



JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination 2014

B. Tech. I year, Semester I CH-101 (Backlog)

Roll No.....

CH101: ENGINEERING CHEMISTRY-I

Time: 3.00 hours

Max. Marks: 100

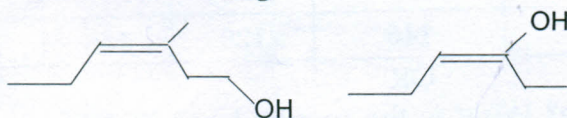
Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1 Objective type (1 marks each)

10

- i. Write the Structure of Di sodium salt of EDTA.
- ii. Write the formula of Viscosity Index of a Lubricant.
- iii. Write the chemical name of common glass.
- iv. Give the structure of monomer of Teflon.
- v. Give the formula of four salts responsible for permanent hardness in water.
- vi. $1 \text{ ppm} = \dots\dots\dots \text{mg/l} = \dots\dots\dots ^\circ\text{Fr} = \dots\dots\dots ^\circ\text{Cl}.$
- vii. Write the chemical name of C_4AF .
- viii. Give the structure of Buna-S
- ix. Write the formula to convert hardness into equivalent of CaCO_3 .
- x. Assign the E and Z for following:



Q.2 Short answer type questions (2.5 marks each)

10

- i. Define the Flash and fire point for a lubricant.
- ii. Give the classification of polymers on the basis of Structure.
- iii. Explain the priming and Foaming in boilers.
- iv. Why does hard water consume a lot of soap, explain with chemical reactions.

Q.3A Define SCALE and SLUDGE formation in Boilers.

5

Q.3B Give the five differences between Thermoplastic and Thermosetting Polymers.

5

Q.4A The hardness of 5,000 L of water was removed by Zeolite process. To regenerate the Zeolite 100 L of NaCl of strength 125 gm/ L was consumed. Calculate the hardness of water in ppm.

5

Q.4B Give the significance of viscosity in lubricating oil. How the viscosity is determined by Red-wood viscometer?

5

- Q.5A Explain the Zeolite process of water softening with reactions. 5
- Q.5B Explain any two type of mechanism of Lubrication. 5

Q.6A What is Glass? Explain its manufacture by flow diagram and role of annealing process. 5

Q.6B Give chemical reactions taking place in different zones of rotary kiln process. 5

Q.7A Write short notes on Cloud point and pour point, steam emulsification number. 5

Q.7B Write a short note on Vulcanization of rubber with reaction? 5

OR

Q.7B Write a detail note on Setting and Hardening of Portland Cement with all reactions. 5

Q.8 Give the preparations and properties of following polymer. 10

(i) Polystyrene (ii) PMMA (iii) PVC (iv) Nylon 6:6 (v) SBR

OR

Q.8 Give the mechanism of Aldol Condensation and Backmann Rearrangement reactions. 10

Q.9 Calculate the Temporary and Permanent and Total hardness of a sample of water in ppm and in $^{\circ}\text{Fr}$. This water sample on analysis gives following impurities: 10

Impurity	$\text{Ca}(\text{HCO}_3)_2$	$\text{Mg}(\text{HCO}_3)_2$	MgSO_4	CaSO_4	CaCl_2
Quantity (mg/L)	10.5	12.5	2.6	7.5	8.2
Mol.Wt.	162	146	120	136	111

OR

Q.9 Explain the optical Isomerism? What is the required condition to show optical isomerism give with example? 10

Q.10 A standard hard water contains 15 gm CaCO_3 per liter. 20 ml of this required 25 ml of EDTA solution. 100 ml of water sample required 18 ml of same EDTA solution up to end point. The same sample after boiling required 12 ml of EDTA solution. Calculate the Temporary and Permanent hardness of water sample. 10