Sub Code: BAST-101 **ROLL NO……..……..**

II SEMESTER EXAMINATION 2022 – 23
B. Tech I
Engineering Chemistry

Duration: 3:00 hrs **Max Marks: 100**

Note: - Attempt all questions. All Questions carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption made in the answer.

Q 1.	Answer any four parts of the following. a. What is the Effective Nuclear Charge? Explain it. b. What is the scale and sludge formation? c. Differentiate between inter and intra-molecular H- bonding. d. How polymers are classified on the basis of their structure (Tacticity)? Discuss with example. e. Distinguish between Cloud point and Pour point. f. Write note on conducting polymer.	5x4=20
Q 2.	Answer any four parts of the following. a. Describe the reactions involved in the lime soda process of water softening. b. Why electron affinity of fluorine is less than that of chlorine. c. A zeolite softener was 80% exhausted, when 10,000 L of hard water was passed through it. The softener required 150 L of NaCl solution (50g NaCl/L of solution). What is the hardness of water? d. Why p-nitrophenol is more water soluble than o-nitrophenol. e. A Compound has molecular formula $C_{10}H_{14}$. It gives the following NMR data (i) 0.88 δ (9H singlet) (ii) 7.28 (5H, singlet, aromatic). Assign the structural formula of the compound. f. Differentiate between Thermoplastic & Thermosetting polymers.	5x4=20
Q 3.	Answer any two parts of the following. a. What are the limitations of raw rubber? Explain the process of vulcanization. b. What is corrosion? Describe the mechanism of electro-chemical corrosion by (i) Hydrogen evolution (ii) Oxygen absorption. c. Explain the Phase diagram for water system and calculate degree of freedom for all areas, lines and triple point.	10x2= 20
Q 4.	Answer any two parts of the following. a. Explain the mechanism of Thick film lubrication and Thin film lubrication.	10x2= 20

	b. Describe the working of an ion exchange process for the softening of hard water. How is exhausted ion exchanger regenerated? c. Discuss synthesis and uses of following industrial polymers. (i) Nylon 6, 6 (ii) PET (iii) PAN (iv) PMMA (v) PVC	
Q 5.	Answer any two parts of the following. a. (i) What do you understand by modes of vibration? Explain with suitable example. (ii) Explain the various applications of IR spectroscopy. b. (i) Write note on the electronic transition caused by energy absorbed in the UV region. (ii) What do you understand by Red shift and blue shift in UV spectroscopy? c. Write short note any two of the following (i) Anisotropic effect (ii) Chemical Shift and TMS (iii) Applications of NMR.	10x2= 20

****