

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)
- Write principle reactions of methanol – oxygen fuel cells.
 - What is electroless plating? Give one example.
 - Discuss the free radical polymerization mechanism.
 - Write two applications of conducting polymers.
 - Define octane number. What is its significance?
 - What is the composition of producer gas?
 - What is initial and final setting time of cement?
 - Write a brief note on rocket propellants.
 - Explain Ozonation principle in water treatment.
 - 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: $\text{Ca}(\text{HCO}_3)_2 = 4.86$, $\text{Mg}(\text{HCO}_3)_2 = 5.84$, $\text{CaSO}_4 = 6.80$, $\text{MgSO}_4 = 8.40$. 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:
- Biological.
 - Chemical oxygen demands.
