ASSERTION AND REASON QUESTIONS

For these questions, two statements are given – one labelled *Assertion* (A) and the other labelled *Reason* (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

(a) Both A and R are true and R is correct explanation of the assertion.

(b) Both A and R are true but R is not the correct explanation of the assertion.

(c) A is true but R is false.

(d) A is false but R is true.

Chapter 1: Nutrition in Plants

1. **Assertion:** Some bacteria and all green plants are autotrophs.
   Reason: Organisms that make their food from simple substances are called autotrophs.
2. **Assertion:** Stomata are present mostly on the undersurface of leaves.
   Reason: Stomata help in the transportation of water and minerals to the leaves.
3. **Assertion:** Oxygen is released during photosynthesis.
   Reason: Plants need oxygen for respiration.
4. **Assertion:** Dodder plant has special root-like structures called haustoria.
   Reason: Haustoria help to absorb food from the root or stem of host plant.
5. **Assertion:** Lichens are parasitic organisms.
   Reason: The fungus in lichen provides shelter, water and minerals to the alga.

Chapter 2: Nutrition in Animals

1. **Assertion:** There are two pairs of salivary glands in the mouth.
   Reason: Saliva contains an enzyme which digests starch.
2. **Assertion:** Scavengers are called nature's cleaners.
   Reason: Scavengers feed on the body of dead animals.
3. **Assertion:** In *Amoeba*, food is digested inside the food vacuole.
   Reason: Pseudopodia are finger-like projections of the body.
4. **Assertion:** The centre of each tooth has a pulp of blood and nerves.
   Reason: The pulp is surrounded by a layer of enamel.
5. **Assertion:** Pancreatic enzymes help to complete the digestion of carbohydrates, fats and proteins.
   Reason: Liver is the largest gland in the body.

Chapter 3: Fibres

1. **Assertion:** The body of sheep is shaved mostly in spring or early summer.
   Reason: Shaving the body of sheep to get fleece is called shearing.
2. **Assertion:** Merino wool is considered of good quality.
   Reason: The number of curls per centimetre defines the quality of wool.
3. **Assertion:** Tassar is the best quality of silk.
   Reason: Tassar is a wild variety of silk.
4. **Assertion:** The process of unwinding silk filaments from the cocoon is called throwing.
   Reason: Hot and cold treatment of cocoons is called softening of sericin.
5. **Assertion:** The larvae of silk moth are called caterpillars.
   Reason: Caterpillars feed on the neem leaves and grow in size rapidly.

Chapter 4: Heat and Temperature

1. **Assertion:** The heat is a form of energy which makes a body hot.
   Reason: When we rub our palms together, heat energy is generated.
2. **Assertion:** When a body possesses heat energy, it tends to become hot.
   Reason: When some heat is lost by a body, it becomes hotter than before.
3. **Assertion:** Energy can neither be created nor destroyed.
   Reason: In a steam engine, heat energy is transformed into mechanical energy.
4. **Assertion:** A device used for measuring the temperature of a body is called thermoscope.
   Reason: The freezing point of water is taken as 32 degree on Fahrenheit scale.
5. **Assertion:** The capillary tube of a clinical thermometer has a kink a little above the bulb.
   Reason: The kink in capillary tube prevents the mercury from falling back.

Chapter 5: Transfer of Heat

1. **Assertion:** Transfer of heat in solids occurs by conduction.
   Reason: In conduction, heat is carried from one particle to another due to vibrations.
2. **Assertion:** All materials do not conduct heat through them.
   Reason: Materials which conduct heat through them easily are called insulators.
3. **Assertion:** The handles of utensils are generally made of wood or plastic.
   Reason: Wood and plastic are poor conductors of heat.
4. **Assertion:** The sea breeze is formed during daytime.
   Reason: The convection current from sea towards land causes sea breeze.
5. **Assertion:** The bottom of cooking utensils is painted black.
   Reason: The black colour is a good absorber as well as a good radiator.

Chapter 6: Acids, Bases and Salts

1. **Assertion:** Green apples are sour due to the presence of malic acid.
   Reason: Acid containing substances generally taste sour.
2. **Assertion:** Acids react with carbonates to form salts and carbon dioxide.
   Reason: The reaction of an acid with a base is called neutralisation reaction.
3. **Assertion:** Bases are bitter in taste and produce a soapy feeling.
   Reason: Bases are not corrosive or harmful.
4. **Assertion:** Sodium hydroxide is used as an acid-base indicator.
   Reason: Sodium hydroxide is also called caustic soda.
5. **Assertion:** Salts are formed by the reaction of an acid with a base.
   Reason: Quicklime is used to neutralise acidic soil.

Chapter 7: Physical and Chemical Changes

1. **Assertion:** Most of the physical changes are reversible.
   Reason: No new substance is formed during a physical change.
2. **Assertion:** Digestion of food is a chemical change.
   Reason: In our stomach, food undergoes chemical reactions and changes into new substances.
3. **Assertion:** When hydrochloric acid is added to zinc granules, heat is released and test tube becomes warm.
   Reason: Release of energy in the form of heat shows a chemical change.

4. **Assertion:** Rust is a reddish-brown substance that appears on the surface of iron articles.
   Reason: Rusting is a very common chemical change.
5. **Assertion:** The process of depositing a layer of zinc on iron is called alloying.
   Reason: Alloying prevents rusting of iron articles.

Chapter 8: Weather, Climate and Adaptations

1. **Assertion:** A person who studies and records weather changes and makes weather forecast is called a meteorologist.
   Reason: Weather keeps changing every day and may even change hour-to-hour.
2. **Assertion:** Afternoon is the coldest time and early morning is the hottest time of a day.
   Reason: When heat escapes during night, the temperature falls down.
3. **Assertion:** Relative humidity is measured by a device called hygrometer.
   Reason: Rainfall is measured by using a device called anemometer.
4. **Assertion:** Torrid zones are hot and humid zones.
   Reason: Torrid zones are located around the equator.
5. **Assertion:** A thick layer of fat present under the skin of some animals is called blubber.
   Reason: Blubber prevents loss of body heat and protects from extreme cold.

Chapter 9: Wind, Storm and Cyclones

1. **Assertion:** The thick layer of air found around the earth is called atmosphere.
   Reason: The atmosphere extends up to nearly 50 km above the earth's surface.
2. **Assertion:** Winds always move from a region of high pressure to a region of low pressure.
   Reason: Winds are caused due to change in temperature and pressure of the air.
3. **Assertion:** The air above the land becomes very hot during daytime and rises up.
   Reason: The cooler and denser wind to flow from the oceans towards the land.
4. **Assertion:** Cyclones are violent storms which are accompanied by strong winds and heavy rains.
   Reason: Cyclones can be prevented with the help of anticyclone device.
5. **Assertion:** A wind vane is used to find the direction of the wind.
   Reason: Weather forecast can help to save lives and protect property.

Chapter 10: Soil

1. **Assertion:** Soil contains particles of different sizes.
   Reason: A vertical section of soil showing its different layers is called soil profile.
2. **Assertion:** Bedrock is a soft and porous rock.
   Reason: Bedrock produces soil over a long period of time.
3. **Assertion:** Humus contains all the nutrients required by the plants for their growth.
   Reason: Humus kills the earthworms present in soil.
4. **Assertion:** Sandy soil contains much space between its particles.
   Reason: Sandy soil can hold much water in its large spaces.
5. **Assertion:** Loamy soil is the most fertile soil.
   Reason: Loamy soil has sufficient water-holding capacity.

Chapter 11: Respiration in Animals and Plants

1. **Assertion:** Energy is released during oxidation of food.
   Reason: Oxidation of food also produces carbon dioxide.

2. **Assertion:** Most of the animals and plants have aerobic respiration.
   Reason: Organisms that use oxygen for respiration are called aerobes.
3. **Assertion:** In the nasal passages, air is filtered, warmed and moistened before entering the lungs.
   Reason: The opening of epiglottis is guarded by larynx.
4. **Assertion:** During exhalation, ribs are raised upwards and outwards.
   Reason: The volume of thoracic cavity increases and the air pressure inside the lungs decreases.
5. **Assertion:** The number of times a person breathes in a minute is called breathing rate.
   Reason: Breathing rate increases during fast running and heavy exercise.

Chapter 12: Transportation in Animals and Plants

1. **Assertion:** Blood supplies food from intestine to every cell of the body.
   Reason: Blood flows inside the blood vessels.
2. **Assertion:** Red blood corpuscles provide red colour to the blood.
   Reason: Red blood corpuscles contain a red-coloured pigment called haemoglobin.
3. **Assertion:** White blood corpuscles are called soldiers of the body.
   Reason: White blood corpuscles fight against the germs that enter our body.
4. **Assertion:** Arteries carry oxygenated blood from the heart to body organs.
   Reason: The valves present in arteries make the blood to flow only in one direction.
5. **Assertion:** Ventricles are collecting chambers of the heart.
   Reason: Ventricles of the heart have thick walls.

Chapter 13: Reproduction in Plants

1. **Assertion:** Spore formation is a mode of asexual reproduction in some plants.
   Reason: Formation of spores occurs under unfavourable conditions.
2. **Assertion:** Bread mould reproduces asexually by spore formation.
   Reason: The green spongy material on a stale slice of bread is bread mould.
3. **Assertion:** Potato is an underground root tuber.
   Reason: Potato tuber has buds in the depressions called eyes.
4. **Assertion:** The male gametes in plants are called pollen grains.
   Reason: Pollen grains are formed inside the ovary of a plant.
5. **Assertion:** Transfer of pollen grains from the anthers to the stigma of pistil is called pollination.
   Reason: In sweet pea, pollination occurs by insects.

Chapter 14: Motion and Time

1. **Assertion:** Speed is the rate at which an object moves over a distance.
   Reason: A fast-moving object has a high speed.
2. **Assertion:** Average speed is the mean of all the speeds of a body in nonuniform motion.
   Reason: Average speed is calculated by dividing the total distance travelled by the total time taken.
3. **Assertion:** Indian Standard Time (IST) is the standard official time followed throughout India.
   Reason: The Standard Meridian of India passes between Allahabad and Varanasi.
4. **Assertion:** Sundial was one of the earlier means of measurement of time.
   Reason: A sundial uses the change in the position and size of the shadow formed by the sun to give time.
5. **Assertion:** A simple pendulum completes each to-and-fro motion in exactly the same time.
   Reason: The bob of a simple pendulum is a light and hollow sphere.

Chapter 15: Electric Current and Its Effects

1. **Assertion:** The flow of electric energy or electricity is called electric current.
   Reason: The electric current is measured in ampere.
2. **Assertion:** A combination of two or three cells is called a battery.
   Reason: A battery is a source of electric current.
3. **Assertion:** A fuse is a heating device used in the circuit to avoid overloading.
   Reason: When current in a circuit exceeds a specified value, the fuse wire melts and circuit is broken.
4. **Assertion:** The combined effect of electricity and magnetism is called electromagnetism.
   Reason: The electric current attracts magnetic things towards it.
5. **Assertion:** An electromagnet is a temporary magnet.
   Reason: The magnetism disappears as soon as the current through the coil of electromagnet is switched off.

Chapter 16: Light

1. **Assertion:** Light is reflected by smooth and shiny opaque surfaces.
   Reason: Light always travels along a straight line.
2. **Assertion:** The ray of light falling on a reflecting surface is called incident ray.
   Reason: Angle formed between the incident ray and the reflected ray is called angle of incidence.
3. **Assertion:** A virtual image is formed on the screen.
   Reason: The image formed in a plane mirror when we look into it is a virtual image.
4. **Assertion:** A curved mirror is also called a spherical mirror.
   Reason: It is because a curved mirror has been cut out of a sphere.
5. **Assertion:** A dentist's mirror is a concave mirror.
   Reason: A dentist uses a mirror to see an enlarged image of the tooth.

Chapter 17: Water

1. **Assertion:** Water on the earth is found in all the three states of matter.
   Reason: Solid form of water is ice and snow which is found on high mountains, glaciers and at poles.
2. **Assertion:** The continuous circulation of water between the atmosphere, land and oceans on the earth is called water cycle.
   Reason: Most of the rainwater seeps into the ground and collects as groundwater.
3. **Assertion:** Pond water is not fit for drinking.
   Reason: Pond water may contain germs and other soluble impurities which are harmful for the health.
4. **Assertion:** Pond water is an important source for agricultural and industrial needs.
   Reason: The seeped water collects between the layers of hard rocks and forms an aquifer.
5. **Assertion:** About 98% of the total water on the earth is present in seas and oceans.
   Reason: Only a very little amount of water available on the earth is fit for our use.

Chapter 18: Forest

1. **Assertion:** A forest contains annual, biennial and perennial plants.
   Reason: Herbs are perennial plants.
2. **Assertion:** Canopy is the topmost layer of a forest.
   Reason: Canopy appears as a green cover forming a roof over the forest land.

3. **Assertion:** An increase in the level of carbon dioxide may cause global warming.
   Reason: Plants purify air by releasing oxygen into atmosphere during the process of photosynthesis.
4. **Assertion:** Forests help in bringing rainfall.
   Reason: Forests keep the air cool by the evaporation of water from the leaves.
5. **Assertion:** A food chain always begins with producers.
   Reason: In a food web, several food chains are interlinked.

Chapter 19: Waste Water Story

1. **Assertion:** Water containing waste from various sources is called sewage.
   Reason: Consumption of waste water may cause diseases like typhoid, cholera, dysentery, etc.
2. **Assertion:** Sewage should be treated before discharging into rivers, ponds or lakes.
   Reason: Sewage contains lots of germs and impurities due to which many aquatic animals may die.
3. **Assertion:** The organic matter that floats at water surface in sedimentation tank is called sludge.
   Reason: The sludge is decomposed with the help of anaerobic bacteria in digesters.
4. **Assertion:** Chlorine is a common disinfectant used to purify water.
   Reason: Chlorine destroys organic matter like human and animal wastes present in waste water.
5. **Assertion:** Open defecation may lead to waterborne diseases like typhoid, hepatitis A, dysentery, cholera, diarrhoea, etc.
   Reason: A septic system uses natural processes to treat waste water.

ANSWERS

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

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

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

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

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

Chapter 6
1. (a) 2. (b) 3. (c) 4. (d) 5. (b)

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

Chapter 8
1. (b) 2. (d) 3. (c) 4. (b) 5. (a)

Chapter 9
1. (c) 2. (a) 3. (a) 4. (c) 5. (b)

Chapter 10
1. (b) 2. (d) 3. (c) 4. (c) 5. (b)

Chapter 11
1. (b) 2. (b) 3. (c) 4. (d) 5. (b)

Chapter 12
1. (b) 2. (a) 3. (a) 4. (c) 5. (d)

Chapter 13
1. (a) 2. (b) 3. (d) 4. (c) 5. (b)

Chapter 14
1. (b) 2. (a) 3. (b) 4. (a) 5. (c)

Chapter 15
1. (b) 2. (b) 3. (d) 4. (c) 5. (a)

Chapter 16
1. (b) 2. (c) 3. (d) 4. (a) 5. (b)

Chapter 17
1. (b) 2. (c) 3. (a) 4. (d) 5. (b)

Chapter 18
1. (c) 2. (b) 3. (c) 4. (a) 5. (b)

Chapter 19
1. (b) 2. (a) 3. (d) 4. (c) 5. (b)