

# Yakeen NEET 2.0 2026

## Practice Sheet Physical Chemistry By Amit Mahajan Sir Solutions

**Q1** Two liquids A & B form an ideal solution. What is the vapour pressure of solution containing 2 moles of A and 3 moles of B at 300 K ?

[Given : At 300 K, Vapour pressure of pure liquid A ( $P_A^\circ$ ) = 100 torr

Vapour pressure of pure liquid B ( $P_B^\circ$ ) = 300 torr ]

- |              |                   |
|--------------|-------------------|
| (A) 200 torr | (B) 140 torr      |
| (C) 180 torr | (D) None of these |

**Q2** The value of Henry's constant for three different gases A, B & C at 298 K are 40.3 K bar, 1.67 K bar &  $1.83 \times 10^{-5}$  K bar respectively. Which of the following order is correct increasing order of solubility of the gases in water?

- |             |             |
|-------------|-------------|
| (A) B, A, C | (B) A, B, C |
| (C) C, B, A | (D) C, A, B |

**Q3** The van't Hoff factor for 0.1 M Ba(NO<sub>3</sub>)<sub>2</sub> solution is 2.74. The degree of dissociation is

- |           |         |
|-----------|---------|
| (A) 91.3% | (B) 87% |
| (C) 100%  | (D) 74% |

**Q4** Which of the following ideal aqueous solutions will show maximum boiling point.?

- (A) 0.5 M NaCl showing 50% dissociation
- (B) 0.3 M K<sub>2</sub>Fe[Fe(CN)<sub>6</sub>]<sup>4-</sup>
- (C) 1 M Glucose solution
- (D) 1 mole of AgCl is mixed with 0.5 L of H<sub>2</sub>O

**Q5** Which of the following options is correct with respect to comparison of Henry's constant K<sub>H</sub> of

different gases at different temperatures?

- (A) K<sub>H</sub> of O<sub>2</sub> at 303K < K<sub>H</sub> of Ar at 298K
- (B) K<sub>H</sub> of O<sub>2</sub> at 293K > K<sub>H</sub> of N<sub>2</sub> at 293K
- (C) K<sub>H</sub> of CH<sub>4</sub> at 298K < K<sub>H</sub> of O<sub>2</sub> at 293K
- (D) K<sub>H</sub> of He at 293K < K<sub>H</sub> of N<sub>2</sub> at 293K

**Q6** **Statement-1:** No solvent flows across SPM separating two isotonic solutions

**Statement-2:** Isotonic solutions have same osmotic pressure.

- (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1
- (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
- (C) Statement-1 is true, statement-2 is false.
- (D) Statement-1 is false, statement-2 is true.

**Q7** Which of the following aqueous solutions will have maximum vapour pressure?

- (A) 0.05M K<sub>4</sub>[Fe(CN)<sub>6</sub>]<sup>4-</sup>
- (B) 0.02M BaCl<sub>2</sub>
- (C) 20%w/w glucose solution
- (D) An aqueous solution of I<sub>2(s)</sub> in water having mole fraction of Iodine equal to 0.01 .

**Q8** An aqueous solution of a non volatile solute is such that the vapour pressure is 25% lesser than that of water at same temperature. The molality of the solution will be

- (A)  $\frac{1000}{54} \text{m}$
- (B)  $\frac{1000}{72} \text{m}$



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- (C)  $\frac{3000}{54} \text{ m}$  (D)  $\frac{3000}{72} \text{ m}$
- Q9** A  $\frac{M}{10}$  solution of potassium ferrocyanide is 46% dissociated at 18°C. What will be its osmotic pressure?  
 (A) 2.4 atm (B) 3.5 atm  
 (C) 6.8 atm (D) 10 atm
- Q10** 20 g of non-electrolyte, non-volatile solute ( $C_xH_{2x}O_x$ ) when dissolved in 100 g of water at 100°C, lowers the vapour pressure of solution  $(\frac{1}{100})^{\text{th}}$  th by of the vapour pressure of pure water. What is the formula of compound?  
 (Assume dilute solution)  
 (A)  $C_6H_{12}O_6$  (B)  $C_{12}H_{24}O_{12}$   
 (C)  $C_{44}H_{86}O_{44}$  (D)  $C_3H_6O_3$
- Q11** **Statement-1:** Addition of ethylene glycol (non-volatile) to water lowers the freezing point of water hence used as antifreeze.  
**Statement-2:** Addition of any substance to water lowers the freezings point.  
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.  
 (B) Statement-1 is true, statement-2 is true and statement-2 is Not explanation for statement-1.  
 (C) Statement-1 is true, statement-2 is false.  
 (D) Statement-1 is false, statement-2 is true.
- Q12** Liquid benzene freezes at 7°C and boils at 77°C. If the  $K_f$  and  $K_b$  values for benzene are 5.0 K-Kg/mol and 2.50 K-Kg/mol respectively, calculate the ratio of the molar latent heat of fusion to the molar latent heat of vaporisation.  
 (A) 3.125 (B) 0.4  
 (C) 1.28 (D) 0.32
- Q13** Water &  $HNO_3$  form a non ideal solution. If 36 g of water is mixed with 126 g of  $HNO_3$  vapor

- pressure of water and  $HNO_3$  in pure state at 298 K are 360 torr & 300 torr respectively then what could be the vapour pressure of the above solution at 298 K ?  
 (A) 330 torr (B) 350 torr  
 (C) 250 torr (D) 370 torr
- Q14** The system that forms maximum boiling azeotrope is  
 (A) Carbon disulphide – acetone  
 (B) Benzene - Toluene  
 (C) Acetone - Chloroform  
 (D) n-Hexane - n-Heptane
- Q15** Calculate osmotic pressure of 0.5 M aqueous  $AlCl_3$  solution. ( $\alpha = 0.8$ ) at 27°C  
 (A) (1.7) RT (B) (3.4) RT  
 (C) (0.5) RT (D) RT
- Q16** A 0.040 M solution of each of the following compound is prepared. Which solution would you expect to freeze at  $-0.149^\circ C$ ? [ $K_f$  (water) = 1.86 K Kg mol $^{-1}$ ]. [Assume very dilute aqueous solution]  
 (A)  $[Co(en)_2Cl_2]Cl$  (B)  $K_4[Fe(CN)_6]$   
 (C)  $[Cr(Py)_5Cl]Cl_2$  (D)  $[Cr(NH_3)_6]Cl_3$
- Q17** A sample of acetone undergoes 40% dimerization. Then mole fraction of the dimer in the final mixture is  
 (A) 0.16 (B) 0.75  
 (C) 0.4 (D) 0.25
- Q18** **Statement-1:** Addition of  $HgI_2$  to aqueous solution of  $KI$  decreases the boiling point.  
**Statement-2:** A complex  $K_2[HgI_4]$  is formed.  
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.  
 (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation


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for statement-1

- (C) Statement-1 is true, statement-2 is false  
(D) Statement-1 is false, statement-2 is true

**Q19** Equal volume of 1 M urea(aq) and 1 M NaCl(aq) are placed in opposite sides of a U-tube, separated by semipermeable membrane (through which only water can diffuse). What will the setup look like at equilibrium?

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(D) Can be any of above arrangement depending upon temperature.

**Q20** Scuba divers when go in deep sea face a very painful situation known as "bends", the formation of N<sub>2</sub> bubbles around the joints due to decrease in solubility of N<sub>2</sub> as a result of reduced pressure, when the diver rises up towards sea surface. This situation is avoided by

- (A) Taking only pure O<sub>2</sub> in breathing cylinders
  - (B) Replacing some N<sub>2</sub> by He, which is more soluble than N<sub>2</sub>.
  - (C) Replacing some N<sub>2</sub> by He, which is less soluble than N<sub>2</sub>.
  - (D)

This situation can not be avoided and therefore pain killers are consumed

**Q22** The Henry's law constant for solubility of a gas A is  $10^5$  atm. The mole fraction of gas A in gaseous mixture is 0.4. Calculate the number of mole of gas A from gaseous mixture dissolved in 25 mol of water at 300 K and 10 atm pressure.

- (A) 0.1
  - (B) 0.01
  - (C) 0.001
  - (D)  $2.5 \times 10^{-3}$

**Q23 Statement-1:** Vapour pressure decreases when Toluene is added to benzene.

**Statement-2:** Vapour pressure is the colligative property of solution.

- (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
  - (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
  - (C) Statement-1 is false, statement-2 is true
  - (D) Statement-1 is true, statement-2 is false

**Q24** The relative lowering in vapour pressure for a solution containing 1 mole  $\text{CaCl}_2$  in 180 grams  $\text{H}_2\text{O}$  will be:

- (A)  $\frac{1}{11}$       (B)  $\frac{3}{11}$   
 (C)  $\frac{1}{13}$       (D)  $\frac{3}{13}$

**Q25** The abnormal molecular mass of  $\text{CH}_3\text{COOH}$  when dissolved in benzene is found to be 80



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molarity of the two solutions will be

- (A) Equal
- (B) That of NaCl will be less than that of KCl
- (C) That of NaCl will be more than that of KCl solution
- (D) That of NaCl will be half of that of KCl solution

**Q36 Assertion:** The sum of the mole fraction of all the components in a solution are unity.

**Reason:** Mole fraction is a temperature dependent mode of concentration.

- (A) Both assertion and reason are correct and reason is the correct explanation of assertion.
- (B) Both assertion and reason are correct but the reason is not the correct explanation of assertion.
- (C) Assertion is true but reason is false
- (D) Assertion is false but reason is true

**Q37** Which of the following is not a binary solution?

- (A) Pure water + Sugar
- (B) Air
- (C) Mixture of benzene and toluene
- (D) Mixture of ethanol and methanol

**Q38** Henry's law constant for the solubility of methane in benzene at 298 K. is  $4.27 \times 10^5$  mm Hg. Calculate the mole fraction of methane in benzene at 298 K. under partial pressure 760 mmHg.

- (A)  $1.78 \times 10^{-3}$
- (B)  $1.78 \times 10^{-2}$
- (C)  $1.78 \times 10^{-1}$
- (D) 1.78

**Q39** Low concentration of oxygen in the blood and tissues of people living at high altitude is due to

- (A) Low temperature
- (B) Low atmospheric pressure
- (C) High atmospheric pressure
- (D)

Both low temperature and high atmospheric pressure

**Q40 Assertion:** Cooking time is reduced in pressure cookers.

**Reason:** Boiling point of water inside the pressure cooker is raised.

- (A) Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- (B) Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- (C) Assertion is True but Reason is false
- (D) Assertion is false but Reason is true.

**Q41** Which of the following is a characteristic of non-ideal solution with negative deviation?

- (A)  $\Delta V_{mix} < 0$
- (B)  $\Delta H_{mix} > 0$
- (C)  $\Delta S_{mix} < 0$
- (D)  $\Delta G_{mix} > 0$

**Q42** The azeotropic mixture of water (B.P 100°C) and HCl (B.P. 85°C) boils at 108.5°C. When this mixture is distilled, it is possible to obtain :

- (A) Pure HCl
- (B) Pure water
- (C) Pure water as well as HCl
- (D) Neither HCl nor  $H_2O$  in their pure state

**Q43** At 40° C, vapour pressure in torr of methanol and ethanol solution is  $P = 119x + 135$ , where x is the mole fraction of methanol, Hence:

- (A) vapour pressure of pure methanol is 11 torr
- (B) vapour pressure of pure ethanol is 135 torr
- (C) vapour pressure of equimolar mixture of each is 127 torr
- (D) mixture is completely immiscible.

**Q44** If vapour pressures of pure liquids 'A' & 'B' are 300 torr and 800 torr respectively at 25°C.



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When these two liquids are mixed at this temperature to form a solution in which mole percentage of 'B' is 92, then the total vapour pressure is observed to be 0.95 atm. Which of the following is true for this solution ?

- (A)  $\Delta V_{mix} > 0$
- (B)  $\Delta H_{mix} < 0$
- (C)  $\Delta V_{mix} = 0$
- (D)  $\Delta H_{mix} = 0$

**Q45 Assertion:**  $\Delta H_{mix}$ . &  $\Delta V_{mix}$ . for the preparation of ideal solution is zero.

**Reason:** For components of ideal solution, A-B interaction are similar to A-A & B-B interactions in the two liquids before mixing

- (A) Both Assertion & Reason are True but Reason is a correct of the Assertion
- (B) Both Assertion & Reason are True but Reason is not a correct of the Assertion
- (C) Assertion is True but Reason is false
- (D) Assertion is false but reason is true.



# Answer Key

Q1 (D)  
Q2 (B)  
Q3 (B)  
Q4 (B)  
Q5 (C)  
Q6 (D)  
Q7 (B)  
Q8 (A)  
Q9 (C)  
Q10 (B)  
Q11 (C)  
Q12 (D)  
Q13 (C)  
Q14 (C)  
Q15 (A)  
Q16 (A)  
Q17 (D)  
Q18 (A)  
Q19 (B)  
Q20 (C)  
Q21 (B)  
Q22 (C)  
Q23 (C)

Q24 (D)  
Q25 (A)  
Q26 (B)  
Q27 (D)  
Q28 (C)  
Q29 (D)  
Q30 (D)  
Q31 (C)  
Q32 (A)  
Q33 (C)  
Q34 (A)  
Q35 (C)  
Q36 (C)  
Q37 (B)  
Q38 (A)  
Q39 (B)  
Q40 (A)  
Q41 (A)  
Q42 (D)  
Q43 (B)  
Q44 (B)  
Q45 (A)



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