Short Answer Type Questions

1. Suggest separation technique(s) one would need to employ to separate the following mixtures.
   - (a) Mercury and water
   - (b) Potassium chloride and ammonium chloride
   - (c) Common salt, water and sand
   - (d) Kerosene oil, water and salt

2. Which of the tubes in Fig. 2.1 (a) and (b) will be more effective as a condenser in the distillation apparatus?

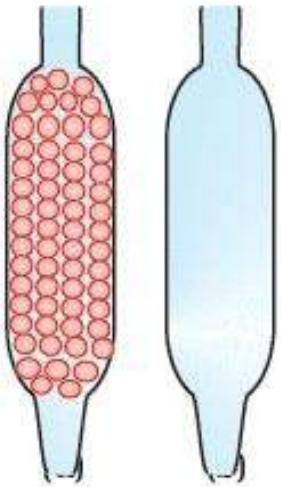

Fig. 2.1

3. Salt can be recovered from its solution by evaporation. Suggest some other technique for the same?
4. The 'sea-water' can be classified as a homogeneous as well as heterogeneous mixture. Comment.

5. While diluting a solution of salt in water, a student by mistake added acetone (boiling point 56°C). What technique can be employed to get back the acetone? Justify your choice.
6. What would you observe when
    - (a) a saturated solution of potassium chloride prepared at 60°C is allowed to cool to room temperature.
    - (b) an aqueous sugar solution is heated to dryness.
    - (c) a mixture of iron filings and sulphur powder is heated strongly.

7. Explain why particles of a colloidal solution do not settle down when left undisturbed, while in the case of a suspension they do.
8. Smoke and fog both are aerosols. In what way are they different?
9. Classify the following as physical or chemical properties
    - (a) The composition of a sample of steel is: 98% iron, 1.5% carbon and 0.5% other elements.
    - (b) Zinc dissolves in hydrochloric acid with the evolution of hydrogen gas.
    - (c) Metallic sodium is soft enough to be cut with a knife.
    - (d) Most metal oxides form alkalis on interacting with water.

10. The teacher instructed three students 'A', 'B' and 'C' respectively to prepare a 50% (mass by volume) solution of sodium hydroxide (NaOH). 'A' dissolved 50g of NaOH in 100 mL of water, 'B' dissolved 50g of NaOH in 100g of water while 'C' dissolved 50g of NaOH in water to make 100 mL of solution. Which one of them has made the desired solution and why?
11. Name the process associated with the following
    - (a) Dry ice is kept at room temperature and at one atmospheric pressure.
    - (b) A drop of ink placed on the surface of water contained in a glass spreads throughout the water.
    - (c) A potassium permanganate crystal is in a beaker and water is poured into the beaker with stirring.

- (d) A acetone bottle is left open and the bottle becomes empty.
- (e) Milk is churned to separate cream from it.
- (f) Settling of sand when a mixture of sand and water is left undisturbed for some time.
- (g) Fine beam of light entering through a small hole in a dark room, illuminates the particles in its paths.

12. You are given two samples of water labelled as 'A' and 'B'. Sample 'A' boils at 100°C and sample 'B' boils at 102°C. Which sample of water will not freeze at 0°C? Comment.
13. What are the favourable qualities given to gold when it is alloyed with copper or silver for the purpose of making ornaments?
14. An element is sonorous and highly ductile. Under which category would you classify this element? What other characteristics do you expect the element to possess?
15. Give an example each for the mixture having the following characteristics. Suggest a suitable method to separate the components of these mixtures
    - (a) A volatile and a non-volatile component.
    - (b) Two volatile components with appreciable difference in boiling points.
    - (c) Two immiscible liquids.
    - (d) One of the components changes directly from solid to gaseous state.
    - (e) Two or more coloured constituents soluble in some solvent.

16. Fill in the blanks
    - (a) A colloid is a _____ mixture and its components can be separated by the technique known as _____.
    - (b) Ice, water and water vapour look different and display different _____ properties but they are _____ the same.
    - (c) A mixture of chloroform and water taken in a separating funnel is mixed and left undisturbed for some time. The upper layer in the separating funnel will be of _____ and the lower layer will be that of _____ .
    - (d) A mixture of two or more miscible liquids, for which the difference in the boiling

points is less than 25 K can be separated by the process called _____ .

- (e) When light is passed through water containing a few drops of milk, it shows a bluish tinge. This is due to the _____ of light by milk and the phenomenon is called _____ . This indicates that milk is a _____ solution.

17. Sucrose (sugar) crystals obtained from sugarcane and beetroot are mixed together. Will it be a pure substance or a mixture? Give reasons for the same.
18. Give some examples of Tyndall effect observed in your surroundings?
19. Can we separate alcohol dissolved in water by using a separating funnel? If yes, then describe the procedure. If not, explain.
20. On heating calcium carbonate gets converted into calcium oxide and carbon dioxide.
    - (a) Is this a physical or a chemical change?
    - (b) Can you prepare one acidic and one basic solution by using the products formed in the above process? If so, write the chemical equation involved.

21. Non metals are usually poor conductors of heat and electricity. They are non-lustrous, non-sonorous, non-malleable and are coloured.
    - (a) Name a lustrous non-metal.
    - (b) Name a non-metal which exists as a liquid at room temperature.
    - (c) The allotropic form of a non-metal is a good conductor of electricity. Name the allotrope.
    - (d) Name a non-metal which is known to form the largest number of compounds.
    - (e) Name a non-metal other than carbon which shows allotropy.
    - (f) Name a non-metal which is required for combustion.

22. Classify the substances given in Fig. 2.2 into elements and compounds

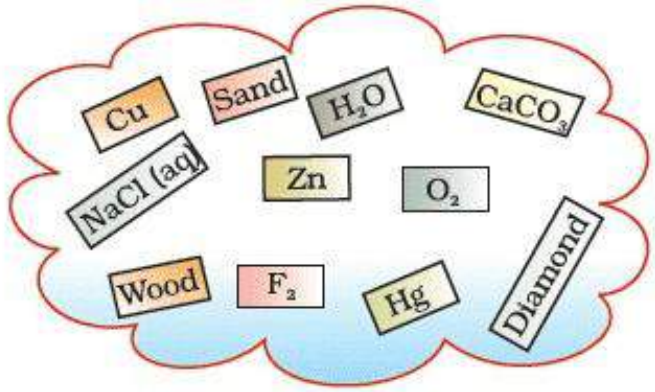

Fig. 2.2

23. Which of the following are not compounds?
    - (a) Chlorine gas
    - (b) Potassium chloride
    - (c) Iron
    - (d) Iron sulphide
    - (e) Aluminium
    - (f) Iodine
    - (g) Carbon
    - (h) Carbon monoxide
    - (i) Sulphur powder

Long Answer Type Questions

1. Fractional distillation is suitable for separation of miscible liquids with a boiling point difference of about 25 K or less. What part of fractional distillation apparatus makes it efficient and possess an advantage over a simple distillation process. Explain using a diagram.
2. (a) Under which category of mixtures will you classify alloys and why?
   (b) A solution is always a liquid. Comment.
   (c) Can a solution be heterogeneous?

3. Iron filings and sulphur were mixed together and divided into two parts, 'A' and 'B'. Part 'A' was heated strongly while Part 'B' was not heated. Dilute hydrochloric acid was added to both the Parts and evolution of gas was seen in both the cases. How will you identify the gases evolved?
4. A child wanted to separate the mixture of dyes constituting a sample of ink. He marked a line by the ink on the filter paper and placed the filter paper in a glass containing water as shown in Fig.2.3. The filter paper was removed when the water moved near the top of the filter paper.

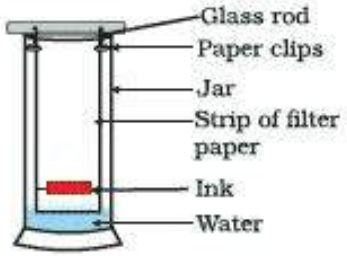

Fig. 2.3

- (i) What would you expect to see, if the ink contains three different coloured components?
- (ii) Name the technique used by the child.
- (iii) Suggest one more application of this technique.

5. A group of students took an old shoe box and covered it with a black paper from all sides. They fixed a source of light (a torch) at one end of the box by making a hole in it and made another hole on the other side to view the light. They placed a milk sample contained in a beaker/tumbler in the box as shown in the Fig.2.4. They were amazed to see that milk taken in the tumbler was illuminated. They tried the same activity by taking a salt solution but found that light simply passed through it?

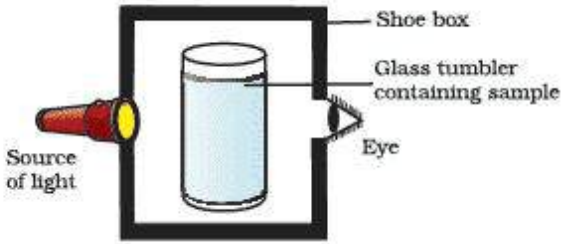

Fig. 2.4

- (a) Explain why the milk sample was illuminated. Name the phenomenon involved.
- (b) Same results were not observed with a salt solution. Explain.
- (c) Can you suggest two more solutions which would show the same effect as shown by the milk solution?

6. Classify each of the following, as a physical or a chemical change. Give reasons.
   - (a) Drying of a shirt in the sun.
   - (b) Rising of hot air over a radiator.
   - (c) Burning of kerosene in a lantern.
   - (d) Change in the colour of black tea on adding lemon juice to it.
   - (e) Churning of milk cream to get butter.

7. During an experiment the students were asked to prepare a 10% (Mass/Mass) solution of sugar in water. Ramesh dissolved 10g of sugar in 100g of water while Sarika prepared it by dissolving 10g of sugar in water to make 100g of the solution.
   - (a) Are the two solutions of the same concentration
   - (b) Compare the mass % of the two solutions.

8. You are provided with a mixture containing sand, iron filings, ammonium chloride and sodium chloride. Describe the procedures you would use to separate these constituents from the mixture?
9. Arun has prepared 0.01% (by mass) solution of sodium chloride in water. Which of the

following correctly represents the composition of the solutions?

- (a) 1.00 g of NaCl + 100g of water
- (b) 0.11g of NaCl + 100g of water
- (c) 0.0l g of NaCl + 99.99g of water
- (d) 0.10 g of NaCl + 99.90g of water

10. Calculate the mass of sodium sulphate required to prepare its 20% (mass percent) solution in 100g of water?