



***B.Tech. Degree I & II Semester Supplementary Examination in  
Marine Engineering May 2014***

**MRE 104 ENGINEERING CHEMISTRY**

Time : 3 Hours

Maximum Marks : 100

(5 x 20 =100)

- I. (a) Define hardness of water. Describe the different types of hardness. (8)  
 (b) What are boiler scales? How it can be prevented? (8)  
 (c) What is meant by desalination of water? Give one method. (4)
- OR**
- II. (a) What are ion exchange resins? How will you purify water using resins? What are its advantages? (8)  
 (b) How is hardness of water estimated? (8)  
 (c) Explain the various steps in domestic water treatment. (4)
- III. (a) Define corrosion. Explain factors which influence corrosion. (8)  
 (b) Explain sacrificial anodic protection method of controlling corrosion. (8)  
 (c) Explain pitting corrosion. (4)
- OR**
- IV. (a) Outline the methods available for the application of metallic coating. (8)  
 (b) Differentiate between paint, varnish, enamel and laequer. (8)  
 (c) Write notes on electrode deposition. (4)
- V. (a) What is single electrode potential? Derive Nemst's equation for single electrode potential. (8)  
 (b) Describe the working of hydrogen-oxygen fuel cell. (8)  
 (c) How pH can be determined using calomel electrode? (4)
- OR**
- VI. (a) What are secondary cells? Describe the construction of one secondary cell. Write the cell reaction. (8)  
 (b) Explain the working of a glass electrode. What are its advantages and disadvantages? (8)  
 (c) What are concentration cells? (4)
- VII. (a) Define calorific value of a fuel. Explain Bomb calorimeter to find calorific value of a fuel. (8)  
 (b) Explain cracking, reforming, knocking and cetane number. (8)  
 (c) Differentiate between LPG and Natural gas. (4)
- OR**
- VIII. (a) Describe proximate analysis of coal. What is the significance of this analysis. (8)  
 (b) Explain theories of friction and mechanism of lubrication. (8)  
 (c) Explain synthetic lubricant and grease. (4)
- IX. (a) Explain with examples addition and condensation polymerization. (8)  
 (b) Differentiate between homopolymer and co-polymer. (8)  
 (c) How the following compounds can be prepared urea formaldehyde resin, nylon. (4)
- OR**
- X. (a) Differentiate between thermoplastic and thermosetting plastic. (8)  
 (b) Explain any three moulding methods for plastic. (8)  
 (c) Write notes on polyurethane and silicon rubbers. (4)