# 📘 DPP–4 : SOLUTIONS (Class 12 Chemistry – JAC Board)

◆ **SECTION–A : MCQs (20 × 1 = 20 marks)**

1. An ideal solution is one which
   (A) Obeys Henry's law
   (B) Obeys Raoult's law over entire range of composition
   (C) Shows positive deviation
   (D) Shows negative deviation

2. For an ideal solution, the enthalpy of mixing ($\Delta H_{mix}$) is
   (A) Positive
   (B) Negative
   (C) Zero
   (D) Very large

3. In ideal solutions, volume change on mixing ($\Delta V_{mix}$) is
   (A) Positive
   (B) Negative
   (C) Zero
   (D) Maximum

4. Which of the following is an ideal solution?
   (A) Benzene–Toluene
   (B) Ethanol–Water
   (C) Acetone–Chloroform
   (D) HCl–Water

5. Non-ideal solutions show
   (A) $\Delta H_{mix} = 0$
   (B) $\Delta V_{mix} = 0$
   (C) Deviation from Raoult's law
   (D) Complete miscibility

6. Positive deviation from Raoult's law occurs when
   (A) A–B interactions are stronger than A–A
   (B) A–B interactions are weaker than A–A
   (C) All interactions are equal
   (D) Hydrogen bonding increases

7. A solution showing positive deviation forms
   (A) Maximum boiling azeotrope
   (B) Minimum boiling azeotrope
   (C) No azeotrope
   (D) Ideal solution

8. Negative deviation from Raoult's law occurs when
   (A) A–B interactions are weaker
   (B) A–B interactions are stronger
   (C) $\Delta H_{mix} = 0$
   (D) $\Delta V_{mix} = 0$

9. A solution showing negative deviation forms
   (A) Minimum boiling azeotrope
   (B) Maximum boiling azeotrope
   (C) No azeotrope
   (D) Ideal solution

10. Azeotropes are mixtures which
    (A) Have variable boiling point
    (B) Have constant boiling point
    (C) Obey Raoult's law
    (D) Show no deviation

11. The word "azeotrope" means
    (A) Boiling at maximum temperature
    (B) Boiling at minimum temperature
    (C) Boiling without change in composition
    (D) Boiling of pure liquid

12. Minimum boiling azeotrope has boiling point
    (A) Higher than both components
    (B) Lower than both components
    (C) Equal to both components
    (D) Zero

13. Maximum boiling azeotrope has boiling point
    (A) Lower than both components
    (B) Higher than both components
    (C) Equal to both components
    (D) Constant at 100°C

14. Which of the following forms a minimum boiling azeotrope?
    (A) $HNO_3$–Water
    (B) HCl–Water
    (C) Ethanol–Water
    (D) Acetone–Chloroform

15. Which of the following forms a maximum boiling azeotrope?
    (A) Ethanol–Water
    (B) Benzene–Toluene
    (C) $HNO_3$–Water
    (D) n-Hexane–n-Heptane

16. Azeotropic mixtures
    (A) Can be separated by fractional distillation
    (B) Cannot be separated by fractional distillation
    (C) Can be separated by evaporation
    (D) Are pure liquids

17. Ethanol–water mixture shows
    (A) Negative deviation
    (B) Positive deviation
    (C) No deviation
    (D) Ideal behaviour

18. Acetone–chloroform mixture shows
    (A) Positive deviation
    (B) Negative deviation
    (C) Ideal behaviour
    (D) No deviation

19. Which condition is NOT true for ideal solutions?
    (A) $\Delta H_{mix} = 0$
    (B) $\Delta V_{mix} = 0$
    (C) Obeys Raoult's law
    (D) Forms azeotropes

20. In non-ideal solutions, vapour pressure is
    (A) Same as ideal
    (B) Greater or less than ideal
    (C) Always greater
    (D) Always zero

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◆ **SECTION–B : Short Answer Questions**

1. Define ideal solution. Write two characteristics.

2. What are non-ideal solutions?

3. What is positive deviation from Raoult's law?

4. Define azeotropes.

5. Can azeotropic mixtures be separated by fractional distillation? Give reason.

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◆ **SECTION–C : Long Answer Questions**

1. **Explain ideal and non-ideal solutions**. Give suitable examples.

2. **Explain azeotropes**. Distinguish between **minimum boiling** and **maximum boiling azeotropes** with examples.