



Class 9 Science Chapter 5 – Important MCQs

Exploring Mixtures and their Separation

 **New NCERT *Exploration* | 2026–27**

These MCQs follow the **new Chapter 5** topics: homogeneous and heterogeneous mixtures, solutions, suspensions, colloids, concentration, solubility, crystallisation, distillation, paper chromatography, separating funnel, sublimation, centrifugation, coagulation and the Tyndall effect.



SECTION A – MIXTURES

1. A mixture in which the composition is uniform throughout is called:

- A. Heterogeneous mixture
- B. Homogeneous mixture
- C. Suspension
- D. Colloid

 **Answer: B. Homogeneous mixture**

2. Which is an example of a homogeneous mixture?

- A. Sand and water
- B. Oil and water
- C. Sugar and water
- D. Muddy water

 **Answer: C. Sugar and water**

3. A mixture of sand and water is:

- A. Homogeneous
- B. Heterogeneous
- C. A solution
- D. A pure substance

 **Answer: B. Heterogeneous**

4. Which of the following is a heterogeneous mixture?

- A. Salt solution
- B. Air
- C. Oil and water
- D. Sugar solution

 **Answer: C. Oil and water**

5. Which statement about a mixture is correct?

- A. Its components are always chemically combined.
- B. Its components retain their individual properties.
- C. It always has a fixed composition.
- D. It cannot be separated.

 **Answer: B. Its components retain their individual properties.**



SECTION B – SOLUTIONS

6. A solution is generally:

- A. Heterogeneous
- B. Homogeneous
- C. Always a suspension
- D. Always a colloid

 **Answer: B. Homogeneous**

7. The substance that dissolves another substance is called the:

- A. Solute
- B. Solvent
- C. Residue
- D. Dispersed phase

☒ **Answer: B. Solvent**

8. The substance that is dissolved in a solution is called the:

- A. Solvent
- B. Solute
- C. Medium
- D. Filtrate

☒ **Answer: B. Solute**

9. In a salt-water solution, water is the:

- A. Solute
- B. Solvent
- C. Residue
- D. Precipitate

☒ **Answer: B. Solvent**

10. In a sugar solution, sugar is the:

- A. Solvent
- B. Solute
- C. Filtrate
- D. Residue

☒ **Answer: B. Solute**

11. Which of the following is a true solution?

- A. Muddy water
- B. Salt dissolved in water
- C. Chalk powder in water
- D. Sand in water

✓ **Answer: B. Salt dissolved in water**

SECTION C – SUSPENSIONS & COLLOIDS

12. Which mixture contains particles that can be seen and may settle on standing?

- A. True solution
- B. Suspension
- C. Pure substance
- D. Homogeneous mixture

✓ **Answer: B. Suspension**

13. A suspension contains:

- A. Completely dissolved particles
- B. Undissolved particles dispersed in a medium
- C. No particles
- D. Only gas particles

✓ **Answer: B. Undissolved particles dispersed in a medium**

14. Which is an example of a suspension?

- A. Salt solution
- B. Sawdust in water
- C. Vinegar
- D. Sugar solution

✓ Answer: B. Sawdust in water

15. Which of the following is a colloid?

- A. Salt solution
- B. Milk
- C. Sugar solution
- D. Copper sulfate solution

✓ Answer: B. Milk

16. A colloid differs from a true solution because colloidal particles:

- A. Are always visible to the naked eye
- B. Can scatter light
- C. Always settle immediately
- D. Are completely absent

✓ Answer: B. Can scatter light

17. The scattering of light by dispersed particles is called:

- A. Doppler effect
- B. Tyndall effect
- C. Greenhouse effect
- D. Photoelectric effect

✓ Answer: B. Tyndall effect

18. Which mixture generally does NOT show the Tyndall effect?

- A. Colloid
- B. Suspension
- C. True solution
- D. Milk

✓ Answer: C. True solution

19. Which one generally settles down when left undisturbed?

- A. True solution
- B. Suspension
- C. Homogeneous solution
- D. Sugar solution

☒ **Answer: B. Suspension**



SECTION D – CONCENTRATION

20. Concentration of a solution describes:

- A. The colour of the solution
- B. The amount of solute present in a given amount of solution
- C. The temperature only
- D. The density of the container

☒ **Answer: B**

21. Mass by mass percentage is:

- A.
 $\text{Mass of solute} / \text{Mass of solution} \times 100$
- B.
 $\text{Mass of solution} / \text{Mass of solute} \times 100$
- C.
 $\text{Volume of solute} / \text{Volume of solution} \times 100$
- D.
 $\text{Mass of solvent} / \text{Mass of solution} \times 100$

☒ **Answer: A**

22. Mass by volume percentage is:

- A. Mass of solute / Volume of solution $\times 100$
- B. Volume of solute / Mass of solution $\times 100$
- C. Mass of solvent / Volume of solution $\times 100$
- D. Volume of solution / Mass of solute $\times 100$

✓ **Answer: A**

23. Volume by volume percentage is:

- A. Mass of solute / Mass of solution $\times 100$
- B. Volume of solute / Volume of solution $\times 100$
- C. Mass of solution / Volume of solute $\times 100$
- D. Volume of solvent / Mass of solution $\times 100$

✓ **Answer: B**

The new syllabus specifically requires calculation of concentration using **mass by mass, mass by volume and volume by volume percentages**.



SECTION E – SOLUBILITY

24. Solubility is generally the:

- A. Amount of solvent that evaporates
- B. Maximum amount of solute that can dissolve in a given amount of solvent under specified conditions
- C. Mass of the container
- D. Volume of the solution only

✓ **Answer: B**

25. For many solid substances, solubility generally:

- A. Decreases as temperature increases
- B. Increases as temperature increases

- C. Remains zero
- D. Is independent of temperature

✓ **Answer: B. Increases as temperature increases**

26. A solution containing the maximum amount of dissolved solute at a particular temperature is called:

- A. Dilute solution
- B. Saturated solution
- C. Suspension
- D. Colloid

✓ **Answer: B. Saturated solution**

27. Crystallisation is commonly used to obtain:

- A. A pure solid from a saturated solution
- B. A gas from a liquid
- C. Two immiscible liquids
- D. A suspension from a solution

✓ **Answer: A**

SECTION F – SEPARATION TECHNIQUES

28. Which method is most suitable for separating an insoluble solid from a liquid?

- A. Filtration
- B. Distillation
- C. Chromatography
- D. Sublimation

✓ **Answer: A. Filtration**

29. Which method is used to separate two immiscible liquids?

- A. Filtration
- B. Separating funnel
- C. Sublimation
- D. Crystallisation

 **Answer: B. Separating funnel**

30. A separating funnel separates liquids mainly on the basis of differences in:

- A. Colour
- B. Density
- C. Melting point
- D. Particle size

 **Answer: B. Density**

The textbook specifically states that a separating funnel is used for **immiscible liquids with different densities**.

31. Which technique is useful for separating pigments present in ink?

- A. Paper chromatography
- B. Separating funnel
- C. Filtration
- D. Centrifugation

 **Answer: A. Paper chromatography**

32. Paper chromatography separates substances mainly because they:

- A. Have different rates of movement on the paper
- B. Have identical densities
- C. Have identical solubilities
- D. Are all solids

✓ **Answer: A**

33. Which method is used to separate substances that differ in their boiling points?

- A. Distillation
- B. Filtration
- C. Sublimation
- D. Sedimentation

✓ **Answer: A. Distillation**

34. In simple distillation, the component with the lower boiling point generally:

- A. Evaporates more readily and is collected after condensation
- B. Never evaporates
- C. Always remains in the flask
- D. Becomes a solid first

✓ **Answer: A**

35. Distillation can be used to separate:

- A. Two miscible liquids with a suitable difference in boiling points
- B. Two identical liquids
- C. Two solids only
- D. Insoluble solids only

✓ **Answer: A**

The chapter specifies simple distillation for suitable miscible liquids and notes a minimum boiling-point difference of about **25°C** for the stated application.

36. Which technique is used when a solid changes directly into vapour?

- A. Condensation
- B. Sublimation
- C. Filtration
- D. Centrifugation

✓ **Answer: B. Sublimation**

37. The direct change of a solid into vapour without becoming liquid is called:

- A. Evaporation
- B. Sublimation
- C. Melting
- D. Boiling

✓ **Answer: B**

38. The conversion of vapour directly back into solid is called:

- A. Deposition
- B. Fusion
- C. Evaporation
- D. Condensation only

✓ **Answer: A. Deposition**

The chapter defines both **sublimation** and **deposition** explicitly.

SECTION G – CENTRIFUGATION & COAGULATION

39. Centrifugation separates components mainly by:

- A. Rapid spinning
- B. Heating

- C. Freezing
- D. Dissolving

✓ Answer: A. Rapid spinning

40. Centrifugation is particularly useful for separating:

- A. Heavier particles from a liquid
- B. Two gases
- C. Two miscible liquids
- D. Dissolved salt from water

✓ Answer: A

41. Which instrument/process can be used to separate cream from milk?

- A. Centrifugation
- B. Sublimation
- C. Chromatography
- D. Crystallisation

✓ Answer: A. Centrifugation

42. Coagulation involves:

- A. Making small particles clump together
- B. Dissolving all particles
- C. Converting solid into vapour
- D. Separating liquids by boiling point

✓ Answer: A

43. The substance added during coagulation to make particles clump together is called a:

- A. Solvent
- B. Coagulant

- C. Solute
- D. Filtrate

✓ Answer: B. Coagulant



SECTION H – APPLICATION-BASED MCQs

44. A mixture contains iron filings and sand. Which property can be used for separation?

- A. Magnetic property
- B. Boiling point
- C. Solubility in water
- D. Density only

✓ Answer: A. Magnetic property

45. A mixture contains salt and sand. Which sequence is most appropriate?

- A. Add water → filter → evaporate/crystallise
- B. Distil directly → filter
- C. Sublime both substances
- D. Use a separating funnel

✓ Answer: A

46. Why can filtration not separate dissolved salt from salt solution?

- A. Salt particles are too small and remain dissolved in the liquid.
- B. Salt is magnetic.
- C. Salt has a higher boiling point.
- D. Salt is an immiscible liquid.

✓ Answer: A

47. Which method would be most appropriate to obtain pure crystals of copper sulfate from its solution?

- A. Crystallisation
- B. Separating funnel
- C. Centrifugation
- D. Chromatography

✓ **Answer: A. Crystallisation**

48. Muddy water is left undisturbed. The mud settles at the bottom. This demonstrates:

- A. Sedimentation
- B. Sublimation
- C. Distillation
- D. Chromatography

✓ **Answer: A. Sedimentation**

49. Why does milk not behave like a true solution?

- A. It contains dispersed colloidal particles.
- B. It contains no particles.
- C. It is a pure substance.
- D. It is always a suspension with rapidly settling particles.

✓ **Answer: A**

50. A beam of light becomes visible when passed through milk. This is due to:

- A. Reflection
- B. Tyndall effect
- C. Refraction only
- D. Evaporation

✓ **Answer: B. Tyndall effect**

51. Which method would be most suitable for separating different colours present in black ink?

- A. Paper chromatography
- B. Filtration
- C. Separating funnel
- D. Centrifugation

 **Answer: A. Paper chromatography**

52. Which separation method is based on differences in density between immiscible liquids?

- A. Crystallisation
- B. Separating funnel
- C. Chromatography
- D. Sublimation

 **Answer: B**

53. Which separation method is based on differences in solubility?

- A. Crystallisation
- B. Centrifugation
- C. Separating funnel
- D. Filtration

 **Answer: A. Crystallisation**

54. Which of the following is incorrectly matched?

- A. Xylem — water transport
- B. Crystallisation — pure solid
- C. Chromatography — separation of pigments
- D. Separating funnel — immiscible liquids

 **Answer: A**

Why? Xylem belongs to plant tissues and is unrelated to separation of mixtures.

55. Which statement is correct?

- A. All mixtures can be separated by one single method.
- B. Separation depends on the physical properties of the components.
- C. Mixtures always undergo chemical reactions during separation.
- D. Homogeneous mixtures cannot be separated.

 **Answer: B**

The chapter emphasises using properties such as **size, density and solubility** to choose appropriate separation methods.



QUICK ANSWER KEY

Q	Ans.	Q	Ans.	Q	Ans.
1	B	20	B	39	A
2	C	21	A	40	A
3	B	22	A	41	A
4	C	23	B	42	A
5	B	24	B	43	B
6	B	25	B	44	A
7	B	26	B	45	A
8	B	27	A	46	A
9	B	28	A	47	A
10	B	29	B	48	A
11	B	30	B	49	A
12	B	31	A	50	B

13	B	32	A	51	A
14	B	33	A	52	B
15	B	34	A	53	A
16	B	35	A	54	A
17	B	36	B	55	B
18	C	37	B		
19	B	38	A		

MUST-REMEMBER FOR EXAMS

Mixtures

Homogeneous → uniform composition

Heterogeneous → non-uniform composition

Solution

Solute + Solvent = Solution

Suspension

Large particles → settle on standing

Colloid

Intermediate-sized dispersed particles → Tyndall effect

Tyndall Effect

Scattering of light by dispersed particles

Crystallisation

Saturated solution → pure solid crystals

Distillation

Separation based mainly on boiling-point differences

Chromatography

Separation based on different rates of movement

Separating Funnel

Two immiscible liquids → density difference

Sublimation

Solid → Vapour directly

Centrifugation

Rapid spinning → separation based on density

Coagulation

Small particles → clump together and settle

These separation techniques and their underlying physical principles are specifically part of the **2026–27 Chapter 5 learning outcomes**.