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.

 $2 \times 10 = 20$

- (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?

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Section-A

- 2. (a) Draw and explain the phase diagram of Zn-Mg system.
 - (b) Write an explanatory note on Enzymatic catalysis.
- 3. (a) Draw and explain the phase diagram of H₂O-system.
 - (b) Explain the concepts of promoters, inhibitors and poisoners.

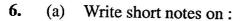
Section-B

- 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 CaCO₃ equivalent.
 - (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.
- 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.

- (b) Write short notes on:
 - (i) Caustic embritllement
 - (ii) Boiler corrosion.

5×2

Section-C



- (i) Role of Proper Designing in corrosion control.
- (ii) Role of sacrificial anode in corrosion control. 5x2
- (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.
 - (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 thermoplastics.
 - (ii) Buna-N.

5×2

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



- (b) Write short notes on:
 - (i) Ziegler-Natta Catalyst
 - (ii) Urea-formaldehyde resin. 5×2