

B.Tech I Year (R13) Supplementary Examinations June 2017

ENGINEERING CHEMISTRY

(Common to all branches)

Time: 3 hours

Max. Marks: 70

PART - A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Explain the construction of hydrogen – oxygen fuel cell.
 - Calculate the emf of a Daniel cell at 25°C when the concentration of ZnSO_4 and CuSO_4 are 0.001 M and 0.1 M, respectively. The standard potential of cell is 1.2 volts.
 - What is meant by compounding of rubber?
 - Give the representative formula and two important applications of PVC.
 - What is meant by octane number of a gasoline?
 - Calculate the gross and net calorific value of coal having the following compositions. C = 85% H = 8%, S = 1%, N = 2%, ash = 4% and latent heat of steam = 587 cal/g.
 - Explain the mechanism of setting and hardening of cement.
 - What is a rocket propellant? Discuss briefly the requirements for the selection of a propellant.
 - How can scale formation be prevented by Calgon conditioning?
 - Write a short note on caustic embrittlement.

PART - B

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

UNIT - I

- 2 Discuss with a neat sketch, the construction and working principle of:
- Lead-acid battery.
 - Methanol – oxygen fuel cell.

OR

- 3
- Explain various measures available for controlling corrosion.
 - What is cathodic protection? Explain sacrificial anode method.

UNIT - II

- 4 Discuss the preparation procedure and engineering applications of Buna-S and Buna-N rubbers.

OR

- 5 Discuss the preparation procedure and applications of conducting polymers.

UNIT - III

- 6 What is power alcohol? Discuss the manufacturing process of power alcohol.

OR

- 7 A sample of coal have the following percentage composition C = 75%, H = 5.2%, O = 12%, N = 3.2% and ash = 4.5%. Calculate the minimum amount of air necessary for complete combustion of 1 kg of coal.

UNIT - IV

- 8
- Discuss the principle underlying lubrication.
 - Write a note on functions and applications of lubricants.

OR

- 9 What are refractories? Write a note on essential requirements of good refracting material.

UNIT - V

- 10 Give a detailed note on reverse osmosis and electrolysis.

OR

- 11 A sample of 50 mL water consumed 15 mL of 0.01 M EDTA before boiling and 5 mL of the same EDTA after boiling. Calculate the degree of hardness and permanent hardness.
