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***B.Tech. Degree I& II Semester Examination in  
Marine Engineering May 2016***

**MRE 1104 ENGINEERING CHEMISTRY**

Time : 3 Hours

Maximum Marks : 100

(5 × 20 = 100)

- I. (a) Describe Ion exchange method of softening water. (6)  
 (b) Describe the estimation of hardness of water by EDTA method. (7)  
 (c) What are the causes of air pollution? Explain four methods to prevent it. (7)
- OR**
- II. (a) Describe the desalination of sea water by electro dialysis. (7)  
 (b) Describe five methods of internal treatment of hard water in boiler. (5)  
 (c) What are the measures to be taken to purify river water to drinking water? (8)
- III. (a) Describe the setting and working of Saturated Calomel Electrode and how it is used to find pH of the given solution. (8)  
 (b) Explain how the single electrode potential is determined by S H E. (6)  
 (c) Describe the setting and working of Weston cadmium cell. (6)
- OR**
- IV. (a) What are the important stoichiometric and non-stoichiometric defects in crystals? Explain with example. (8)  
 (b) Describe Liquid Crystal Display. (6)  
 (c) Describe poggendorff method of EMF measurement. (6)
- V. (a) What are the factors favoring corrosion? (7)  
 (b) Describe sacrificial anode protection and impressed current cathodic protection. (7)  
 (c) Write notes on (i) Electro plating (ii) Hot dipping. (6)
- OR**
- VI. (a) What are the important ingredients in paints? What are their functions and properties? (7)  
 (b) Describe the Wet and Dry theories of Corrosion. (7)  
 (c) Write notes on (i) Varnishes (ii) Enamels. (6)
- VII. (a) Describe the method of determination of calorific value of a solid fuel. (7)  
 (b) What is producer gas? How can it be manufactured? What are its composition? Mention two uses. (7)  
 (c) Describe a method of synthesis of petrol. (6)
- OR**
- VIII. (a) Describe the refining process of petroleum. Name four important fractions. What are their uses? (7)  
 (b) Explain the terms: Nuclear energy, Nuclear fission, Nuclear fusion. (6)  
 (c) What is water gas? What are its composition? How is it manufactured? (7)

(P.T.O.)

- IX. (a) Write the method of preparation properties and uses of (i) Nylons (6)  
(ii) Terylene (iii) Teflon.
- (b) Describe any two moulding techniques of high polymers. What are the (7)  
important additives used?
- (c) What are the differences between addition polymers and condensation (7)  
polymers?

**OR**

- X. (a) Describe the processing of Rubber latex. What is its structure (Rubber) (6)
- (b) Describe the method of production of: (9)  
(i) Bakelite (ii) Urea formaldehyde (iii) Silicons.
- (c) How are the following prepared? (i) Buna Rubbers (ii) Butyl rubbers. (5)