

B. Tech Degree I & II Semester Examination in Marine Engineering June 2012

MRE 104 ENGINEERING CHEMISTRY

Time : 3 Hours

Maximum Marks : 100

- I. (a) Explain degree of hardness and its determination by EDTA method. (8)
 (b) Describe water softening by permubite process. (8)
 (c) Explain BOD. (4)
- OR**
- II. (a) Define desalination. Describe electro dialysis method of desalination with a neat diagram. (8)
 (b) Explain the internal conditioning of boiler feed water. (8)
 (c) Write a note on reverse osmosis. (4)
- III. (a) Define corrossion and explain different types of corrossion. (8)
 (b) Describe the process of galvanising and anodising. (8)
 (c) Explain the cthodic protection method of corrossion control. (4)
- OR**
- IV. (a) Explain the factors causing corrossion. (8)
 (b) Discuss the theories of corrossion giving reactions involved. (8)
 (c) Write short notes on: (4)
 (i) Waterline corrossion
 (ii) Stress corrossion
- V. (a) What are secondary cells? Describe the construction and working of lead acid storage cell with equations. (8)
 (b) What are concentration cells? Explain the working of the concentration cell and derive an expression for the EMF of the cell. (8)
 (c) A hydrogen electrode is immersed in a solution of pH = 3.5 and other half cell is SHE. Calculate the EMF of the cell, if the two half cells are connected by a salt bridge. (4)
- OR**
- VI. (a) Explain the working of Weston-cadmium cell with a neat diagram and equations. (8)
 (b) What are potentiometric titrations? Explain their applications. (8)
 (c) What is the single electrode potential of a half-cell for zinc electrode dipping in a 0.01 M Z_nSO_4 solution at 28°C? Standard electrode potential of Z_n is - 0.763V. (4)
- VII. (a) Explain the different properties of lubricants. (8)
 (b) Discuss briefly the mechanism of lubrication. (8)
 (c) Write short notes on: (4)
 (i) Synthetic lubricants
 (ii) Reforming
- OR**
- VIII. (a) Explain with example, the characteristics and composition of solid propellants. (8)
 (b) Explain the moulding processes of polymers. (8)
 (c) Write short notes on: (4)
 (i) Octane number
 (ii) Cetane number
- IX. (a) How is petroleum processed? What are its fractions? What are their uses? (8)
 (b) Define calorific value of a fuel and how can it be determined? (8)
 (c) Write a note on gaseous fuels. (4)
- OR**
- X. (a) How are polymers classified? Explain with examples. (8)
 (b) What are Nylons? How are they prepared? What are their uses? (8)
 (c) Explain the structure of natural rubber. (4)