EXER	RCISE-I (Conceptual	Questions)	B	uild Up Your Understanding
		CONCENTRA	TION TERMS	
1.	8 g NaOH is dissolve (1) 0.8 M	ed in one litre of solution (2) 0.4 M	on, its molarity is: (3) 0.2 M	(4) 0.1 M
2.	If 18 g of glucose is p (1) 1 molar	present in 1000 g of so (2) 0.1 molar	lvent, the solution is s (3) 0.5 molar	aid to be : (4) 0.1 molar
3.	The molarity of a so sodium chloride in 50	lution of sodium chlor 00 mL of solution is :-	ride (mol wt. = 58.5)	in water containing 5.85 g of $(4) 0.2$
	(1) 0.25	(2) 2.0	(3) 1.0	(4) 0.2
4.	For preparing 0.1 M (1) 0.98 g	solution of H ₂ SO ₄ in o (2) 4.9 g	ne litre, we need H_2SG (3) 49.0 g	O ₄ : (4) 9.8 g
5.	Mole fraction of glyc (1) 0.46	erine (C ₃ H ₅ (OH) ₃ in a (2) 0.36	solution of 36 g of wa (3) 0.20	ater and 46 g of glycerine is : (4) 0.40
6.	1000 g aqueous solu solution is:	tion of CaCO ₃ contai	ns 10 <mark>g of calcium</mark> c	arbonate, concentration of the
	(1) 10 ppm	(2) 100 ppm	(3) 1000 ppm	(4) 10,000 ppm
7.	What is the normality	v of · 1M H₃PO₄ solutio	on ?	
	(1) 0.5 N	(2) 1.0 N	(3) 2.0 N	(4) 3.0 N
8.	The molarity of 0.2 N	NNa_2CO_3 solution will	be:	
	(1) 0.05 M	(2) 0.2 M	(3) 0.1 M	(4) 0.4 M
9.	Normality of 0.3 M p	bhosphorous acid is:		
10	(1) 0.15 The molarity of pur	(2) 0.6	(3) 0.9	(4) 0.1
10.	(1)100 M	(2) 55.5 M	(3) 50 M	(4) 18M
11.	Molarity of 720 g of	pure water		
	(1) 40 M	(2) 4 M	(3) 55.5 M	(4) Can't be determined
12.	Equal, weight of Na molarity of the two set (1) Equal (2) That of NaCl will (3) That of NaCl will	aCl and KCl are disso olutions will be- be less than that of KC be more than that of F	olved separately in eq Cl KCl Solution	ual volumes of solutions then
	(4) That of NaCl will	be half of that of KCl	solution	

13. The mole fraction of oxygen in a mixture of 7g of nitrogen and 8g of oxygen is : $\frac{8}{100}$

(1) $\frac{6}{15}$ (2) 0.5 (3) 0.25 (4) 1	(1) $\frac{8}{15}$	(2) 0.5	(3) 0.25	(4) 1.
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14.	In a solution of 7.8 benzene is :-	g benzene (C ₆ H ₆) ar	nd 46.0 g toluene (C_6	H_5CH_3) the mole fraction of
	(1) $\frac{1}{6}$	(2) $\frac{1}{5}$	(3) $\frac{1}{2}$	(4) $\frac{1}{3}$
15.	An X molal solution value of X is:-	of a compound in be	nzene has .mole fractio	on of solute equal to 0.2. The
	(1)14	(2) 3.2	(3) 1.4	(4) 2
16.	Mole fraction of eth ethanol by weight of	anol in ethanol water mixture is :-	mixture is 0.25. Hence	e percentage concentration of
	(1) 25%	(2) 75%	(3) 46%	(4) 54%
17.	A 500 g tooth paste fluorine in terms of p	e sample has 0.02 g fl opm level:-	uoride concentration.	What is the concentration of
	(1) 250	(2) 40	(3) 400	(4) 1000
18.	The normality gf 10 (1) 1.79	mL of a '20 V' H ₂ O ₂ so (2) 3.58	olution is (3) 60.86	(4) 6.086
19.	H ₂ O ₂ solution used 100mL of the soluti approximately :-	for hair bleaching is s on. The molecular ma	sold as a solution of a ass of H ₂ O ₂ is 34. Th	pproximately 5.0 g H_2O_2 per e molarity of this solution is
	(1) 0.15 M	(2) 1.5 M	(3) 3.0 M	(4) 3.4 M
20.	Normality of 10% (w (1) 0.1	V/V) H ₂ SO ₄ solution is (2) 0. 2	s nearly (3) 0.5	(4) 2
21.	What volume of 0.1 (1) 1 litre	N HNO ₃ solution can b (2) 2 litre	be prepared from 6.3 g (3) 0.5 litre	of HNO ₃ ? (4) 5 litre
22.	A molal solution is o (1) 1000 g of the solution $(1) = 1000$ g of the solution	ne that contains one m	ole of a solute in (2) one litre of the so	lution
	(3) one litre of the so	lvent	(4) 22.4litres of the se	olution
23.	Which of the followi (a) Molarity is the no (b) The molarity and (c) Molality (m) of a of solution (d) The ratio of mole (1) a & c	ng statement is true :- o. of moles of solute dis normality of a solution solution is defined as fraction of solute and (2) a & d	ssolved per litre of solv n of sodium carbonate the number of moles of solvent is in the ratio of (3) b & c	vent. are same. of solute dissolved is 1000 gm of there respective moles: (4) Only d
24.	Two bottles of A and respectively-	B contains 1M and 1	m aqueous solution (d	$\propto 1 \text{ gmL}^{-1}$) of sulphuric acid

(1) A is more concentrated than B

	 (2) B is more concentrated than A (3) Concentration of A = concentration of E (4) It is not possible to compare the concentration 	3 tration	
25.	Molar concentration of a solution in water i (1) Always equal to normality (3) Equal to molality of the solution	s: (2) More than molali (4) Less than the mol	ty of the solution ality of the solution
26.	The molarity of 98% H_2SO_4 (d = 1.8 g mL ⁻ (1) 6 M (2) 18 M	¹) by wt. is (3) 10 M	(4) 4 M
	SOLUBILITY (I	HENERY'S LAW)	
27.	Henry's law constant for dissolution of Cl solubility of CH_4 in benzene at 298 K under (1) 1.2×10^{-5} (2) 3.8×10^{-3}	H ₄ in benzene at 298 r 7 60 mm of Hg is : (3) 4×10^{-7}	K is 2×10^5 mm of Hg. Then (4) 1×10^{-2}
28.	Which of the following gas does not obey H (1) NH ₃ (2) H ₂	Henrys's law? (3) O ₂	(4) He
	VAPOUR PRESSURE (LI	OUID-LIOUID MIX	TURE)
29.	1 mol of heptane (V.P. = 92 mm of Hg) wa The vapour pressure of resulting ideal solut (1) 46.2 mm of Hg (3) 43.2 mm of Hg	s mixed with 4 mol of ion is : (2) 40.0 mm of Hg (4) 38.4 mm of Hg	octane (V.P. = 31mm of Hg).
30.	At 88°C benzene has a vapour pressure of torr. What is the mole fraction of benzene i atm. pressure, benzene – toluene form an id $(1) 0.416$ (2) 0.588	900 torr and toluene n the mixture with tolu eal solution : (3) 0.688	has a vapour pressure of 360 nene that will boil at 88°C at 1 (4) 0. 740
31.	If P_A^0 and P_B^0 are 108 and 36 torr respective phase if B has mole fraction in solution 0.5. (1) 0.25 (3) 0.60	ely. What will be the (2) 0.75 (4) 0.35	mole fraction of A is vapour
32.	What is correct relation between mole fraction in solution of A is (X_A) (If PF	ction in vapour phase R is vapour pressure of	(Y_A) of A in terms of X_A . If A in pure state)
	(1) $(1 - X_A) P_A^0$	(2) $\frac{X_A}{1 - X_A} P_A^0$	
	$(3) \frac{1-X_A}{X_A} P_A^0$	$(4) \ \frac{P_A^0 X_A}{P_S}$	
	IDEAL AND NON-	IDEAL SOLUTIONS	
33.	Which condition is not satisfied by an ideal	solution	
	(1) $\Delta H \text{ mixing} = 0$	(2) $\Delta V \text{ mixing} = 0$	
	(3) ΔS mixing = 0	(4) Obeyance of Rao	ult's law

34. Among the following, that does not form an ideal solution is :

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(1) C_6H_6 and $C_6H_5CH_3$ (3) C_6H_5Cl and C_6H_5Br

(2) C_2H_5Cl and C_6H_5OH (4) C_2H_5Br and C_2H_5I

- 35. An azeotropic mixture of two liquids has b.p. lower than either of them when it:-
 - (1) shows a (+ve) deviation from Raoult's law
 - (2) shows no deviation from Raoult's law
 - (3) shows (+ve) deviation from Henry's law
 - (4) shows (-ve) deviation from Henry's law

COLLIGATIVE PROPERTIES

- **36.** Which is not a colligative property ?
 - (1) Osmotic pressure

- (2) Relative lowering in vapour pressure
- (3) Depression in freezing point
- (4) Refractive index
- **37.** The lowering of vapour pressure of a solvent by addition of a non-volatile solute to it is directly proportionalto:
 - (1) The strength of the solution
 - (2) The nature of the solute in the solution
 - (3) The atmospheric pressure
 - (4) All
- **38.** The relative lowering of vapour pressure is equal to the mole fraction of the nonvolatile solute, This statement was given by :

(1) Raoult		(2) Henry
(3) Joule		(4) Dalton

- **39.** Which one of the following is the incorrect form of Raoult's law
 - (1) $\frac{P_{s}}{P^{0}} = \frac{N}{n+N}$ (2) $\frac{P^{0}}{P^{0}-P_{s}} = 1 + \frac{N}{n}$ (3) $\frac{P^{0}-P_{s}}{P_{s}} = \frac{n}{n+N}$ (4) $\frac{P_{s}}{P^{0}-P_{s}} = \frac{n}{n}$
- 40. The vapour pressure of a solution having solid as solute and liquid as solvent is :
 - (1) Directly proportional to mole fraction of the solvent
 - (2) Inversely proportional to mole fraction of the solvent
 - (3) Directly proportional to mole fraction of the solute
 - (4) Inversely proportional to mole fraction of the solute
- **41.** If P_0 and P_s are the vapour pressure of solvent and its solution respectively. N_1 and N_2 are the mole fraction of solvent and solute respectively then :

(1)
$$Ps = \frac{P_0}{N_2}$$

(2) $P_0 - Ps = P_0 N_2$
(3) $P_s = P_0 N_2$
(4) $\frac{(P_0 - P_s)}{P_s} = \frac{N_1}{(N_1 + N_2)}$

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42. One mol of non volatile solute is dissolved in two mol of water. The vapour pressure of the solution relative to that of water is

$(1)\frac{2}{2}$	$(2)\frac{1}{2}$
3	(-) 3
$(3) \frac{1}{2}$	$(4) \frac{3}{3}$
$(3)\frac{1}{2}$	$(4)\frac{1}{2}$

43. The vapour pressure of a dilute aqueous solution of Glucose is 750 mm of mercury at 373 K. The mole fraction of solute is :

(1) $\frac{1}{10}$ (2) $\frac{1}{7.6}$ (3) $\frac{1}{35}$ (4) $\frac{1}{76}$

44. The vapour pressure of water at room temperature is 23.8 mm of Hg. The vapour pressure of an aqueous solution of sucrose with mole fraction 0.1 is equal to:
(1) 23.9 mm Hg
(2) 24.2 mm Hg
(3) 21.42 mm Hg
(4) 31.44 mm Hg

45. The vapour pressure of pure A is 10 torr and at the same temperature when 1 g of B is dissolved in 20 gm of A, its vapour pressure is reduced to 9.0 torr. If the molecular mass of A is 200 amu, then the molecular mass of B is :
(1) 100 amu
(2) 90 amu
(3) 75 amu
(4) 120 amu

46. The boiling point of C_6H_6 , CH_3OH , $C_6H_5NH_2$ and $C_6H_5NO_2$ are 80°C, 65°C, 184°C and 212°C respectively. Which will show highest vapour pressure at room temperature : (1) C_6H_6 (2) CH_3OH (3) $C_6H_5NH_2$ (4) $C_6H_5NO_2$

- **47.** If Raoult's law is obeyed, the vapour pressure of the solvent in a solute in is directly proportional to :
 - (1) Mole fraction of the solvent
 - (2) Mole fraction of the solute
 - (3) Mole fraction of the solvent and solute
 - (4) The volume of the solution
- **48.** The vapour pressure of a pure liquid 'A' is 70 torr at 27° C. It forms an ideal solution with another liquid B. The mole fraction of B is 0.2 and total vapour pressure of the solution is 84 torr at 27° C. The vapour pressure of pure liquid B at 27° C is-(1) 14 (2) 56 (3) 140 (4) 70

49. The boiling point of an aqueous solution of a non volatile solute is 100.15°C. What is the freezing point of an aqueous solution obtained by diluting the above solution with an equal volume of water?

The values of K_b and K_f for wate rare 0.512 and 1.86 K molality⁻¹: (1) -0.544°C (2) -0.512°C (3) -0.272°C (4) -1.86°C

50. The molal elevation constant is the ratio of the elevation in B.P. to:

(3) Mole fraction of solute (4) Mole fraction of solvent

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(2) Molality

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- **51.** Elevation in boiling point was 0.52° C when 6 g of a compound x was dissolved in 100 g of water. Molecular weight of x is :(K = 5.2 K mol⁻¹100 g H₂O) (1) 120 (2) 60 (3) 100 (4) 342
- **52.** An aqueous solution containing 1g of urea boils at 100.25°C. The aqueous solution containing 3g of glucose in the same volume will boil at (1) 100.75°C (2) 100.5°C (3) 100°C (4) 100.25°C

53.Pure benzene freezes at 5.45° C at a certain place but a 0.374 m solution of tetrachloroethane in
benzene freezes at 3.55° C. The K_f for benzene is-
(1) $5.08 \text{ K Kg mol}^{-1}$
(2) $508 \text{ K Kg mol}^{-1}$
(3) $0.508 \text{ K Kg mol}^{-1}$
(4) 50.8° C Kg mol $^{-1}$

54. An aqueous solution freezes at -0.186° C (K_f = 1.86 K kg mol⁻¹; K_b = 0.512 K kg mol⁻¹). What is the elevation in boiling point ?

1.86	(1) 0.186	(2) 0.512	$(3) \frac{0.512}{1.86}$	(4) 0.0512
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- **55.** Camphor is used as solvent to determine the molecular weight of nonvolatile solute by rast method because for camphor -
 - (1) Molal depression constant is high
 - (2) Melting point is high
 - (3) Being cheap
 - (4) All

56. In the depression of freezing point experiment, it is found that:-

- (1) The vapour pressure of solution is more than of pure H_2O
- (2) The vapour pressure of solution is less than that of pure solute
- (3) Only solute molecules solidify at of freezing point
- (4) Only solvent molecules solidify at freezing point
- 57. Molal depression constant of water is1.86K Kg mo⁻¹ 0.02 mol of urea dissolved in 100 g of water will produce a depression in freezing point of :
 (1) 0.186°C
 (2) 0.372°C
 (3) 1.86°C
 (4) 3.72°C

58. What would be the freezing point of aqueous solution containing 18 g of $C_6H_{12}O_6$ in 1000 g of water? ($K_f = 1.86 \text{ K molality}^{-1}$) (1) -0.186°C (2) -0.372°C (3) -0.54°C (4) -0.72°C

59. A solution of 1.25 g of a non-electrolyte in 20 g of water freezes at 271.94 K. If $K_f = 1.86$ K molality⁻¹ then the molecular wt. of the solute is :

 (1) 207.8 g mol⁻¹
 (2) 179.79 g mol⁻¹

 (3) 209.6 g mol⁻¹
 (4) 96.01 g mol⁻¹

- **60.** If a thin slice of sugar beet is placed in concentrated solution of NaCl then
 - (1) Sugar beet will lose water from its cells
 - (2) Sugar beet will absorb water from solution
 - (3) Sugar beet will neither absorb nor lose water

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- (4) Sugar beet will dissolve in solution
- 61. In osmosis phenomenon net flow of :
 - (1) Solvent molecules occurs from higher concentration to lower concentration
 - (2) Solvent molecules occurs from lower concentration to higher concentration
 - (3) Solute molecules occurs from higher concentration to lower concentration
 - (4) Solute molecules occurs from lower concentration to higher concentration
- 62. At constant temperature the osmotic pressure of a solution is :
 - (1) Directly proportional to the concentration \cdot
 - (2) Inversely proportional to the concentration
 - (3) Directly proportional to the square of concentration
 - (4) Directly proportional \cdot to the square root of concentration
- 63. Which inorganic precipitate acts as semipermeable membrane? (2) Barium oxalate
 - (1) Calcium sulphate
 - (3) Nickel phosphate (4) Copper ferrocyanide
- 64. If 0.1 M solution of glucose and 0.1 M urea solution are placed on two sides of a semipermeable membrane to equal heights, then it will be correct to say that:
 - (1) There will be not net movement across the membrane
 - (2) Glucose will flow towards urea solution
 - (3) Urea will flow towards glucose solution
 - (4) Water will flow from urea solution towards glucose solution.

The best colligative property used for the determination of molecular masses of polymers is : **65**.

- (1) Relative lowering in vapour pressure (3) Elevation in boiling point
- (2) Osmotic pressure (4) Depression in freezing point

66. If mole fraction of the solvent in solution decreases then:

- (1) Vapour pressure of solution increases
- (3) Osmotic pressure increases

- (2) B.P. decreases
- (4) All are correct
- 67. The osmotic pressure of a solution increases if : (1) Temperature is lowered (2) Volume is increased (3) Number of solute molecules is increased (4) None
- **68.** Which of the following solutions at the same temperature will be isotonic : (1) 3.42 g of cane sugar in one litre water and 0.18 g of glucose in one litre water. (2) 3.42 g of cane sugar in one litre water and 0.18 g of glucose in 0.11 itre water. (3) 3.42 g of cane sugar in one litre water and 0.585g of NaCl in one litre water. (4) 3.42 g of cane sugar in one litre water and 1.17 g of NaCl in one litre water.
- If density of 2 molal sucrose solution is 1.4 g mL^{-1} 78. at 25°C, find osmotic pressure. **69**. (1) 4.06 atm (2) 2 atm (3) 40.6 atm (4) 3.4 atm
- 70. If total concentration of dissolved particles inside red blood cells is 0.3 M (approximate) and the membrane surrounding the cell is semipermeable. Find osmotic pressure inside the cell to say .that:

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	(1) 7.34 atm	(2) 1.78 atm	(3) 2.34 atm	(4) 0.74 atm
71.	Equal volume of (1)Lower osmoti (3) Higher osmot	0.1 M urea and 0.1 M g c pressure ic pressure	lucose are mixed. The (2) Same osmotic (4) None of these	mixture will have:- pressure
72.	Osmotic pressure $= 180$) in 60 g of	e of a solution (density water at 15°C is :	is 1g mL ^{-1}) containg 3	3 g of glucose (molecular weight
	(1) 0.34 atm	(2) 0.65 atm	(3) 6.25 atm	(4) 5.57 atm
73.	Osmotic pressur solution in mole	e of a sugar solution a per litre is :	at 24°C is 2.5 atmosp	phere. The concentration of the
	(1) 10.25	(2) 1.025	(3) 1025	(4) 0.1025
74.	A solution conta osmotic pressure (1) 14.97	ining 4 g of a non vola equal to 500 cm of mer (2) 149.7	atile organic solute pe cury at 27°C. The mol (3) 1697	er 100 ml was found to have an ecular weight of solute is : (4) 1.497
75.	A solution conta solution of ad org (1) 348.9	aining 8.6 g urea in on ganic, non volatile solute (2) 34.8g	e litre was found to e. The molecular weigh (3) 3489	be isotonic with 0.5% (wt./vol) ht of later is.: (4) 861.2
76.	If a 6.84% (w/V) thiocarbamide, th	solution of cane-sugar the molecular weigh	(mol. wt. 342) is isotor t of thiocarbamide is :	nic with 1.52% (w/V) solution of
	(1) 152	(2) 76	(3) 60	(4) 180
77.	A solution contai sucrose per litre.	ining 500 g of a protein The molecular mass of	per litre is isotonic wit	th a solution containing 3.42 g of
	(1) 5	(2) 146	(3) 34200	(4) 50000
78.	The osmotic pre be isotonic with	ssure of blood is 7.65 at blood is w/V :	tm. At 310 K. an aque	ous solution of Glucose that will
	(1) 5.41%	(2) 54.1%	(3) 3.5%	(4) 4.53%
		ABNORMAL COLI	LIGATIVE PROPER	TIES
79.	Equimolal soluti	ons of A and B show	depression in freezin	g point in the ratio of 2 : 1. A
	remains in norma (1) Normal	al state in solution. B wi (2) Associated	ll be in state in s (3) Hydrolysed	olution: (4) Dissociated
80.	Van't Hoff factor (1) Less than one (3) Always less t	is: in case of dissociation han one	(2) More than one(4) Less than one	in case of association in case of association
81.	The Van't Hoff f (1) 10	actor (i) for a dilute solu (2) 4	ation of $K_3[Fe(CN)_6]$ is (3) 5	s: (4) 0.25

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82.	The experimental me value because the val (1) Less than 1 (3) One	olecular weight of an ue of Van't Hoff facto	electrolyte will always be less than its calculated or, 'i' is : (2) Greater than 1 (4) Zero						
83.	The Van't Hoff facto (1) Zero	r (i) for a dilute aqueor (2) 1.0	us solution of Glucose is : (3) 1.5 (4) 2.0						
84.	0.585% NaCl solutio (1) 2.49 atm	n at 2rc has osmotic pr (2) 5 atm	essure. (3) 1.2 atm	(4) 3.8 atm					
85.	The substance A when dissolved in solvent B shows the molecular mass corresponding to A_3 . The Van't Hoff's factor will be-								
	(1) 1	(2) 2	(3) 3	$(4) \frac{1}{3}$					
86.	The ratio of the value of any colligative property for KCl solution to that for sugar solution is								
	(1) 1	(2) 0.5	(3) 2	(4) 2.5					
87.	The lowering of vapour pressure of 0.1M aqueous solutions of NaCl, CuSO ₄ and K_2SO_4 are : (1) All equal (2) In the ratio of 1 : 1 : 1.5 (3) In the ratio of 3 : 2 : 1 (4) In the ratio of 1 5 : 1 : 2 5								
88.	The freezing point of 1 molal NaCl solution assuming NaCl to be 100% dissociated in water is $(K_f = 1.86 \text{ K Molality}^{-1})$								
89.	The molal elevation constant of water is 0.51. The boiling point of 0.1 molal aqueous NaCl solution is nearly:								
	(1) 100.05°C	(2) 100.1°C	(3) 100.2°C	(4) 101.0°C					
90.	The molal elevation constant of water is 0. 52K molality ⁻¹ . The boiling point of 1. 0 molal aqueous KCl solution (assuming complete dissociation of KCl), should be : (1) 100.52° C (2) 101.04° C (3) 99.48° C (4) 98.96° C								
91.	Solute A is ternary electrolyte and solute B is non-electrolyte. If 0.1 M solution of solute B produces an osmotic pressure of 2P, then 0.05M solution of A at the same temperature will produce an osmotic pressure equal to :								
	(1) P	(2) 1.5P	(3) 2P	(4) 3P					
92.	Phenol associates in $\begin{bmatrix} 1 \\ C \end{bmatrix}$	benzene as							
	$C_{6}\Pi_{5} \cup \Pi_{1} = \frac{(C_{6}\Pi_{5} \cup \Pi_{2})}{2}$ If degree of association of phenol is 40%. Van't Hoff factor i is :								
	(1) 1	(2) 0.8	(3) 1.4	(4) 0.6					
93.	The values of observed and calculated molecular weight of calcium nitrate are respectively 65.6 and 164. The degree of dissociation of calcium nitrate will be :								

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	(1) 25%	(2) 50%	(3) 75%	(4) 60%					
94.	A 0.004M solution of Na_2SO_4 is isotonic with a 0.010M solution of glucose at the 25 temperature. The apparent degree of dissociation of Na_2SO_4 is								
	(1) 1	(2) 2	(3) 3	(4) 3					
96.	A 5.8% (wt./vol.) NaCl solution will exert an osmotic pressure closest to which one of following:								
	(1) 5.8% (wt./vol) su(3) 2 M sucrose solution	crose solution tion	(2) 5.8% (wt./vol) glucose solution(4) 1M glucose solution						
96.	Which salt shows ma (1) AgNO ₃	aximum osmotic pressu (2) Na ₂ SO ₄	re in its 1M solution: (3) (NH ₄) ₃ PO ₄	(4) MgCl ₂					
97.	Which solution will (1) 1M glucose solut (3) 1M Alum solutio	exert highest osmotic p ion n	oressure? (2) 1M urea (4) 1M						
98.	 Which is the correct relation between osmotic pressure 0.1 M NaCl solution and 0.1M Na₂SO₄ solution? (1) The osmotic pressure of Na₂SO₄ is less than (2) The osmotic pressure Na₂SO₄ is more than NaCl solution (3) Both have same osmotic pressure (4) None of the above 								
99.	 Which one of the following solutions will have highest osmotic pressure ? (Assume that all the salts are equally dissociated) (1) 0.1M Al₂(SO₄)₃ (2) 0.1M BaCl₂ (3) 0.1 M Na₂SO₄ (4) The solution obtained by mixing equal volumes of (2) and (3) 								
100.	The following soluti	ons have equal conce	ntrations. Which one	will show minimum osmotic					
	pressure? (1) BaCl ₂	(2) $AgNO_3$	(3) Na ₂ SO ₄	(4) (NH ₄) ₃ PO ₄					
101.	The osmotic pressure of equimolor solutions of $BaCl_2$, NaCl, and glucose will be in the order :(1)Glucose > NaCl > BaCl_2(2) $BaCl_2 > NaCl > Glucose$ (3) NaCl > BaCl_2 > Glucose(4) NaCl > Glucose > BaCl_2								
102.	Which one of the following pairs of solutions will be expected to be isotonic under the same temperature ?(1) 0.1 M urea and 0.1 M NaCl(2) 0.1 M urea and 0.2 M MgCl2								
103.	Two solutions of KNO ₃ and CH ₃ COOH are prepared separately. Molarity of both is 0.1 M and osmotic pressures are P_1 and P_2 respectively. The correct relationship between the osmotic pressures is								

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	(1) $P_2 > P_1$	(2) $P_1 = P_2$							
	(3) $P_1 > P_2$	(4) $\frac{P_1}{P_1 + P_2} = \frac{P_2}{P_1 + P_2}$							
104.	The correct relationship between the boiline $CaCl_2(T_2)$, having the same molar concentration $(1)T_1 = T_2$ (2) $T_1 > T_2$	ng points of very dilute solutions of $AlCl_3(T_1)$ and ation is : (3) $T_2 = T_1$ (4) $T_2 > T_2$							
	$(1)1_1 - 1_2$ (2) $1_1 > 1_2$	$(3) 1_2 - 1_1 \qquad (4) 1_2 \ge 1_1$							
105.	Which of the following 0.1 M aqueous solu(1) Potassium Sulphate(3) Urea	tions will have the lowest freezing point : (2) Sodium Chloride (4) Glucose							
106.	Which aqueous solution has minimum freezing point?								
1000	(1) 0.01 M NaCl	(2) $0.005 \text{ M C}_2\text{H}_5\text{OH}$							
	(3) 0.005 M MgI_2	(4) 0.005 M MgSO ₄							
107.	If a is the degree of dissociation of $K_4[Fe(CN)_6$, then abnormal mass of complex in the solution will be:-								
	(1) $M_{normal} (1 + 2\alpha)^{-1}$	(2) $M_{normal} (1 + 3\alpha)^{-1}$							
	(3) $M_{normal} (1 + \alpha)^{-1}$	(4) $M_{normal} (1 + 4\alpha)^{-1}$							
108.	Which solution will have least vapour press	sure :							
	(1) 0.1 M BaCl ₂	(2) 0.1 M urea							
	(3) 0.1 M Na_2SO_4	(4) 0.1 M Na ₃ PO ₄							
109.	Which has maximum freezing point :								
	(1) 1 molar of NaCl solution	(2) 1 molar of KCl solution							
	(3) 1 molar of CaCl ₂ solution	(4) 1 molar of urea solution							
110	The freezing point of 1% aqueous solution	of calcium nitrate will be :							
110.	(1) 0° C (2) Above 0° C	(3) 1° C (4) Below 0° C							
111.	The following aqueous solution in the corre	ect order of decreasing freezing point is -							
	(1) 0.2 M BaCl_2 , 0.2 M KCl , $0.1 \text{ M Na}_2\text{SO}_2$	1							
	(2) 0.2 M KCl, 0.1 M Na ₂ SO ₄ , 0.2 M BaCl ₂ (3) 0.1 M Na SO ~ 0.2 M KCl ~ 0.2 M PaCl	2							
	$(3) 0.1 \text{ M} \text{Na}_2\text{SO}_4, 0.2 \text{ M} \text{KCI}, 0.2 \text{ M} \text{BaCI}_2$ $(4) 0.1 \text{ M} \text{Na}_2\text{SO}_4, 0.2 \text{ M} \text{BaCI}_2, 0.2 \text{ M} \text{KCI}_2$								
	(1) 0.1 W1 W2504, 0.2 W Buc12, 0.2 W RC								
112.	Which of the following solutions will have	highest boiling point ?							
	(1) 1% Glucose in water	(2) 1% Sucrose in water							
	(3) 1% Naa in water	(4) 1% Urea in water							
113	The freezing point of equimolal aqueous so	lution win he highest for .							
	(1) $C_6H_5NH_3Cl$	$(2) Ca(NO_3)_2$							
	(3) $La(NO_3)_3$	(4) $C_6H_{12}O_6$ (Glucose)							
11/	When monomia Is dide is added to the	ous solution of notossium is dide 9							
114.	(1) The boiling point does not change	(2) Freezing point is raised							
	(3) The freezing point is lowered	(4) Freezing point does not change							
	0r								

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- **115.** The molecular weight of benzoic acid in benzene as determined by depression in freezing point method corresponds to:
 - (1) Ionisation of benzoic acid(3) Trimerization of benzoic acid
- (2) Dimerization of benzoic acid
- (4) Solvation of benzoic acid
- **116.** 0.1M solution of K_2SO_4 is dissolved to the extent of 90%. What would be its osmotic pressure at 27°C :-(1) 6.89 atm (2) 0.689 atm (3) 0.344 atm (4) 3.4 atm
- 117. Which one has same Van't Hoff factor I as that of Hg_2Cl_2 :-(1) NaCl (2) Na₂SO₄ (3) Al(NO₃)₃ (4) Al₂(SO₄)₃

ANSWER KEY													
EXERCISE-I (Conceptual Questions)													
1.	(3)	2.	(4)	3.	(4)	4.	(4)	5.	(3)	6.	(4)	7.	(4)
8.	(3)	9.	(2)	10.	(2)	11.	(3)	12.	(3)	13.	(2)	14.	(1)
15.	(2)	16.	(3)	17.	(2)	18.	(2)	19.	(2)	20.	(4)	21.	(1)
22.	(1)	23.	(4)	24.	(1)	25.	(4)	26.	(2)	27.	(2)	28.	(1)
29.	(3)	30.	(4)	31.	(2)	32.	(4)	33.	(3)	34.	(2)	35.	(1)
36.	(1)	37.	(1)	38.	(3)	39.	(2)	40.	(1)	41.	(2)	42.	(1)
43.	(4)	44.	(3)	45.	(2)	46.	(2)	47.	(1)	48.	(3)	49.	(3)
50.	(2)	51.	(2)	52.	(4)	53.	(1)	54.	(4)	55.	(1)	56.	(4)
57.	(2)	58.	(1)	59.	(4)	60.	(1)	61.	(2)	62.	(1)	63.	(4)
64.	(1)	65.	(2)	66.	(3)	67.	(3)	68.	(2)	69.	(3)	70.	(1)
71.	(2)	72.	(3)	73.	(4)	74.	(2)	75.	(2)	76.	(2)	77.	(4)
78.	(1)	79.	(2)	80.	(4)	81.	(2)	82.	(2)	83.	(2)	84.	(2)
85.	(4)	86.	(3)	87.	(2)	88.	(2)	89.	(2)	90.	(2)	91.	(4)
92.	(2)	93.	(3)	94.	(3)	95.	(3)	96.	(3)	97.	(3)	98.	(2)
99.	(1)	100.	(2)	101.	(2)	102.	(4)	103.	(3)	104.	(2)	105.	(1)
106.	(1)	107.	(4)	108.	(4)	109.	(4)	110.	(4)	111.	(3)	112.	(3)
113.	(4)	114.	(2)	115.	(2)	116.	(1)	117.	(2)		~ /		