G.N. NATIONAL PUBLIC SCHOOL

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Assignment Sheet : Solution

Assertion - Reason Type Question

Each question contains STATEMENT-1 (Assertion) and STATEMENT-2 (Reason).

Examine the statement carefully and mark the correct answer according to the instructions given below:

(A) If both the statements are TRUE and STATEMENT-2 is the correct explanation of STATEMENT-1

(B) If both the statements are TRUE but STATEMENT-2 is NOT the correct explanation of STATEMENT-1

(C) If STATEMENT-1 is TRUE and STATEMENT-2 is FALSE

(D) If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

1. **STATEMENT-1 :** An increase in surface area increases the rate of evaporation.
   STATEMENT-2 : Stronger the inter-molecular attraction forces, faster is the rate of evaporation at a given temperature.
2. **STATEMENT-1 :** An ideal solution obeys Raoult's law.
   STATEMENT-2 : In an ideal solution, solute-solute as well as solvent-solvent, interactions are similar to solute-solvent interactions.
3. **STATEMENT-1 :** If a liquid solute more volatile than the solvent is added to the solvent, the vapour pressure of the solution is greater than vapour pressure of pure solvent.
   STATEMENT-2 : Vapour pressure of solution is equal to vapour pressure of solvent.
4. **STATEMENT-1 :** ΔV_{mix} and ΔS_{mix} for an ideal solution is zero.
   STATEMENT-2 : $A...B$ interaction in an ideal solution are same as between $A...A$ and $B...B$.
5. **STATEMENT-1 :** Elevation in boiling point will be high if the molal elevation constant of the liquid is high.
   STATEMENT-2 : Elevation in boiling point is a colligative property.
6. **STATEMENT-1 :** The boiling point of 0.1 M urea solution is less than that of 0.1 M KCl solution.
   STATEMENT-2 : Elevation of boiling point is directly proportional to the number of moles of non-volatile solute particles present in the solution.
7. **STATEMENT-1 :** The observed molar mass of acetic acid in benzene is more than the normal molar mass of acetic acid.
   STATEMENT-2 : Molecules of acetic acid dimerise in benzene due to hydrogen bonding.
8. **STATEMENT-1 :** Addition of ethylene glycol to water lowers the freezing point of water, therefore, used as antifreeze substance.
   STATEMENT-2 : Ethylene glycol is soluble in water.
9. **STATEMENT-1 :** Osmotic pressure is a colligative property.
   STATEMENT-2 : Osmotic pressure developed in a column due to osmosis.
10. **STATEMENT-1 :** Osmosis involves movement of solvent molecules from its lower concentration to its higher concentration.
    STATEMENT-2 : Solutions having the same osmotic pressure are called isotonic solutions.

11. **STATEMENT-1 :** Isotonic solutions must have the same molar concentration.
STATEMENT-2 : Solutions which have the same osmotic pressure are known as isotonic solution.

12. **STATEMENT-1 :** Isotonic solutions do not show phenomenon of osmosis.
STATEMENT-2 : Isotonic solutions have same molar concentration at same temperature.

13. **STATEMENT-1 :** When dried fruits and vegetables are placed in water, they slowly get swelled.
STATEMENT-2 : It happens due to the phenomenon of osmosis.

14. **STATEMENT-1 :** Reverse osmosis is used to purify sea water.
STATEMENT-2 : Solvent molecules pass from concentrate solution to pure solvent through semipermeable membrane if high pressure ($> \pi$) is applied on solution side.

15. **STATEMENT-1 :** All solutes becomes more soluble in water at higher temperature.
STATEMENT-2 : Solubility of solute depends upon temperature.

16. **STATEMENT-1 :** Henry's law is always applicable for gases.
STATEMENT-2 : Raoult's law is a special case of Henry's law.

17. **STATEMENT-1 :** Increasing pressure on pure water decrease its freezing point.
STATEMENT-2 : Density of water is maximum at 273 K.

18. **STATEMENT-1 :** The molecular weight of acetic acid determined by depression in freezing point method in benzene and water was found to be different.
STATEMENT-2 : Water is polar and benzene is non-polar.

19. **STATEMENT-1 :** If red blood cells were removed from the body and placed in pure water, pressure inside the cell increases.
STATEMENT-2 : The concentration of the salt content in the cells increases.

20. **STATEMENT-1 :** Azeotrope is a binary mixture formed by ideal solutions.
STATEMENT-2 : Azeotrope boils with unchanged composition.