



B.Tech Degree I & II Semester Examination in Marine Engineering, May 2009

MRE 104 ENGINEERING CHEMISTRY

Time : 3 Hours

Maximum Marks : 100

- I. (a) Define hard and soft water. What are the factors causing hardness in water. (7)
 (b) Write a note on , 'Internal Conditioning of Water'. (6)
 (c) What is water softening? Explain the ion exchange method for water softening. (7)
- OR**
- II. (a) What are the causes of air pollution? What are the methods to prevent air pollution? (6)
 (b) Write a note on 'External Conditioning of Water'. (7)
 (c) Explain Scale and Sludge formation in boilers. (7)
- III. (a) Define Corrosion. What are the basic types of Corrosion? Describe the various factors that influence Corrosion. (6)
 (b) How can corrosion be controlled by cathodic protection and anodic protection. (8)
 (c) What do you mean by galvanic protection? Explain. (6)
- OR**
- IV. (a) Explain the different theories of Corrosion. (8)
 (b) What are the properties and functions of ingredients present in points? (6)
 (c) Write short notes on : (6)
 (i) tinning (ii) phosphate coating
- V. (a) Derive Nerst Equation. (7)
 (b) Describe a Standard hydrogen electrode. How will you use it in the determination of standard electrode potential of a Z_n/Z_n^{2+} electrode. (7)
 (c) How does the pH Of a solution determined. (6)
- OR**
- VI. (a) Give the working of hydrogen-oxygen fuel cell. (6)
 (b) Explain the working of Edison cell and Laclanche cell. (8)
 (c) Write short notes on : (6)
 (i) Fuel Cell (ii) Potentiometric titrations
- VII. (a) Define (i) Gross calorific value (ii) Net calorific value (6)
 How will you determine the calorific value of a fuel by using Bomb Calorimeter? (8)
 (b) Explain the mechanism of lubrication. (6)
 (c) Write short note on : (6)
 (i) Cetane number (ii) Producer gas
- OR**
- VIII. (a) What are the classification of coal? Explain proximate analysis of coal. (7)
 (b) Write notes on : (6)
 (i) Solid lubricant (ii) Reforming
 (c) Explain the manufacture of coke by Otto Hoffmen's byproduct oven method. (7)
- IX. (a) How are higher polymers classified? (5)
 (b) Write a note on vulcanization of rubber. (6)
 (c) Write notes on: (9)
 (i) Amino resin (ii) Thiokols
 (iii) Silicones
- OR**
- X. (a) Distinguish between compression moulding and extrusion moulding. (6)
 (b) What are Nylons? How are they prepared? What are their uses? (7)
 (d) Write short notes on : (7)
 (i) Phenol – formaldehyde resins
 (ii) PET.