

# JK Lakshmipat University, Jaipur

## Institute of Engineering and Technology

End -Term Examination

B.Tech. I Year, I Semester 2013 (Common to all Branches)



Course Name: Engineering Chemistry-I

Max Marks: 40

Course Code: CH-101

Time: 03.00 Hrs

### Instructions:

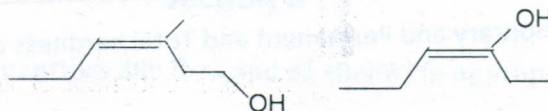
1. Attempt all Sections, Calculator is allowed.
2. Balanced equations must be given wherever possible and diagrams where they are helpful.

### SECTION 'A'

Q.1. Attempt all parts.

(1x 5 = 5 Marks)

- (a) Write the formula of di sodium salt of EDTA.
- (b) Give the monomers for the preparation of polyester.
- (c) Write the formula to calculate the Specific rotation of an optical isomer.
- (d) Write the formula of Viscosity Index.
- (e) Assign the E and Z for following



Q.2 Attempt both parts.

(2x2.5 = 5 Marks)

- (a) Describe the process of demineralization of water using Zeolite Process with reactions and specify its advantages.
- (b) Write short notes on Borosilicate and Potash Glass with their uses.

### SECTION 'B'

(4x5 =20 marks)

(Attempt any FOUR Questions)

- Q.3
  - (a) Why does Graphite act as a good lubricant on the metal surface?
  - (b) Explain the formation, structure and stability order of Carbocation.
- Q.4
  - (a) Give the mechanism of Aldol and Backmann rearrangement.
  - (b) What is lubricant? Explain Boundary lubrication with diagram?

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- Q.5 (a) Explain the optical Isomerism? What is the required condition to show optical isomerism give with example?  
 (b) Give the five differences between Thermoplastic and Thermosetting Polymers.
- Q.6 (a) Write short note on (i) Burning zone of rotary Klin (ii) Annealing of Glass  
 (b) Give the mechanism of  $SN_1$  reaction with energy profile diagram taking suitable example
- Q.7 Give the Preparation, properties and uses of following polymers:  
 (i) PMMA (ii) Nylon 6:6 (iii) NBR (iv) Neoprene (v) Teflon

### SECTION 'C'

(3+3+4 = 10 marks)

- Q.8 (a) Write a detail note on Setting and Hardening of Portland Cement with all reactions.  
 (b) A sample of water on analysis was found to contain the following impurities:

| Impurity        | Mg(NO <sub>3</sub> ) <sub>2</sub> | Mg(HCO <sub>3</sub> ) <sub>2</sub> | MgSO <sub>4</sub> | CaCO <sub>3</sub> | MgCl <sub>2</sub> |
|-----------------|-----------------------------------|------------------------------------|-------------------|-------------------|-------------------|
| Quantity (mg/L) | 29.6                              | 16.8                               | 24.0              | 20.0              | 19.0              |
| Mol.Wt.         | 148                               | 146                                | 120               | 100               | 95                |

Calculate the Temporary and Permanent and Total hardness of sample water in ppm and in  $^{\circ}\text{Fr}$ .

- (c) A standard hard water contains 15 gm of CaCO<sub>3</sub> per liter. 20 ml of this solution required 25ml of EDTA solution on titration. 100 ml of a water sample required 18 ml of same EDTA solution up to end point. The sample after boiling required 12 ml of same EDTA solution. Calculate the Temporary and Permanent hardness of water sample in ppm.