

Code No: G-5003/N/AICTE

**FACULTY OF ENGINEERING**

**B.E.(EEE/EIE/CSE/AI/CME/DS) I - Semester (AICTE) (Backlog) (New) Examination,  
February/ March 2025**

**Subject: Chemistry**

**Time: 3 Hours**

**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) Write Nernst's equation and define the terms involved in it.  
b) Distinguish between primary and secondary batteries.  
c) What are ion exchange resins? Give their application in water softening method.  
d) Explain briefly about copolymerisation with suitable example.  
e) Distinguish between gross and net calorific value of a fuel.  
f) Write a note on Octane number.  
g) Outline the properties of composites.
2. a) Define reference electrode. Explain the construction of Calomel electrode with a neat diagram.  
b) What is a fuel cell? Describe the construction and applications of methanol - oxygen fuel cell.
3. a) Write the principle of determination of hardness of water by EDTA method. Calculate the temporary, permanent and total hardness of 50ml of standard hardwater containing 1mg  $\text{CaCO}_3$ /ml consumed 2.5 ml of EDTA. 50ml of sample water consumed 15ml of EDTA. 50ml of same sample after boiling and filtration consumed 10ml of EDTA.  
b) Explain the sacrificial anode and impressed current techniques for the prevention of corrosion.
4. a) What are biodegradable polymers. Write preparation, properties and applications of Polylactic acid.  
b) Formulate the mechanism of free radical polymerization
5. a) Explain the composition and uses of LPG and CNG.  
b) Describe the method of fractionation of petroleum.
6. a) Write short notes on: (i) Fiber -reinforced composites (ii) Atom economy  
b) Explain the concept of trans esterification and carbon neutrality.
7. a) Describe the construction of lead acid battery with charging and discharging reactions.  
b) Explain the mechanism of electrochemical corrosion.