BT-MRE-I & II(S)-05.16-0761 Reg. No. | | | | | | | | |

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

MRE 104 ENGINEERING CHEMISTRY

Time: 3 Hours Maximum Marks: 100

(5 × 20 =100)

I. (a) Describe cold and hot lime soda process. (7)
(b) Describe any five methods of internal treatment of hard water. (7)
(c) What is sewage? How does it pollute water? Explain the terms BOD and COD. (6)

OR

II. (a) Describe Ion-exchange method of softening hard water. (6)
(b) Describe any five disadvantages of using hard water in steam generation in boiler. (5)
(c) "Air pollution is caused by (i) gases (ii) dust (iii) deforestation (iv) internal combustion engines". Explain with suitable examples. (9)

III. (a) "Nature of metal and nature of environment influences metallic corrosion" substantiate with four specific example each. (8)
(b) Hot dipping, electro plating, metal cladding are certain methods to prevent corrosion. Explain with specific example. (6)
(c) Explain (i) sacrificial anode method (ii) impressed current cathodic protection, with example. (6)

OR

IV. (a) Explain electro chemical theory of corrosion. (6)
(b) What are paints? What are its constituents? What are their functions and properties? (8)
(c) Explain the role of varnishes and enamels as organic coatings to prevent corrosion. (6)

V. (a) Derive Nernst equation for electrode potentials. How is it determined experimentally? (EMF) (8)
(b) Define concentration cells. Derive an expression for its E.M.F. (6)
(c) Explain Pb-Acid storage cell. What are its changes in charging and discharging? (6)

OR

VI. (a) Explain the setting and working of S.H.E. How is it used to determine the pH of a solution? (8)
(b) How will you determine, by an experiment the E.M.F. of a cell, (6)
$Z_n \left| Z^{2+}_{n(1M)} \right\| Cu^{2+}_{(1M)} \left| Cu \right.$?
(c) Describe the setting and working of (i) Weston cadmium cell (ii) Edisson cell. (6)

(P.T.O.)

VII. (a) Differentiate HCV and LCV. Write a method to determine the calorific value of a gaseous fuel.

(b) Define the terms, lubrication and lubricant. What are the mechanisms of lubrication?

(c) What is water gas? How is it manufactured? What are its composition? What are its uses?

OR

VIII. (a) Describe the refining process of petroleum. What are the important fractions and their uses?

(b) Describe any five characteristic properties of lubricants.

(c) What is producer gas? How is it manufactured? What are its composition? How does it differ from water gas?

IX. (a) Write the methods of preparation, properties and uses of (i) polyethylene (ii) Teflon (iii) Backelite.

(b) Describe Injection moulding and Compression moulding of plastics.

(c) What are the compounding materials used in hipolymers?

OR

X. (a) Write the methods of preparation, properties and uses of (i) Nylon (ii) Terylene (iii) Polystyrene.

(b) What is Latex? How is it processed? Describe vulcanization of rubber.

(c) How are the following prepared? (i) Poly urethane (ii) PVC (iii) Neoprene.

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