

DPP-2: SOLUTIONS (Class 12 Chemistry – JAC Board)

◆ SECTION-A: MCQs ($20 \times 1 = 20$ marks)

- Molarity of a solution depends on
 - Pressure
 - Temperature
 - Nature of solute
 - Nature of solvent
- Molality of a solution is independent of
 - Temperature
 - Pressure
 - Nature of solute
 - Both (A) and (B)
- The unit of molarity is
 - mol kg^{-1}
 - mol L^{-1}
 - g L^{-1}
 - mol m^{-3}
- A molal solution contains one mole of solute in
 - 1 litre of solution
 - 1 litre of solvent
 - 1000 g of solvent
 - 22.4 litre of solution
- Mole fraction of a component is always
 - Greater than 1
 - Less than 1
 - Equal to 1
 - Zero
- Which concentration term is dimensionless?
 - Molarity
 - Molality
 - Normality
 - Mole fraction
- The relation between normality (N) and molarity (M) is
 - $N = M / n$
 - $N = nM$
 - $N = M + n$
 - $N = M - n$
- The normality of 0.2 M aqueous solution of a dibasic acid is
 - 0.1 N
 - 0.2 N
 - 0.4 N
 - 0.8 N

9. The molarity of a solution containing 5 g NaOH in 500 mL solution is
(A) 0.025 M
(B) 0.25 M
(C) 1.0 M
(D) 2.5 M
10. Which of the following is temperature independent?
(A) Molarity
(B) Normality
(C) Molality
(D) Volume strength
11. Mole fraction of solute increases when
(A) Solvent is added
(B) Solute is added
(C) Temperature increases
(D) Pressure increases
12. Molarity of pure water at 25°C is approximately
(A) 1 M
(B) 18 M
(C) 55.5 M
(D) 1000 M
13. If molarity of a solution is zero, then the solution is
(A) Concentrated
(B) Dilute
(C) Pure solvent
(D) Saturated
14. The unit of normality is
(A) mol L^{-1}
(B) eq L^{-1}
(C) g L^{-1}
(D) mol kg^{-1}
15. Equivalent mass of NaOH is
(A) 40
(B) 20
(C) 23
(D) 58.5
16. The sum of mole fractions of all components in a solution is
(A) Zero
(B) One
(C) Less than one
(D) Greater than one
17. If the volume of solution increases with temperature, molarity will
(A) Increase
(B) Decrease
(C) Remain same
(D) Become zero

18. Which concentration term is best for comparing solutions at different temperatures?

- (A) Molarity
- (B) Normality
- (C) Molality
- (D) Mole fraction

19. Concentration expressed as ppm is generally used when

- (A) Solution is very concentrated
- (B) Solute amount is very small
- (C) Solvent amount is very small
- (D) Temperature is high

20. Which of the following is NOT affected by temperature?

- (A) Molarity
- (B) Molality
- (C) Normality
- (D) Volume strength

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

1. Define molarity. Write its unit.
2. Define molality. Why is it temperature independent?
3. Distinguish between molarity and molality (any two points).
4. Write the relation between molarity and normality.
5. What is mole fraction? Why is it dimensionless?

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

1. Calculate the molality of a solution formed by dissolving 58.5 g of NaCl in 200 g of water.
2. Find the volume (in mL) of 0.1 M HCl required to completely neutralise 1 g mixture of Na_2CO_3 and NaHCO_3 containing equal number of moles of each.