Code: 15A51101 **R15**

B.Tech I Year II Semester (R15) Regular & Supplementary Examinations May 2018

ENGINEERING CHEMISTRY

(Common to CE, EEE and CSE)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Boiling of water removes temporary hardness. Why? Write the reactions.
(b) What is Calgon conditioning?
(c) Define functionality of a monomer. What is the functionality of vinyl chloride?
(d) Write the monomers of Bakelite.
(e) Write the cell reaction of lead-acid battery during charging process.
(f) What is electroless plating?
(g) Distinguish between gross and net calorific values.
(h) Write the compositions of water gas and producer gas.
(i) Define setting and hardening of cement.
(j) What are greases?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain the methods of estimation of permanent, temporary and total hardness of water by EDTA method.

OR

3 (a) Describe the process of reverse osmosis for purification of water.
(b) The hardness of 50,000 liters of a water sample was removed by passing through a zeolite which required 200 liters of Nacl solution containing 120 g per litre of Nacl for regeneration. Calculate the hardness of water.

UNIT – II

4 Write a brief note on preparation, properties and uses of silicones.

OR

5 Providing an example for each, discuss the mechanism involved in free radical polymerization and anionic polymerization.

UNIT – III

6 Derive Nernst's equation. Calculate the potential of Daniel cell at 30^{o}C when the concentration of Zinc and Copper electrodes are 0.5M and 0.04M respectively. The standard potential of the cell is 1.10 V.

OR

7 Define corrosion. Explain the process of rust formation using electrochemical theory. What is the effect of dissolved oxygen in this process?

UNIT – IV

8 How metallurgical coke is manufactured by Otto Hoffman's by-product oven?

OR

9 (a) What is power alcohol? Mention its advantages and disadvantages.
(b) Calculate the minimum amount of oxygen and air by weight required for complete combustion of 1 kg of coal which have the following percentage composition by weight: C = 75; H = 5.2; O = 12.1; N = 3.2 and ash 4.5.

UNIT – V

10 Write a short note on:

(a) Carbon nanotubes.
(b) Solid lubricants.

OR

11 Briefly discuss the properties of refractories.

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