

24005

B. Tech. 1st Semester Examination, December-2012

ENGINEERING CHEMISTRY

Paper-CH-101-F

Time allowed : 3 hours]

[Maximum marks : 100

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

1. (a) Define the various terms involved in the phase rule.
- (b) Give the concept of poisoners in catalysis.
- (c) What are various units used for expressing hardness of water ?
- (d) Give important characteristics of drinking water.
- (e) What is Pilling-Bedworth rule ?
- (f) State Flash point.
- (g) Give important applications of teflon.
- (h) Define Lambert-Beer's Law.
- (i) Differentiate between thermoplastic and thermosetting polymers.
- (j) Define microbiological corrosion. 2×10

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Section-A

2. (a) Draw and explain the phase diagram of $\text{Na}_2\text{SO}_4\text{-H}_2\text{O}$ system in detail. 10
- (b) Explain the following with example :
- (i) Triple point
- (ii) Eutectic point. 10
3. (a) Write short notes on following :
- (i) Enzymatic Catalysis
- (ii) Role of Promoters in Catalysis. 5×2
- (b) Explain the phase diagram of carbon dioxide system in detail. 10

Section-B

4. (a) What is meant by 'Alkalinity of water' ? How is it determined experimentally ? 10
- (b) How is the permanent hardness of water determined ? 10
5. (a) What do you mean by softening of water ? Explain lime-soda process in detail. In what respect hot lime-soda process is superior to the cold lime-soda process ? 10

(b) Write short notes on :

(i) Sterilization of water by chlorination

(ii) Reverse Osmosis. 5×2

Section-C

6. (a) Discuss the important factors which influence the rate and extent of corrosion of a metal. 10

(b) Write short notes on :

(i) Electroplating

(ii) Cathodic protection. 5×2

7. (a) Define Lubrication. Discuss the various mechanisms through which it occurs ? 10

(b) Write short notes on :

(i) Cloud point and Pour point

(ii) Additives for lubricants. 5×2

Section-D

8. (a) What are silicones ? How are they prepared ? Discuss their properties and uses. 10

(b) Write short notes on :

(i) Polymeric composites

(ii) Effect of structure on the properties of polymers.

9. (a) What is thermogravimetric analysis ? Describe its principle, technique and applications. 10
- (b) Write the applications of :
- (i) U. V. spectroscopy
 - (ii) I. R. spectroscopy. 5×2