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**B.Tech. 2nd Semester (F. Scheme) Examination,
May-2012**

ENGINEERING CHEMISTRY

Paper - CH-101-F

Time allowed : 3 hours] [Maximum marks : 100

Note : Question No. 1 is compulsory. Attempt four questions from remaining four sections selecting one question from each section. Use of non programmable calculator is allowed.

- 1. (a) Define the system having incongruent melting.
- (b) Define metastable equilibrium.
- (c) Differentiate triple point and eutectic point.
- (d) Define Break-point chlorination.
- (e) Define demineralization of water.
- (f) Describe stress cracking.
- (g) What do you understand by galvanization?
- (h) Describe saponification value of a lubricant.
- (i) Write uses of PVC.
- (j) What do you understand by Blue-shift? 2×10

Section - A

- 2. (a) How is the phase diagram of water helpful in explaining :

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- (i) ice skating
- (ii) Flow of glaciers 5×2
- (b) Explain the kinetics (mechanism) of acid base catalysis. 10
3. (a) Draw and explain the phase diagram of sodium sulphate-water system. 10
- (b) Derive Michaelis-Menton equation for enzyme catalysis. 10

Section - B

4. (a) 100 ml of water sample requires 20 ml N/100 EDTA when titrated using buffer solution of pH 9-10 and EBT indicator, calculate the hardness of water. 10
- (b) What do you understand by desalination of water? Discuss in detail the reverse osmosis process for desalination of sea water with help of neat, clean and labeled diagram. What are its advantages and disadvantages? 10
5. (a) Write short notes on :
- (i) Boiler corrosion
- (ii) Caustic embrittlement 5×2

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- (b) A zeolite softener was 90% exhausted by removing the hardness completely when the 200000 litres of hard water sample passed through it. The exhausted zeolite bed requires 145 litres of 35% NaCl solution for its complete regeneration. Calculate the hardness of water.

10

Section - C

6. (a) Write short notes on :
- (i) Waterline corrosion
 - (ii) Role of sacrificial anode in corrosion control 5×2
- (b) Write short notes on :
- (i) Molybdenum disulphide as solid lubricant
 - (ii) Semi-solid lubricants 5×2
7. (a) Why additives are used in lubricants? Gives some examples of additives, which are commonly used in lubricants. 10
- (b) Write short notes on
- (i) Dry corrosion
 - (ii) Microbial corrosion 5×2

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Section - D

8. (a) Discuss the principle and application of TGA

10

(b) Write short notes on :

(i) Polymer composite

(ii) Buna-S

5×2

9. (a) Write the applications of U.V. and I.R. spectroscopy.

10

(b) Write short notes on :

(i) Ziegler-Natta Catalyst

(ii) Write uses of Teflon and phenol-formaldehyde resin

5×2