MAHAVIR SENIOR MODEL SCHOOL
SUBJECT: SCIENCE
CLASS: VIII
COMPETENCY BASED QUESTIONS
MULTIPLE CHOICE QUESTIONS

1. If you increase the number of turns in the coil of an electromagnet, its strength will:
   (a) Decrease
   (b) Remain the same
   (c) Increase
   (d) Become zero

2. Why is a dry cell called "dry"?
   (a) It contains no wires
   (b) Its electrolyte is a moist paste
   (c) It produces dry heat
   (d) It uses dry metals

3. Which of the following best describes a circuit?
   (a) A closed loop for current to flow
   (b) An open switch
   (c) A fuse
   (d) A broken wire

4. Particles of matter are so small that they:
   (a) Can be seen with a magnifying glass
   (b) Can be seen with an ordinary microscope
   (c) Cannot be seen even through an ordinary microscope.
   (d) Are visible only when dissolved in water.

5. Interparticle forces decrease drastically when:
   (a) The distance between particles decreases
   (b) The distance between particles increases
   (c) The particles are grind into powder
   (d) The substance is a solid

6. When sugar dissolves in water, it shows:
   (a) Matter is destroyed
   (b) Particles are stationary
   (c) Matter is continuous
   (d) Matter is made up of particles

7. Which of the following has a variable composition?
   (a) Element
   (b) Compound
   (c) Mixture
   (d) Molecule

8. Lime water turns milky in the presence of which gas?
   (a) Oxygen
   (b) Nitrogen
   (c) Carbon dioxide
   (d) Hydrogen

9. What is an alloy?
   (a) A pure metal
   (b) A uniform mixture of two or more metals (or a metal and non-metal)
   (c) A non-uniform mixture of liquids
   (d) A compound formed by chemical reaction

10. The warning "Objects in mirror are closer than they appear" is found on:
   (a) Shaving mirrors
   (b) Side-view mirrors of vehicles
   (c) Dentist mirrors
   (d) Torch reflectors

11. What kind of image is always formed by a convex mirror?
   (a) Inverted and enlarged
   (b) Erect and diminished
   (c) Inverted and same size
   (d) Erect and enlarged

12. Lenses are different from mirrors because:
   (a) They reflect light
   (b) They allow light to pass through them (refract)
   (c) They are always opaque
   (d) They cannot form real images

13. Which organism occupies the first trophic level in a food chain?
   (a) Herbivores
   (b) Carnivores
   (c) Producers
   (d) Decomposers

14. In a pond ecosystem, which of the following is considered an abiotic component?
    (a) Algae
    (b) Dragonflies
    (c) Dissolved oxygen
    (d) Bacteria

15. Which of the following describes "Commensalism"?
    (a) Both organisms benefit from the interaction.
    (b) One organism benefits while the other is harmed.
    (c) One organism benefits while the other is unaffected.
    (d) Both organisms are harmed by the interaction.

MAHAVIR SENIOR MODEL SCHOOL
SUBJECT: SCIENCE
CLASS: VIII
COMPETENCY BASED QUESTIONS
ASSERTION REASON QUESTIONS

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is NOT the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

1. **Assertion (A):** A convex lens is called a converging lens.
   Reason (R): It makes the parallel beams of light passing through it come closer together.

2. **Assertion (A):** An image of the same size as the object is formed by a plane mirror.
   Reason (R): In spherical mirrors, the size of the image changes with the distance of the object.

3. **Assertion (A):** Lenses are used in cameras and microscopes.
   Reason (R): Lenses can focus or spread light to create images of distant or tiny objects.

4. **Assertion (A):** Dust particles are an integral part of air.
   Reason (R): The amount of dust in the air varies from place to place.

5. **Assertion (A):** Oxygen helps in combustion.
   Reason (R): Nitrogen constitutes the major part of the air and does not support combustion.

6. **Assertion (A):** Mishraloha refers to a mixture of metals with properties different from constituent metals.
   Reason (R): Ancient texts like Charaka Samhita mention the use of alloys for medicine.

7. **Assertion (A):** Solids have a definite shape.
   Reason (R): Interparticle attractions are very strong in solids, holding particles in fixed positions.

8. **Assertion (A):** Gases can spread and fill all available space.
   Reason (R): Interparticle spaces in gases are very large and attractions are very weak.

9. **Assertion (A):** We can see air inside a balloon with our naked eyes.
   Reason (R): Air is made up of particles that add weight to an inflated balloon.

10. **Assertion (A):** A compass needle deflects when current flows through a nearby wire.
    Reason (R): A current-carrying wire produces a magnetic field around it.

11. **Assertion (A)**: A battery that stops working should be thrown in regular garbage.
    Reason (R): Used batteries contain materials like lead and lithium which can be harmful to the environment.

12. **Assertion (A):** The heating element of an electric iron is made of nichrome wire.
    Reason (R): Nichrome has high resistance and produces a significant amount of heat when electric current passes through it.

13. **Assertion (A):** Decomposers play a vital role in maintaining the health of an ecosystem.
    Reason (R): They recycle nutrients by breaking down complex substances from dead plants and animals back into the soil.

14. **Assertion (A):** A community is composed of various populations sharing the same habitat.
    Reason (R): Biotic components include air, water, and sunlight.

15. **Assertion (A):** In a food web, one organism can be part of multiple food chains.
    Reason (R): A food chain is a simple linear sequence showing 'who eats whom'.

MAHAVIR SENIOR MODEL SCHOOL
SUBJECT: SCIENCE
CLASS: VIII
COMPETENCY BASED QUESTIONS
CASE BASED QUESTIONS AND DIAGRAMS

Read the passage and the answer the given questions.

CASE 1:

Suman's family recently moved into an old house. While using an electric kettle and a toaster simultaneously, the power in the kitchen suddenly went out. Suman's father checked the distribution board and found that a thin wire in a ceramic holder had melted. He explained that this was a "fuse" and it protected the house from a potential fire. Later that evening, Suman noticed that while the wire connecting the toaster to the plug stayed cool, the "element" inside the toaster glowed bright red and toasted the bread.

(a) Why does the heating element inside the toaster get red hot while the connecting cord remains cool, even though the same current flows through both?

(b) If Suman's father replaced the melted fuse wire with a thick copper power cable, would it still act as a safety device? Why or why not?

(c) In a circuit designed to test the heating effect, if you double the length of the wire while keeping the current the same, how would the heat produced change?

CASE 2:

In a history-meets-science project, students are studying the Iron Pillar of Delhi and ancient Indian metallurgy. They read that ancient blacksmiths used a variety of substances: pure iron (an element), charcoal (carbon), and bronze (an alloy of copper and tin). To protect the iron from rusting, modern scientists often study how iron reacts with oxygen and moisture to form iron oxide (rust). During a lab simulation, a student is given a container labeled "Sample X". It contains a fine grey powder and yellow grains. When a magnet is moved over the container, the grey powder sticks to the magnet, leaving the yellow grains behind. However, when the student takes another sample, "Sample Y" (a reddish-brown solid), and heats it intensely or uses a magnet, the components do not separate, and the magnet has no effect.

(a) Based on the observation with the magnet, classify Sample X and Sample Y as either a mixture or a compound. Justify your answer by explaining how the components retain or lose their individual properties.

(b) The text mentions Bronze (an alloy of copper and tin) and Poha (a mix of flattened rice, peanuts, and spices), both are mixtures. However, one is described as uniform (homogeneous) and the other as non-uniform (heterogeneous). Identify which is which and explain the visual difference between them at the particle level.

(c) Suppose the "yellow grains" in Sample X are Sulfur. If you were to chemically react the iron and sulfur together using heat to form Iron Sulfide, would you still be able to use a magnet to separate the iron? Why or why not? Relate your answer to the "fixed proportions" and "new properties" characteristics of a compound.

CASE 3 :

In a remote village, an engineer designs a "Solar Cooker" using a large, highly polished curved sheet of metal. She places a black pot at a specific point in front of the curved surface. On a sunny day, the temperature at that point becomes high enough to boil water in minutes. Meanwhile, her assistant tries to replicate this using a large convex mirror from a discarded truck side-view mirror, but the pot refuses to get hot.

(a) Identify the specific type of spherical mirror the engineer used for the successful solar cooker. Explain its property.

(b) Why did the assistant's attempt with the truck's side-view (convex) mirror fail? Describe the path of light rays after they hit a convex mirror to support your answer.

(c) If the engineer replaced the mirror with a large lens that is thicker in the middle than at the edges, would she still be able to boil water? Name the lens and explain its effect on sunlight.

Well labelled diagrams to be drawn for the following:

1. Draw a labelled diagram of a electromagnet. Your drawing should include an iron nail, a battery, a key, and a coil of insulated wire. Use arrows to show the path of the electric current.
2. Draw a convex lens and show parallel rays of light passing through it and meeting at the principal focus.