B.Tech I Year (R13) Supplementary Examinations June 2016

ENGINEERING CHEMISTRY

(Common to all branches)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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

(a) Write principle reactions of methanol – oxygen fuel cells.
(b) What is electroless plating? Give one example.
(c) Discuss the free radical polymerization mechanism.
(d) Write two applications of conducting polymers.
(e) Define octane number. What is its significance?
(f) What is the composition of producer gas?
(g) What is initial and final setting time of cement?
(h) Write a brief note on rocket propellants.
(i) Explain Ozonation principle in water treatment.
(j) Define scale and sludge.

PART – B

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

UNIT - I

2 (a) What are rechargeable batteries?
(b) Explain the working principle of Li-ion batteries.

OR

3 (a) What is corrosion? Discuss the factors influencing the corrosion.
(b) With a neat sketch explain the mechanism of oxidation corrosion.

UNIT - II

4 Explain different types of polymerization process with suitable examples.

OR

5 Discuss the major differences between thermoplastics and thermosetting plastics.

UNIT - III

6 A sample of coal contains 87% Carbon, 2% Hydrogen, 1% Oxygen, 1% Sulfur and ash. Calculate the theoretical weight and volume of air (at NTP) required for complete combustion of 1 kg of the sample of coal.

OR

7 How the calorific value of a fuel is determined by Bomb calorimeter? Explain with the help of the diagram.

UNIT - IV

8 (a) Define flash and fire points.
(b) Discuss the important functions of lubricants.

OR

9 Define refractories. What are the characteristics of a good refractory?

UNIT - V

10 A sample of water on analysis has been found to contain the following in ppm: $Ca(HCO_3)_2$ = 4.86, $Mg(HCO_3)_2$ = 5.84, $CaSO_4$ = 6.80, $MgSO_4$ = 8.40. Calculate the temporary and permanent hardness of the water (Atomic weights are Ca = 40, Mg = 24, C = 12, S = 32, O=16, H = 1).

OR

11 Discuss the principle and processes involved in determination of:

(a) Biological.
(b) Chemical oxygen demands.