

B. Tech Degree I & II Semester Examination in Marine Engineering, June 2010

MRE 104 ENGINEERING CHEMISTRY

Time : 3 Hours

Maximum Marks : 100

- I. a. Define hardness of water. Explain hot lime soda process for purification of water. (8)
 b. Define desalination. Describe electro dialysis method of desalination with a neat diagram. (8)
 c. Write a note on reverse osmosis. (4)
- OR**
- II. a. What are ion exchange resins? How will you purify water by using resins? What are the advantages of this method over other methods? (8)
 b. What causes scale formation in boilers? What are the internal treatments required for prevention of scale formation in boilers? (8)
 c. Write a note on caustic embrittlement. (4)
- III. a. Define calorific value of a fuel. Explain the bomb calorimeter method to find the calorific value of a fuel. (8)
 b. Describe proximate analysis of coal. What is the significance of this analysis? (8)
 c. What is synthetic petrol? Explain. (4)
- OR**
- IV. a. What is cracking of petroleum? Describe the various methods used for cracking of petroleum. (8)
 b. What are the requisites of metallurgical coke? (8)
 c. Compare solid fuels with gaseous fuels. (4)
- V. a. Mention eight unique properties of plastics. (8)
 b. Briefly explain any three moulding methods for plastics. (8)
 c. Explain with examples, addition and condensation polymerization. (4)
- OR**
- VI. a. Explain briefly the process of compounding of rubber. (8)
 b. Describe vulcanisation. What are the advantages of vulcanisation? (8)
 c. Write the preparation, important properties and uses of BUNA-S and BUNA-N. (4)
- VII. a. What are fuel cells? Describe the construction and working of Hydrogen – oxygen fuel cell. (8)
 b. What is pH? How is pH of an electrolyte determined with hydrogen electrode? (8)
 c. Explain the different application of EMF series. (4)
- OR**
- VIII. a. What is single electrode potential? Derive Nernst's equation for single electrode potential. (8)
 b. What are secondary cells? Describe the construction of one secondary cell. Write the cell reactions and mention its applications. (8)
 c. Explain reversible and irreversible cells with examples. (4)
- IX. a. Define corrosion. Explain the factors which influence corrosion. (8)
 b. Discuss cathodic and anodic protection for controlling corrosion. Mention their merits and demerits. (8)
 c. Explain briefly: (i) Pitting corrosion (ii) Stress corrosion. (4)
- OR**
- X. a. Explain electro chemical corrosion with mechanism. (8)
 b. What is varnish? What are the constituents of varnishes? Discuss their functions? (8)
 c. Briefly explain the main characteristics of enamels. (4)