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***B.Tech. Degree I & II Semester Examination in
Marine Engineering May 2019***

**MRE 1104 ENGINEERING CHEMISTRY
(2013 Scheme)**

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) Describe the estimation of hardness of water by EDTA method. (7)
 (b) Describe desalination of sea water by electro dialysis process. (6)
 (c) Describe lime-soda process. What are its advantages? (7)
- OR**
- II. (a) Explain estimation of hardness of water by soap titration method. (7)
 (b) Explain ion exchange method of demineralization of water. (6)
 (c) Define pollution. What are the causes of air pollution? What are the methods of controlling air pollution? (7)
- III. (a) Describe measurement of EMF by Poggendorff method. (7)
 (b) Derive Nernst's equation. (6)
 (c) Explain standard hydrogen electrode. How is it used to measure hydrogen ion concentration? (7)
- OR**
- IV. (a) What are the characteristics of ionic, covalent, molecular and metallic solids? (8)
 (b) What are the different types of semi-conductors and high temperature superconductors? (6)
 (c) Write notes on (i) Liquid crystal display (6)
 (ii) fullerenes
- V. (a) Explain chemical corrosion with suitable example. (7)
 (b) Explain six important factors favouring corrosion. (6)
 (c) Explain sacrificial anode protection and impressed current cathodic protection. (7)
- OR**
- VI. (a) Describe electrochemical theory of corrosion. (7)
 (b) Write notes on: (i) Enamels (ii) Lacquers (iii) Special Paints. (6)
 (c) Describe: (i) Galvanization (ii) Electroplating. (7)
- VII. (a) Write the method of determination of calorific value of solid fuel. (7)
 (b) What is producer gas? How is it manufactured? What are its composition and uses? (6)
 (c) Discuss proximate analysis of coal. What are its importance? (7)
- OR**
- VIII. (a) Describe refining of crude oil. What are the various fractions and uses? (7)
 (b) Explain carbonization of coal. Write a method of manufacture of coke. (6)
 (c) Write notes on: (i) Nuclear Fission (ii) Nuclear Fusion. (7)

(P.T.O.)

- IX. (a) Describe (i) Extrusion Moulding (ii) Compression moulding. (6)
(b) Write the method of preparation, properties and uses of (i) Poly Styrene (9)
(ii) Nylon 6, 6 (iii) Terylene.
(c) Write notes on (i) Vulcanization of rubber. (5)
(ii) Compounding of high polymers.

OR

- X. (a) Describe (i) Injection Moulding (ii) Transfer Moulding. (6)
(b) Preparation, properties and uses of (i) Neoprene (ii) Polyurethane (9)
(iii) Buna rubbers.
(c) Write notes on the following giving examples: (5)
(i) Thermoplastics (ii) Thermo setting plastics
