

B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2020 (Held during April, 2021)

First Semester

CY18152- Chemistry for Marine Engineering

Marine Engineering

(Regulation 2018)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. What percentage of earth's water is fresh?
 - A. 10%
 - B. 3%
 - C. 20%
 - D. 40%
2. Corrosion due to the formation of cavities around the metal is called as the _____
 - A. Pitting corrosion
 - B. Soil corrosion
 - C. Water line corrosion
 - D. Galvanic corrosion
3. Both temporary and permanent hardness of water can be removed on boiling water with
 - A. Calcium hydroxide
 - B. Sodium carbonate
 - C. Calcium oxide
 - D. Calcium carbonate
4. The main purpose of CNTs in fuel cells is _____
 - A. Production of energy
 - B. Active medium
 - C. Catalyst
 - D. Storage
5. Define boiler feed water and its requirements.
6. What is meant by dezincification?
7. Define degree French.
8. Mention any two advantages of Ni-Cd battery.

PART B - (4 X 16 = 64 marks)

- 09 (a) (i) Discuss the classification of water sample and their impurities. (8)
(ii) Briefly explain the troubles arising due to scale formation (8)

(OR)

- (b) (i) Explain the prevention of scale formation in boilers. (8)
(ii) How are the internal treatment of boiler water carried out? (8)
10. (a) (i) When does the electrochemical corrosion occur? Write an explanatory note on the mechanism of electrochemical corrosion. (8)
(ii) Explain the various factors influencing corrosion. (8)
- (OR)**
- (b) (i) Suggest any two methods for corrosion control and explain them with neat diagram? (8)
(ii) Comment on the corrosion fatigue and stress corrosion. (8)
11. (a) What are the various external treatment methods available for the softening of hard water? Describe the Cold Lime-Soda process with all the functions of lime and soda. (16)
- (OR)**
- (b) (i) Discuss the tests for the estimation of partial and total alkalinity. (8)
(ii) Discuss the effects of salts and gases in feed water. (8)
12. (a) (i) A water sample has the following composition: $\text{Ca}(\text{HCO}_3)_2 = 16.2 \text{ mg/L}$, $\text{Mg}(\text{HCO}_3)_2 = 7.3 \text{ mg/L}$, $\text{MgCl}_2 = 9.5 \text{ mg/L}$, $\text{CaSO}_4 = 13.6 \text{ mg/L}$, $\text{MgSO}_4 = 3.5 \text{ mg/L}$, $\text{NaCl} = 1.3 \text{ mg/L}$ and $\text{K}_2\text{CO}_3 = 2.9 \text{ mg/L}$. Identify the types of hardness present in the sample. Calculate the total hardness of the water sample.
(ii) With a suitable diagram describe the Permutit process of softening of hard water. Write advantages and limitations of Permutit process.
- (OR)**
- (b) (i) Describe the construction and working of a Lead Acid Battery with reactions occurring during charging and discharging and write a few applications. (8)
(ii) Elaborate the construction and the working principle of hydrogen-oxygen fuel cell with reactions and neat diagram. (8)