

COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

B.TECH. DEGREE I & II SEMESTER SUPPLEMENTARY EXAMINATION IN MARINE ENGINEERING JUNE 2020

MRE 1104 ENGINEERING CHEMISTRY (2013 Scheme)

Time: 3 hrs [30 Minutes for Answering and Scanning/Uploading the page of the Answer Sheet per module]
Max. Marks: 70 (14 per module)

INSTRUCTIONS

1. You have to be available in Google Meet on demand by the faculty.
2. You have to share your '**live location**' to the faculty before uploading the answer sheet.
3. You have to answer only one question per module.
4. Answer may not exceed one page of an A4 size paper in a standard handwriting, as far as possible.
5. If at all an answer goes beyond one page, (due to your handwriting) another page can also be used. In such a situation, the page number should be given as 1/2, 2/2.
6. You have to put dated signature along with Register Number, Subject Code, Module/Group Number (as given in the Question Paper) in each page.
7. You have to put the Question Number correctly.
8. After answering the question, you have to scan and upload the answer page.

MODULE - I

(Answer **ANY ONE** question)

- I(1). (a) Define hardness of water. Describe the different types of hardness. (4)
(b) What are boiler scales? Mention their ill effects. (5)
(c) What are the causes of air pollution? Describe any three methods to prevent air pollution. (5)

OR

- I(2). (a) Calculate amount of temporary hardness and permanent hardness of a water sample which contains following impurities: (5)
Ca (HCO₃)₂ = 10 mg/l, Mg(HCO₃)₂ = 10 mg/l, Mg SO₄ = 14 mg/l,
CaSO₄ = 12 mg/l.
(b) Describe the process of reverse osmosis. (5)
(c) Differentiate between BOD and COD. (4)

MODULE - II

(Answer *ANY ONE* question)

- II(1). (a) What is a reference Electrode? Explain with one example. (6)
(b) Discuss the construction and working of Weston cadmium cell. (8)

OR

- II(2). (a) Explain the characteristic features of Fullerenes. (4)
(b) Differentiate between Frenkel and Shottky defects (5)
(c) Write a brief note on super conductors. (5)

MODULE - III

(Answer *ANY ONE* question)

- III(1). (a) What are the constituents of paints ? What are their functions? (8)
(b) Write any four methods to prevent corrosion. (6)

OR

- III(2). (a) Discuss any four factors that influence corrosion. (4)
(b) Write notes on: (i) electroplating (ii) Hot dipping. (6)
(c) Differentiate between Galvanization and Tinning. (4)

MODULE - IV

(Answer *ANY ONE* question)

- IV(1). (a) Define gross and net calorific values of fuels and give their relationship. (6)
(b) Distinguish between producer gas and water gas. (4)
(c) Write notes on: (i) Octane number (ii) Cetane number. (4)

OR

- IV(2). (a) What are the characteristics of a good fuel? (4)
(b) Write notes on: (i) nuclear fission (ii) nuclear fusion. (5)
(c) The temperature of 1000g. of water was increased from 26.2°C to 29.8°C on burning 0.80 g of a solid fuel in a bomb calorimeter. Water equivalent of calorimeter is 385g. If the fuel contains 0.7% hydrogen calculate its gross and net calorific values. (5)

MODULE - V

(Answer *ANY ONE* question)

- V(1). (a) What are the main differences between addition and condensation polymerization? Give an example in each case. (4)
(b) Distinguish between homopolymer and copolymer. (4)
(c) Give the method of preparation, properties and important uses of the following polymers. (i) Polystyrene (ii) PVC (iii) Phenol formaldehyde resin (6)

OR

- V(2). (a) What are the differences between thermoplastics and thermosetting plastics? Give examples. (4)

- (b) What is vulcanization of rubber? Explain with equation. (4)
- (c) Write the preparation, important properties and uses of BUNA-S and BUNA-N. (6)
