

24005

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 ?

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[P.T.O.]

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

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(b) Write short notes on :

(i) Caustic embrittlement

(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 thermoplastics.

(ii) Buna-N.

5×2

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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

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