Step-by-Step Solutions & Marking Scheme

CBSE Class 8 Science (Curiosity) — Chapter 8: Nature of Matter: Elements, Compounds, and Mixtures

Quick answer key — Section A: 1-(c) 2-(b) 3-(c) 4-(d) 5-(b) 6-(a) 7-(A) 8-(C)

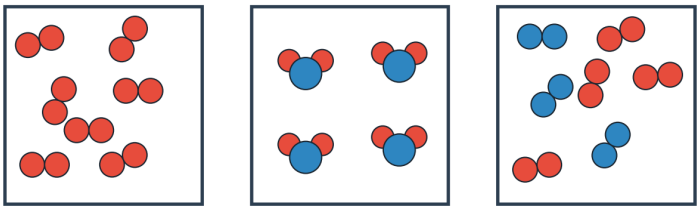
SECTION A — Multiple Choice Questions

1. (c) Water

Water is made of two elements, hydrogen and oxygen, combined chemically in a fixed ratio (2:1), so it is a compound. Oxygen and iron are elements; air is a mixture.

Marking: 1 mark.

2. Fig. 1 → **(b) Box Q**



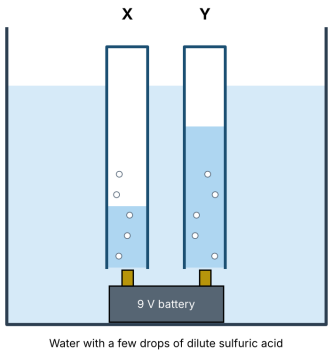
Step 1: Box P has particles of one kind only (two red atoms joined) → an element.

Step 2: Box Q has identical particles, each made of different atoms (one blue and two red) joined together → a compound.

Step 3: Box R has separate particles of two kinds mixed together → a mixture.

Marking: 1 mark.

3. Fig. 2 → **(c)**



Step 1: Water splits into hydrogen and oxygen in the ratio 2:1 by number of atoms, so the tube with twice the gas (X) holds hydrogen.

Step 2: Hydrogen burns with a pop sound; oxygen makes a burning candle glow brighter (tube Y).

Marking: 1 mark.

4. (d) Air

Air is a uniform mixture of gases. Muddy water, sprout salad, and oil and water show visibly separate components, so they are non-uniform.

Marking: 1 mark.

5. (b) copper and zinc

Brass is a mixture (alloy) of copper and zinc; bronze is copper and tin.

Marking: 1 mark.

6. (a)

The black mass is iron sulfide, a compound with properties different from iron and sulfur. It is not attracted by a magnet and cannot be separated into iron and sulfur by physical means.

Marking: 1 mark.

7. Assertion–Reason → **(A)**

Step 1: A is true: iron sulfide is not attracted by a magnet.

Step 2: R is true: heating forms a new substance with different properties.

Step 3: Because iron sulfide has different properties from iron, the magnet does not attract it → R explains A → (A).

Marking: 1 mark.

8. Assertion–Reason → **(C) A is true but R is false.**

Step 1: A is true: dust particles are suspended in air and are regarded as pollutants.

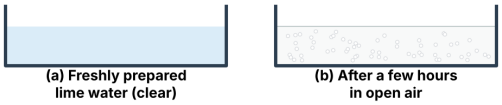
Step 2: R is false: dust is not an integral part of air, and its amount varies from time to time and place to place.

Step 3: A true, R false → (C).

Marking: 1 mark.

SECTION B — Short Answer Questions

9. Lime water (Fig. 3)

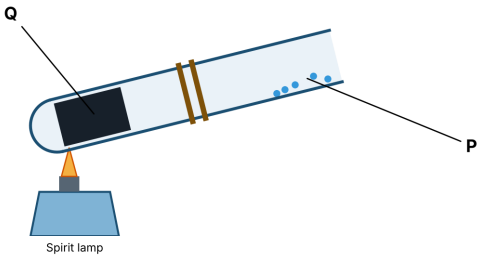


(a) Lime water reacts with the **carbon dioxide** present in air to form insoluble tiny white particles of calcium carbonate, which make it milky.

(b) Calcium hydroxide + carbon dioxide → calcium carbonate + water.

Marking: (a) 1; (b) 1.

10. Heating sugar (Fig. 4)



(a) Q is **carbon** (charcoal); P is **water**.

(b) Sugar breaks down into carbon and water (which is made of hydrogen and oxygen), so it is made of more than one element chemically combined: it is a **compound** (of carbon, hydrogen and oxygen).

Marking: 1 mark for each part.

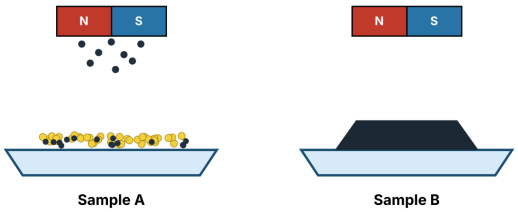
11. Classification

Gold – **element**; carbon dioxide – **compound**; brass – **mixture** (alloy of copper and zinc); sulfur – **element**.

Marking: ½ mark for each.

SECTION C — Long Answer Questions

12. Iron and sulfur (Fig. 5)



(i) Sample A. It contains iron filings, which keep their properties in a mixture and are attracted by the magnet.

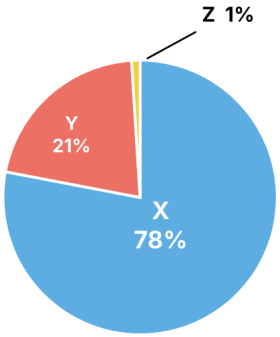
(ii) Sample B is **iron sulfide**, a **compound** (iron and sulfur combined chemically).

(iii) Hydrogen (iron + dilute hydrochloric acid → iron chloride + hydrogen). The gas is colourless and odourless and burns with a 'pop' sound near a flame.

(iv) Hydrogen sulfide, which has a rotten-egg smell.

Marking: 1 mark for each part.

13. Composition of air (Fig. 6)



(i) X is **nitrogen** (78%); Y is **oxygen** (21%).

(ii) Y (oxygen) supports combustion; nitrogen does not.

(iii) Argon, carbon dioxide and water vapour (any two).

(iv) Its gases are mixed evenly and cannot be seen separately, and they keep their own properties without reacting chemically, so air is a uniform mixture.

Marking: 1 mark for each part.

14. Mixture vs compound

(i) A mixture is formed by simply mixing substances; a compound is formed when elements combine chemically.

(ii) A mixture has no fixed composition; a compound has elements in a fixed ratio.

(iii) In a mixture the components keep their properties; a compound has properties different from its elements.

(iv) The components of a mixture can be separated by physical methods; those of a compound cannot.

Marking: 1 mark for each point.

15. Reasons

(i) It contains iron, nickel, chromium and a little carbon mixed uniformly; each retains its properties and there is no chemical reaction, so it is a mixture (an alloy).

(ii) In water the hydrogen and oxygen are so tightly combined that physical methods cannot separate them; it is a compound.

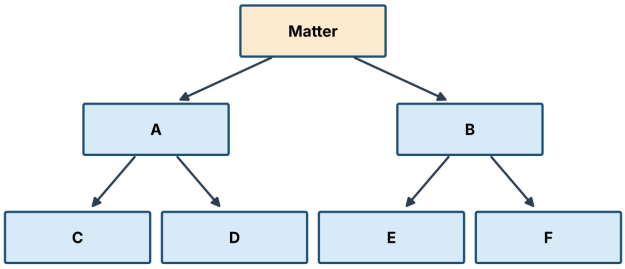
(iii) The salt is only dissolved (a mixture) in the solution, so evaporation separates it from water; sodium and chlorine are combined chemically in sodium chloride, a compound.

(iv) In science a pure substance has only one type of particle; milk contains several substances, so it is a mixture.

Marking: 1 mark for each part.

SECTION D — Case-Based / Practical Questions

16. Classification of matter (Fig. 7)



(i) A = **pure substances**; B = **mixtures**.

(ii) C = **elements**; D = **compounds**.

(iii) C: any element, e.g. iron, gold, oxygen. D: any compound, e.g. water, carbon dioxide, sugar.

(iv) E = **uniform mixtures**; F = **non-uniform mixtures**.

(v) (a) Seawater: **E**. (b) Muddy water: **F**.

Marking: 1 mark for each part.

17. Salt and sugar

(i) Uniform (the salt particles are evenly spread in water and cannot be seen separately).

(ii) Evaporation.

(iii) Carbon (charcoal).

(iv) Sugar gives carbon and water (hydrogen and oxygen), so it is made of more than one element: a **compound**.

(v) A **compound**: it is made of sodium and chlorine combined chemically in a 1:1 ratio.

Marking: 1 mark for each part.

Section	A	B	C	D	Total
Marks	8	6	16	10	40

Note: any other correct and relevant answer should be accepted and awarded full marks.