

Roll No.

24005

**B. Tech. 1st Semester "F. Scheme"
Examination – December, 2010**

ENGINEERING CHEMISTRY

Paper : CH-101-F

Time : Three hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting at least one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) Define the terms phase and components with respect to phase rule.
- (b) Give the concept of inhibitors in catalysis.
- (c) State pour point.
- (d) Differentiate between scale and sludge.
- (e) What is microbiological corrosion ?
- (f) Give important applications of PVC.
- (g) Define Beer's Law.

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- (h) What is condensation polymerization, give example ?
- (i) Give the principle of flame photometry.
- (j) What is temporary hardness ? How it can be removed ? 2 × 10

SECTION – A

2. (a) Draw and explain the composition temperature phase diagram of Na_2SO_4 – water system and label it properly. 10
- (b) Explain following with suitable examples :
- (i) Poisoners in catalysis. 4
- (ii) Enzymatic catalysis. 6
3. (a) What is mean by homogeneous and heterogeneous catalysis ? Explain giving suitable examples. 10
- (b) Describe a method to determine eutectic point for a two component system by using cooling curve method. 10

SECTION – B

4. (a) How is water softened by lime-soda process ? Give the reactions involved in this process. 10

- (b) 10 ml water sample requires 10 ml of EDTA. Calculate its hardness. 20 ml of CaCl_2 solution, whose strength is equivalent to 1.75 g of CaCO_3 per litre, required 30 ml of EDTA solution. 10

5. (a) Explain the advantages and disadvantages of the zeolite process for water softening. 10

(b) Write short notes on : 10

- (i) Ion Exchange Process
- (ii) Sedimentation

SECTION - C

6. (a) Give an account of the properties of lubricating oils. 8

(b) Explain the mechanism of the following :

(i) Dry Corrosion 6

(ii) Lubrication 6

7. (a) Why additives are used in lubricants ? Give some examples. 8

(b) Write short notes on the following :

(i) Soil Corrosion 6

(ii) Stress Corrosion 6

SECTION - D

8. (a) What are silicones ? Discuss their important properties and uses. 10
- (b) Explain the principle of IR spectroscopy. What is the importance of finger print region in this techniques? 10
9. (a) Give the preparation, properties and applications of Teflon. 10
- (b) Describe briefly principle and applications of TGA thermal method of analysis. 10