B.Tech. (Common for all Branches) 2nd Semester

F. Scheme Examination, May–2015

ENGINEERING CHEMISTRY

Paper–CH-101-F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : (i) ***Question No. 1 is compulsory.***

(ii) Attempt ***four*** *questions from remaining four sections selecting* ***one*** *question from each section.*

(iii) Use of non programmable calculator is allowed.

1. (a) Define the system having incongruent melting. 2×10=20

(b) What are homogeneous and heterogeneous catalysis ?

(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 tinning ?

(h) Describe Iodine value of a lubricant.

(i) Write uses of PF.

(j) What do you understand by Bathochromic shift ?

Section–A

2. (a) Draw and explain the phase diagram of Zn-Mg system. 10

(b) Write an explanatory note on Enzymatic catalysis. 10

3. (a) Draw and explain the phase diagram of H_2O-system. 10

(b) Explain the concepts of promoters, inhibitors and poisoners. 10

Section–B

4. (a) 100 ml of water sample requires 20 ml N/50 H_2SO_4 during titration by using phenolphthalein indicator and 26 ml of same acid by using methyl orange indicator. Calculate the alkalinity of each type in terms of $CaCO_3$ equivalent. 10

(b) What do you understand by demineralization of water ? Discuss in detail the ion-exchange process for demineralization of hard water with help of neat, clean and labeled diagram. 10

5. (a) A zeolite softener was 75% exhausted by removing the hardness completely when the 100000 litres of hard water sample passed through it. The exhausted zeolite bed requires 145 litres of 25% NaCl solution for its complete regeneration. Calculate the hardness of water. 10

(b) Write short notes on :

(i) Caustic embritllement

(ii) Boiler corrosion. 5×2

Section–C

6. (a) Write short notes on :

(i) Role of Proper Designing in corrosion control.

(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 ? Give some examples of additives, which are commonly used in lubricants. 10

(b) Write short notes on :

(i) Soil corrosion

(ii) Pitting corrosion. 5×2

Section–D

8. (a) Discuss the principle and application of DTA. 10

(b) Write short notes on :

(i) Differentiate thermosetting and thermo-plastics.

(ii) Buna-N. 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) Urea-formaldehyde resin. 5×2