[EURCH-104A]
B.Tech. Degree Examination

I SEMESTER
(Supplementary)

ENGINEERING CHEMISTRY-I
(B.Tech. for the admitted batches 2012–13 to 14-15 only)
(AE for the admitted batch 2013–14 & 114-15 only)
(Common for B.Tech. regular all branches (except BT) & Aeronautical Engg.)

Time: 3 Hours
Max.Marks: 60

Instructions:
Each Unit carries 12 marks.
Answer all units choosing one question from each unit.
All parts of the unit must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

UNIT-I

1. a) How is hardness of water expressed? 3
    b) Briefly explain the sedimentation process for removal of large suspended particles 4
    c) Calculate the temporary hardness for a sample of water contains the dissolved salts in mg/lit
       Mg(H Co3)2 : 9.0, M9So4-5.6, Mg cl2=4.2, Ca S04 = 12.5,
       Na2So4 = 6.5, Ca(H Co3)2 = 6.8; (moluts Ca Co3 = 100,
       Mg(H Co3)2 : 146, Ca(H Co3)2 – 162 5

OR

2. a) Write about the sources of water 3
    b) Describe the reverse osmosis process with a neat diagram and mention the limitations of this process 5
    c) Explain the use of aluminum sulphate in coagulation process 4

UNIT-II

3. a) Differentiate between scale and sludge? 3
    b) Discuss briefly the boiler corrosion 4
    c) Calculate the amount of lime and soda ash required to soften 50,000 Liters of water having the following composition,
       Ca(HCO3)2 = 8.1ppm, Mg(HCO3)2 = 7.3ppm, CaSO4 as Ca2+ ion = 30ppm, MgSO4 as Mg2+ ion = 12ppm 5
4. a) What is phosphate conditioning?
   b) Explain Priming and Forming. Explain how these boiler troubles are rectified
   c) Calculate the amount of lime required to soften 2500 lit of water containing the following salts:
      \( \text{Mg(HCO}_3\text{)}_2 = 8.1 \text{ mg/lit, } \text{MgSO}_4 = 25 \text{ mg/lit, } \text{CaCl}_2 = 12.9 \text{ mg/lit and } \text{Ca(HCO}_3\text{)}_2 = 15.9 \text{ mg/lit} \)

UNIT – III

5. a) Describe the classification of colloids with suitable examples
   b) Define the terms: (i) adsorption, (ii) adsorbate, (iii) adsorbent
   c) What do you mean by chemical oxidation

OR

6. a) Discuss the characteristics of chemisorptions process
   b) Describe any two methods of preparation of lyophobic metal salts
   c) What are the drawbacks of Freundlich's adsorption isotherm?

UNIT-IV

7. a) Explain the following terms
    i) Functionality of monomer
    ii) Oligomer and polymer
    iii) Copolymer
    b) Explain the cation mechanism involved in addition polymerization of alkenes
    c) Write note on foamed plastics

OR

8. a) Distinguish between thermoplastics and thermosetting resins
    b) Explain the free radical mechanism involved in chain-growth polymerization of alkenes
    c) Describe any two moulding techniques for fabrication of plastics

UNIT-V
9. a) Write the properties and uses of silicon carbide refractories  
   b) Define refractory's? Write a short note on the Refractoriness  
      under load or strength  
   c) Distinguish between white wares, ceramics and glass  

   OR

10. a) Write about the role of C₃S, C₂S, C₃A and C₄AF in the  
      manufacture of cement  
   b) Give essential requirement of a good refractory  
   c) Discuss the characteristics of refractory materials

[2,3,4,5,6,7,8,9,10/1 S/117]