ASSIGNMENT- CHEM. (A.K. SINHA)

Section-II Assertion-Reason Type Questions

The questions given below consist of two statements each printed as **'Assertion' (A)** and **'Reason' (R)**. While answering these questions you are required to choose any one of the following four options:

(a) If both (A) and (R) are correct and (R) is the correct explanation for (A).

(b) If both (A) and (R) are correct but (R) is not the correct explanation for (A).

(c) If (A) is correct but (R) is incorrect.

(d) If (A) is incorrect but (R) is correct.

(e) If both (A) and (R) are incorrect.

1. (A) The dissolution of gases in water is always an endothermic process.
   (R) Dissolution of gases in water proceed with negative value of ΔS.

2. (A) Water boiling at 100°C at 1 atmospheric pressure in a beaker is not at equilibrium.
   (R) It refers to an open system.

3. (A) A solution which contains one gram equivalent of solute per litre of the solution is called a normal solution.
   (R) A normal solution means a solution in which the solute does not associate or dissociate.

4. (A) The sum of mole fractions of all the components of a solution is unity.
   (R) Mole fraction is a temperature dependent quantity.

5. (A) Iodine is more soluble in CCl_4 than in water.
   (R) Non-polar solutes are more soluble in non-polar solvents.

6. (A) Vapour pressure of 0.5 M sugar solution is more than 0.5 M KCl solution.
   (R) Lowering of vapour pressure is directly proportional to the number of species present in the solution.

7. (A) Non-ideal solutions form azeotropic mixture.
   (R) Boiling point of azeotropic mixture is higher than boiling points of its both components.

8. (A) One molar solution is always more concentrated than one molal solution.
   (R) The amount of solvent in 1 M and 1 *m* aqueous solution is not equal.

9. (A) Camphor is used as solvent in the determination of molecular mass of naphthalene and anthracene etc.
   (R) Camphor has high molal elevation constant.

10. (A) 0.1 M solution of glucose has same increment in freezing point than 0.1 M solution of urea.
    (R) K_f for both has different values. **(AIIMS 1997)**

11. (A) Molarity of 0.02 N solution of HNO_3 is 0.02 M.
    (R) Molarity and normality of a solution are never equal.

12. (A) Larger the value of cryoscopic constant of the solvent, lesser will be the freezing point of the solution.
    (R) Depression in the freezing point depends on the nature of the solvent.

13. (A) 0.1 M solution of NaCl has greater osmotic pressure than 0.1 M solution of glucose at same temperature.
    (R) In solution, NaCl dissociates to produce more number of particles.

14. (A) Henry's law and Raoult's law are not independent, *i.e.*, one can be derived from the other.
    (R) The partial pressure is directly proportional to the mole fraction of the concerned species for ideal solutions.

15. (A) The water pouch of instant cold pack for treating athletic injuries breaks when squeezed and NH_4NO_3 dissolves thus lowering the temperature.
    (R) Addition of non-volatile solute into solvent results into depression of freezing point of solvent. **(AIIMS 2006)**

16. (A) In a pressure cooker, the water is brought to boil. The cooker is then removed from the stove. Now on removing the lid of pressure cooker, the water starts boiling again.
    (R) The impurities in water bring down its boiling point.
    [**Hint:** In pressure cooker, water boils above 100° C. When the lid of cooker is opened, pressure is lowered so that boiling point decreases and water boils again.]

17. (A) An increase in surface area increases the rate of evaporation.
    (R) Stronger the inter-molecular attractive forces, faster is the rate of evaporation at a given temperature.

18. (A) An ideal solution obeys Raoult's law.
    (R) In an ideal solution, solute-solute as well as solvent-solvent interactions are similar to solute-solvent interaction.

19. (A) When NaCl is added to water, a depression in freezing point is observed.
    (R) The lowering of vapour pressure of a solution causes depression in the freezing point.

20. (A) When methyl alcohol is added to water, boiling point of water increases.
    (R) When a volatile solute is added to a volatile solvent, elevation in boiling point is observed.

ANSWERS

1. (d)	2. (a)	3. (c)	4. (c)	5. (a)	6. (a)	7. (c)	8. (d)	9. (a)	10. (c)
					16. (c)	17. (c)	18. (a)	19. (a)	20. (a)