Code: 15A51101 **R15**

B.Tech I Year II Semester (R15) Supplementary Examinations December 2016

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) Explain the principle of reverse Osmosis for desalination of water.

(b) What is the principle in estimation of hardness by EDTA method?

(c) What are ion exchange resins?

(d) How does Buna-S differ from Buna-N?

(e) What are inorganic polymers? Give two examples.

(f) Explain the working principle of $H_2 – O_2$ fuel cells.

(g) What are the main constituents of coal? Explain their significance.

(h) Define the term cetane number. Mention one additive to improve cetane rating.

(i) What are refractory materials? Give one example.

(j) What are the characteristics of a good lubricant?

PART – B

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

UNIT – I

2 Discuss the following process:

(a) Priming and foaming.

(b) Caustic embrittlement.

(c) Phosphate conditioning.

OR

3 A water sample on analysis was found to contain the following: $Mg(HCO_3)_2$ = 22.5 ppm, $CaSO_4$ = 7.5 ppm, NaCl = 3.6 ppm. Calculate the permanent and temporary hardness.

UNIT – II

4 What is Bakelite? Explain the manufacturing process and mention its uses.

OR

5 Explain the procedures used in the processing of natural rubber.

UNIT – III

6 What is Cathodic protection? How is it achieved by use of a sacrificial anode?

OR

7 Explain in detail about:

(a) Ni – Cd.

(b) Lithium ion batteries and their significant uses.

UNIT – IV

8 Calculate the volume of air required for the complete combustion of 1 m^3 of the gaseous fuel having the following composition by volume: H_2 = 50%, CH_4 = 36%, N_2 = 15%, CO = 6%, C_2H_4 = 4% and H_2O vapor = 2.5%.

OR

9 Discuss the Fischer Tropsch synthesis with a neat diagram.

UNIT – V

10 Discuss the process of manufacturing of Portland cement with the help a diagram.

OR

11 Name two important solid lubricants and discuss their lubricating actions.

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