



- Q-4**      **Attempt all questions**      **(14)**
- A. Discuss various types of physical properties of 3d transition element.      **(5)**
- B. Define: Joule Thomson effect. Explain Joule Thomson co-efficient and inversion temperature.      **(5)**
- C. Explain Non Stochiometric and Interstitial compounds.      **(4)**
- Q-5**      **Attempt all questions**      **(14)**
- A. Give Dieckmann's and Perkin method to prepare cyclo alkanes.      **(5)**
- B. Write a short note on heat of hydrogenation and stability of alkenes.      **(5)**
- C. For 10% (W/W) solution of NaCl what is the mole fraction of each component in the solution?      **(4)**
- Q-6**      **Attempt all questions**      **(14)**
- A. Write the reactions of cycloalkanes with halogen and halogen acids.      **(5)**
- B. Explain  $E^1$  and  $E^2$  reaction.      **(5)**
- C. For preparing 28% W/W  $H_2SO_4$  solution how many grams of  $H_2SO_4$  is required if 50 gm of  $H_2O$  is used?      **(4)**
- Q-7**      **Attempt all questions**      **(14)**
- A. Derive  $C_p - C_v = R$ .      **(5)**
- B. Write the statement of zeroth law of thermodynamic and derive its mathematical form.      **(5)**
- C. Give the differences between physisorption and chemisorption.      **(4)**
- Q-8**      **Attempt all questions**      **(14)**
- A. Describe Freundlich Adsorption isotherm.      **(5)**
- B. Derive the equation of pH,  $K_h$  and degree of hydrolysis of a salt of a weak acid and weak base.      **(5)**
- C. Calculate pH before and after the addition of 0.01 mole of NaOH to 1 liter of a buffer solution that is 0.1 M  $CH_3COOH$  and 0.1 M is  $CH_3COONa$ . The  $K_a$  of  $CH_3COOH$  is  $1.75 \times 10^{-5}$ .      **(4)**

