

Assertion and Reason Questions
Class XII Chemistry
Chapter: Solutions

Q.No	Directions: These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses. (a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion. (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion. (c) If the Assertion is correct but Reason is incorrect. (d) If both the Assertion and Reason are incorrect.	option
1	Assertion: Molarity of a solution in liquid state changes with temperature. Reason: The volume of a solution changes with change in temperature.	a
2	Assertion: If a liquid solute more volatile than the solvent is added to the solvent, the vapour pressure of the solution may increase i.e., $p_s > p_0$. Reason : In the presence of a more volatile liquid solute, only the solute will form the vapours and solvent will not.	c
3	Assertion: If one component of a solution obeys Raoult's law over a certain range of composition, the other component will not obey Henry's law in that range. Reason: Raoul's law is a special case of Henry's law.	b
4	Assertion: Azeotropic mixtures are formed only by non-ideal solutions and they may have boiling points either greater than both the components or less than both the components. Reason: The composition of the vapour phase is same as that of the liquid phase of an azeotropic mixture.	b
5	Assertion : When methyl alcohol is added to water, boiling point of water increases. Reason : When a volatile solute is added to a volatile solvent elevation in boiling point is observed.	d
6	Assertion : When NaCl is added to water a depression in freezing point is observed. Reason : The lowering of vapour pressure of a solution causes depression in the freezing point.	a
7	Assertion: When a solution is separated from the pure solvent by a semi-permeable membrane, the solvent molecules pass through it from pure solvent side to the solution side Reason: Diffusion of solvent occurs from a region of high concentration solution to a region of low concentration solution.	b
8	Assertion: Non-Ideal solutions always form azeotropes. Reason: Boiling point of an Azeotrope may be higher or lower than boiling points of both components	d
9	Assertion: Lowering of vapour pressure is directly proportional to osmotic pressure of the solution. Reason: Osmotic pressure is a colligative properties.	b
10	Assertion: Elevation in boiling point is a colligative property. Reason: Elevation in boiling point is directly proportional to molarity.	c
11	Assertion: Osmotic pressure is a colligative properties. Reason. Osmotic pressure of a solution depends on the molar concentration of solute at any temperature T	a
12	Assertion: The Solubility of a gas decreases with increase in temperature Reason: Dissolution of gas in a liquid is an endothermic process.	c
13	Assertion: Iodine is more soluble in carbon tetrachloride than in water. Reason: Non-polar solutes are more soluble in Non-polar solvents.	a

14	Assertion: The sum of mole fractions of all the component of a solution is unity. Reason: The mole fraction is a temperature-dependent quantity.	c
15	Assertion: When scuba divers come towards surface, their capillaries get blocked which is painful and dangerous to life Reason: There occurred release of dissolved gases, as the pressure decreases and leads to the formation of bubbles of nitrogen in the blood.	a
16	Assertion: People taking a lot of salty food experience the puffiness or swelling, called edema Reason: There is water retention in tissue cells and intercellular spaces because of osmosis.	a
17	Assertion: 1 M solution of KCl has greater osmotic pressure than 1 M solution of glucose at the same temperature. Reason: In solution, KCl dissociates to produce more number of particles.	a
18	Assertion: Isotonic solution does not show net osmosis. Reason: Isotonic solutions have same osmotic pressure.	b
19	Assertion: Molecular mass of polymers cannot be calculated using boiling point or freezing point method. Reason: Polymer solution do not possess a constant boiling point or freezing point.	c
20	Assertion: Nitric acid and water form maximum boiling azeotrope. Reason: Azeotropes are binary mixture shaving the same composition in liquid and vapor phase.	b
21	Assertion: Non-Ideal solutions form azeotropes Reason: Maximum boiling azeotropes are formed by a solution showing negative deviation.	b
22	Assertion: Aquatic species are more comfortable in cold water than in warm water. Reason: Different gases have different K_H values at the same temperature.	b
23	Assertion: Aquatic species are more comfortable in cold water than in warm water. Reason: Different gases have different K_H values at the same temperature.	b
24	Assertion: An Ideal solution obeys Henry's law. Reason: In an ideal solution, solute-solute as well as solvent-solvent interactions are similar to solute-solvent interaction.	d
25	Assertion: A mixture of chloroform and acetone forms a solution with negative deviation from Raoult's Law. Reason: Escaping tendency of molecules for each components decreases due to hydrogen bonding between both molecules consequently vapor pressure decreases.	a

Answer

1	2	3	4	5	6	7	8	9	10
A	C	B	B	D	A	B	D	B	C
11	12	13	14	15	16	17	18	19	20
A	C	A	C	A	A	A	B	C	B
21	22	23	24	25					
B	B	B	D	A					