



परमाणु ऊर्जा शिक्षण संस्था  
Atomic Energy Education Society

उत्तर कुंजी / Answer Key (2025-26)

कक्षा/Class: VIII

शिष्य/Subject: Science

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**CHAPTER 9: THE AMAZING WORLD OF SOLUTES, SOLVENTS AND SOLUTIONS**

**I. Choose the correct answer:**

1. b) Water — solvent.
2. b) Powdered form — greater surface area dissolves faster.
3. a) Solvent.
4. d) Solvent is heated — increases rate of dissolving.
5. b) Liquid in gas — fog = tiny liquid droplets suspended in air.
6. a)  $\text{kg/m}^3$  — SI unit of density.
7. a) Decreases — solubility of gases in liquids decreases with increase in temperature.
8. a) 500 mL — 1 L - 500 mL = 500 mL more.

**II. Choose the correct answer from options given below for the statements.**

9. a)
10. a)
11. c)
12. a)

**III. Read the following passage and answer the question carefully.**

13. b) Filtration.
14. c) Evaporation
15. c) Heterogeneous mixture
16. c) It changes into vapor and escapes.

**IV. Short answer type questions -I**

17. Solutions are everywhere and essential for digestion, cleaning, cooking and medicines.  
Examples: (1) Sugar dissolved in tea — used for drinking  
(2) Saline (salt solution) used in medicines and first aid / intravenous fluids.
18. For most solids, solubility in water increases as temperature increases — i.e., more solid dissolves in hot water than in cold. Example: more sugar dissolves in hot water than in cold water.
19. Ice is less dense than liquid water because when water freezes its molecules form an open lattice (hydrogen bonding) that occupies more volume. Since ice has lower density, it floats.
20. Add more solute gradually until no more dissolves at that temperature (or evaporate some solvent)  
when no more solute dissolves the solution becomes saturated.
21. Mass is the amount of matter in an object (measured in kg or g) and is constant everywhere.  
Weight is the force due to gravity acting on a mass (measured in newtons, N) and equals  **$W = mg$** ; weight varies with gravity.
22. mass = 600 g, density =  $7.9 \text{ g/cm}^3$ .  
Volume = mass / density =  $600 \text{ g} \div 7.9 \text{ g/cm}^3 = 75.95 \text{ cm}^3$

## V. Short answer type questions- II

23. Heat the liquid mixture in a distillation flask. The component with the lower boiling point evaporates first; the vapour passes into a condenser where it cools and condenses to liquid (distillate) which is collected separately. Repeated heating/condensation separates components based on boiling points.

**Uses:** separating a liquid from a dissolved solid (e.g., salt water → water distillate) or separating two miscible liquids with different boiling points (fractional distillation).

24. **Materials:** two identical beakers with equal amounts of equal-temperature water, equal amounts of sugar, stopwatch, spoon.

**Procedure:** Add the same quantity of sugar to both beakers at the same time. Stir one beaker constantly while leaving the other unstirred. Time how long each takes for sugar to fully dissolve.

**Observation & conclusion:** The stirred beaker's sugar dissolves faster because stirring increases contact between solute and solvent (increases mixing and diffusion), increasing the rate of dissolution.

25. **Filtration:** Separates an insoluble solid from a liquid by passing through filter paper that retains the solid. *Example:* sand from water.

**Evaporation:** Remove the solvent by heating so that only the dissolved solid remains.

*Example:* obtaining salt crystals from salt solution by evaporating water.

**Decantation:** Carefully pouring off the liquid from a solid that has settled, leaving the solid behind. *Example:* after sand settles in water, pour off the clear water; used as rough separation before filtration.

26.

	Solution	Colloid	Suspension
<b>Particle size / appearance</b>	particles < 1 nm, homogeneous, cannot be seen.	particle size 1–1000 nm, appears homogeneous to naked eye but shows Tyndall effect.	large particles > 1000 nm, heterogeneous; particles visible and settle on standing.
<b>Tyndall effect / scattering</b>	No Tyndall effect	shows Tyndall effect.	may scatter light but particles settle; Tyndall often visible
<b>filtration</b>	particles do not settle and pass through filter paper.	particles do not settle and do not pass through ordinary filter paper (need ultrafiltration).	particles settle on standing and can be separated by filtration/decantation.
<b>Examples</b>	sugar in water	milk	muddy water.

