

1E1026

Roll No. _____

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B.Tech. I - Sem.(Main/Back) Exam - Jan-Feb. 2012
106 - Engineering Chemistry-I
(Common to all Branches of Engg.)

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates:

Attempt overall five questions selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. _____ Nil 2. _____ Nil

Unit - I

1. (a) Explain temporary and permanent hardness of water. Discuss various chemical methods for disinfection of water. [4+4=8]
1. (b) What are the characteristics of drinking water, discuss Break Point chlorination in detail. [8]

OR

1. (a) What is EDTA? How it is determined by EDTA method? [8]
1. (b) The standard water was prepared by dissolving 1.0gm of pure and dry CaCO_3 in 1 litre distilled water. 50 ml of this solution required 46 ml of EDTA solution while 50 ml of hard water sample required 20 ml of EDTA solution. Boiled sample of water consumed 10 ml of EDTA solution. Determine the temporary, permanent and total hardness of water in ppm of CaCO_3 equivalents. [8]

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[Contd...]

Unit- II

2. (a) Describe the continuous hot lime-soda method for softening hard water. Also give the chemical reactions involved in lime-soda process. [8]
2. (b) Analysis of water sample gave the following results-

$$\text{Mg}(\text{HCO}_3)_2 = 25.0 \text{ mg/l}$$

$$\text{MgCl}_2 = 15.0 \text{ mg/l}$$

$$\text{CaSO}_4 = 20 \text{ mg/l}$$

$$\text{SiO}_2 = 2.45 \text{ mg/l}$$

$$\text{NaCl} = 2.0 \text{ mg/l}$$

Calculate the amount of lime and soda required for softening 40,000 litres of water. If purity of lime is 80% and soda is 90%. [8]

OR

2. (a) Describe scale and sludge formation in boilers. How are they removed? Discuss in detail. [8]
2. (b) Write short notes on (any two)
- (i) Boiler corrosion
 - (ii) Caustic embrittlement
 - (iii) Zeolite method
 - (iv) Priming and Foaming [4+4=8]

Unit - III

3. (a) Explain classification of polymers with example. [8]
3. (b) Discuss the preparation, properties and application of
- (i) Bakelite and (ii) nylon [4+4=8]

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[Contd...]

OR

3. (a) What are plastics? Distinguish between thermoplastics and thermosetting plastics with suitable examples. [8]
3. (b) Write short notes on (any two)
- (i) Vulcanization of rubbers
 - (ii) Synthetic rubber
 - (iii) Types of polymerization
 - (iv) Constituents of polymers. [4+4=8]

Unit – IV

4. Describe the manufacture of portland cement by rotary kiln technology along with raw material and chemical reactions involved in it. [16]

OR

4. Define glass and its properties. Explain the manufacture of coloured glass with chemical reactions. [16]

Unit – V

5. (a) What are refractories? How they are classified? Give the essential requirement of a good refractory material. [8]
5. (b) Short notes on (any two)
- (i) Seger cone and RUL test
 - (ii) Fire Clay refractories
 - (iii) Silica refractories [4+4=8]

OR

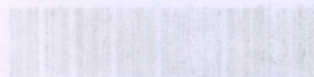
5. (a) Define lubricants? Explain extreme pressure lubrication with suitable

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[Contd...]

example.

[8]

5. (b) Short notes on (any two)

- (i) Viscosity and viscosity index
- (ii) Thick and thin film lubrication
- (iii) Flash and fire point
- (iv) Cloud and pour point.

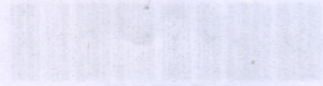
[4+4=8]

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