, alien species invasions, and co-extinctions.

6. Ecosystems are maintained by the continuous flow of energy, the cycling of nutrients, and the complex interactions between biotic (living) and abiotic (non-living) factors. Key processes include primary production (photosynthesis), decomposition, and the dynamic relationships between species, such as predator-prey interactions, all of which are supported by abiotic elements like sunlight, water, and soil.
7. Asexual reproduction is a biological process where a single parent produces genetically identical offspring, known as clones, without the involvement of sex cells (gametes). This method allows for rapid population growth because it doesn't require a mate and can happen in isolation. Common methods of asexual reproduction include binary fission (dividing into two), budding (a new organism grows from an outgrowth), fragmentation (the parent breaks into fragments that develop into new individuals), and vegetative propagation (asexual reproduction in plants).
8. Sexual reproduction in animals involves the fusion of male and female gametes (sperm and egg) to create offspring with genetic material from both parents. This process, called fertilization, results in a zygote, which develops into an embryo and eventually a new individual. Most animals reproduce sexually, though some species also exhibit asexual reproduction.
9. Sexual reproduction in plants, particularly flowering plants, involves the fusion of male and female gametes (sex cells) to produce seeds, which contain an embryo (baby plant) that can develop into a new plant. This process relies on pollination, the transfer of pollen from the male part of a flower (anther) to the female part (stigma), and fertilization, where the male gamete unites with the female gamete in the ovule to form a seed. When birds or animals eat the fruit, the seeds often get dropped far from the original plant — a helpful way for plants to spread. That's how a banyan seed, dropped by a bird that ate a fruit and excreted the seed, might sprout in a crack in a wall after the rains.

10. Several major threats endanger life on Earth. These include climate change, pollution, habitat loss, overexploitation of resources, and the introduction of invasive species. These factors can lead to biodiversity loss, ecosystem disruption, and ultimately, hardship for both humans and other species.