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B.E./B.Tech. Degree Examinations, December 2016

First Semester

CY16152 – CHEMISTRY FOR MARINE ENGINEERING

(Marine Engineering)

(Regulation 2016)

QP Code:997235

Time: Three hours

Maximum : 100 marks

Answer **ALL** Questions

PART A - (10 X 2 = 20 marks)

1. pH of rain water is less than 7, Justify.
2. Sea water is the most impure form of natural water. Why?
3. What is meant by dezincification?
4. What type of corrosion does take place when steel screw is used in copper plumbing?
5. Write a short note on salinometer.
6. Define reverse osmosis.
7. How would you detect whether the given water is soft or hard?
8. What is the function of coagulants in treatment of water?
9. Compare batteries and fuel cells.
10. List out any two uses of gold nanoparticles.

PART B - (5 X16 = 80 marks)

11. (a) How are scales formed in boilers? Discuss the mechanism of CaSO_4 scale formation. Explain the preventive measures applied to eliminate scale and their significance. **(16)**

(OR)

- (b) Explain in detail about the types of impurities present in water and their characteristic properties. **(16)**
12. (a) (i) Define corrosion of metal and describe the mechanism of electrochemical corrosion. **(10)**
- (ii) Write the mechanism of stress corrosion. **(6)**

(OR)

- (b) (i) How is deaeration of water carried out? Explain in detail. (8)
(ii) Explain pitting corrosion with a neat diagram. (8)
13. (a) (i) What is desalination and explain reverse osmosis process. (8)
(ii) Define alkalinity. How will you estimate the alkalinity of water? (8)

(OR)

- (b) (i) Explain the electro dialysis process of water treatment. (8)
(ii) Discuss the causes and prevention of priming and foaming. (8)
14. (a) (i) Explain the estimation of hardness of water by EDTA method. (8)
(ii) Calculate the temporary and permanent hardness of water containing
 $\text{CaCl}_2 = 22.2 \text{ mg/l}$, $\text{Mg}(\text{HCO}_3)_2 = 14.6 \text{ mg/l}$, $\text{Ca}(\text{HCO}_3)_2 = 32.4 \text{ mg/l}$,
 $\text{MgSO}_4 = 24.0 \text{ mg/l}$ (Atomic weights of Ca = 40, Mg = 24, S = 32,
Cl = 35.5 and O = 16) (8)

(OR)

- (b) (i) How will you estimate the dissolved oxygen content of a water sample? (8)
(ii) Give the specification for water to be used in tubular boilers. (8)
15. (a) (i) Give an account of carbon nano tube and its applications. (8)
(ii) Write the principle of working of $\text{H}_2 - \text{O}_2$ fuel cells (8)

(OR)

- (b) (i) Write detailed notes on the principle and working of solar cells. (8)
(ii) Discuss the working principle of Li ion battery. (8)