

Instructions :- 1. All questions are compulsory **Total Marks: 50**

2. Each question carry two marks

3. Log table & calculator allowed to use wherever necessary

Que. Read each question carefully and choose the appropriate alternative a, b, c or d.

1. In case of ..... the sum of partial pressures is the same as the observed pressure of solution.  
a. real solution                      **b. ideal solution**  
c. non-ideal solution                d. dilute solution
2. The number of moles of solute dissolved in ..... of solvent is known as molality  
a. **1 kilogram**                        b. 1 litre  
c. 1 gram                                d.  $1 \text{ dm}^3$
3. The temperature at which two liquids which are partially miscible become completely miscible in all proportions is known as.....  
a. critical temperature                b. boiling temperature  
**c. consolute temperature**        d. freezing temperature
4. In fractional distillation of binary solution the more volatile component is obtained in distillate and less volatile component as liquid residue with change in composition is known as.....  
a. azeotropic solution                b. heterogeneous mixture  
**c. zeotropic solution**                d. immiscible solution
5. The potential generating due to diffusion of ions across the boundary between two solutions is called.....  
a. single electrode potential        **b. liquid-liquid junction potential**  
c. cell potential                        d. redox potential

6. From thermodynamic point of view, maximum electrical work done by the cell is given by.....

- a. decrease in Gibb's free energy change
- b. increase in Gibb's free energy change
- c. increase in rotational energy
- d. decrease in quantum efficiency

7. What is the emf of the following chemical cell without transference at 298K

Pt | H<sub>2</sub> (g, 1 atm) | HCl a= 0.1 | calomel electrode  
Given  $E^{\circ}_{cal} = 0.268v$ ,  $2.303RT/nF = 0.0591$

- a. 0.327v
- b. -0.327v
- c. 3.27v
- d. -3.27v

8. In calomel electrode pure mercury is covered by a paste of ..... is in contact with an aqueous solution of potassium Chloride.

- a. Hg and KCl
- b. Hg and Hg<sub>2</sub>Cl<sub>2</sub>
- c. Cd and CdCl<sub>2</sub>
- d. both A and B

9. Find the correct name of the following electrochemical cell  
Pt, H<sub>2</sub>(g, Patm.) | HCl a<sub>1</sub> | HCl a<sub>2</sub> | H<sub>2</sub> (g, Patm), Pt<sup>+</sup>

- a. Electrolyte concentration cell without transference
- b. Electrode concentration cell
- c. Chemical cell with transference
- d. Electrolyte concentration cell with transference

10. Select the correct alternative and complete the representation of electrode concentration cell reversible to cation.

- $-Zn(Hg), a_1 | Zn^{++} | \dots +$
- a. Zn(Hg), a<sub>2</sub>
  - b. Zn(Hg), a<sub>1</sub>
  - c. Zn(s)
  - d. Cu(s)