

Time: 3 Hours

Subject: Chemistry

Max. Marks: 70

- Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. (a) Calculate the single electrode potential of Zn electrode dipped in 0.01M ZnSO_4 solution at 25°C. Given standard electrode potential of Zn is -0.76v?
(b) What is Breakpoint Chlorination? What is its significance?
(c) A steel nail is inserted in a copper sheet? Which metal undergoes corrosion? And why?
(d) Differentiate between Thermoplastics and thermosetting resins.
(e) Express Dulong's formula for calculation of calorific value.
(f) What are Lithium ion batteries? What are its applications?
(g) What is transesterification?
2. (a) What is the principle and procedure for determination of pH of acid solution by using calomel and quinhydrone electrode?
(b) Describe the construction and working of methanol – oxygen fuel cell and mention its applications.
3. (a) What is demineralization? Explain ion exchange method and regeneration of resin.
(b) What is 'Cathodic protection'? Explain sacrificial anode method to control corrosion.
4. (a) Write the preparation, properties and uses of Nylon 6,6 and Buna-S.
(b) What is the mechanism of conduction in polyacetylene? Write the applications of conducting polymers.
5. (a) A 1Kg coal sample has the following composition- C=95%, H=4% and O=1% . Calculate the minimum weight of air for complete combustion of 5Kg coal sample.
(b) What is 'Cracking'? Explain moving bed catalytic cracking.
6. (a) What is green chemistry? What are the principles of green chemistry?
(b) What are composites? Explain the types of composites and write their applications.
7. (a) A 100ml water sample required 20ml of 0.01M EDTA for titration using EBT indicator, before boiling. The same sample required 8ml of 0.01M EDTA after boiling and filtration. Calculate total, temporary and permanent hardness.
(b) Write the preparation, properties and uses of polylactic acid.
