Code: R7100305

R07

B.Tech I Year (R07) Supplementary Examinations December/January 2015/2016

ENGINEERING CHEMISTRY

(Mechanical Engineering)
(For 2008 regular admitted batch only)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) What is meant by sterilization of water? Explain how sterilization of water is carried out by using chlorine and ozone.
   (b) How is hardness of water expressed? What are the various units employed? Explain the inter-conversion.

2 (a) Why is hardware harmful to boiler? Describe the causes and harmful effects of scale formation.
   (b) Calculate the amount of soda and lime required to soften 15,000 liters of water which showed the following analysis: NaCl = 15.5 PPM, KCl = 25 PPM, $Mg(HCO_3)_2$ = 3.30 PPM, CO_2 = 5.5 PPM, $MgSO_4$ = 120 PPM, $CaCl_2$ = 22 PPM, $Ca(HCO_3)_2$ = 15 PPM, suspended matter = 15 PPM, organic impurities = 3.5 PPM.

3 (a) Explain how heterogeneity of metal increases the rate of corrosion.
   (b) What are corrosion inhibitors? Discuss anodic and cathodic inhibitors with examples.

4 (a) Explain any three types of surface preparations.
   (b) Write short notes on phosphate and anodized coatings.

5 (a) Distinguish between addition and condensation polymerization.
   (b) Write the properties and uses of different types of silicones.

6 (a) What are refractories? How important are the properties, refractories under load and thermal conductivity for industrial applications?
   (b) Explain the characteristics and applications for thermal and electrical insulators.

7 (a) Describe the various types of lubrication.
   (b) Write short notes on:
        (i) Cloud point and pour point.
        (ii) Fire and flash point.

8 (a) Compare petrol and diesel oil with respect to:
        (i) Knocking characteristics.
        (ii) Octane number and Cetane number.
   (b) Describe the manufacture of gasoline by Bergius process.

*****