

FACULTY OF ENGINEERING**B.E II-Semester Examinations****Subject: CHEMISTRY****Model Paper-1**

Time: 3 Hours

Max. Marks: 70

Note: Answer **ALL** questions from **Part-A** and **FIVE** questions from **Part-B****PART - A (10 × 2 = 20 Marks)**

1. Define standard electrode potential. (Unit-1, Q7)
2. Write the advantages of fuel cells? (Unit-1, Q18)
3. List the names of the salts responsible for hardness of water. (Unit-2, Q2)
4. What is waterline corrosion? Explain. (Unit-2, Q14)
5. Explain the functionality of monomer. (Unit-3, Q2)
6. What are conducting polymers? Give examples. (Unit-3, Q14)
7. What are primary and secondary fuels? Give examples. (Unit-4, Q2)
8. Explain octane rating. (Unit-4, Q13)
9. Explain the term 'Green Chemistry'. (Unit-5, Q1)
10. What are composites? Give their advantages. (Unit-5, Q7)

PART - B (50 Marks)

11. (a) What is calomel electrode? Give its reduction half-cell reaction. (Unit-1, Q25)
(b) Describe the working of a methanol oxygen fuel cell. (Unit-1, Q42)
12. (a) Explain the procedure for the determination of alkalinity of water. (Unit-2, Q28)
(b) A sample of hard water contains the following dissolved salts per liter. $\text{CO}_2 = 44 \text{ mg}$, $\text{Ca}(\text{HCO}_3)_2 = 16.4 \text{ mg}$, $\text{Mg}(\text{HCO}_3)_2 = 14.6 \text{ mg}$, $\text{CaCl}_2 = 111 \text{ mg}$, $\text{MgSO}_4 = 12 \text{ mg}$ and $\text{CaSO}_4 = 13.6 \text{ mg}$. Calculate the temporary and permanent hardness of water in $^\circ\text{Fr}$ and $^\circ\text{Clarke}$. (Unit-2, Q35)
13. (a) Differentiate between high and low calorific value of a fuel. (Unit-4, Q26)
(b) A sample of coal was found to have the following percentage composition: C = 75% ; H = 5.2% ; O = 12.1% ; N = 3.2% and ash = 4.5%. Calculate the minimum amount of air necessary for complete combustion of 1 Kg of coal. (Unit-4, Q50)
14. (a) What is polymerization? Explain the different types of polymerization with examples. (Unit-3, Q19)
(b) What are conducting polymers? Discuss the applications of conducting polymers. (Unit-3, Q36)
15. (a) Explain the principles of green chemistry. (Unit-5, Q12)
(b) What are fibre reinforced composites? What are the advantages of such materials. (Unit-5, Q22)
16. (a) Discuss the advantages and applications of composites. (Unit-5, Q24)
(b) Differentiate between thermoplastic and thermosetting polymers. (Unit-3, Q18)
17. (a) What are lithium ion batteries? Explain their advantages and applications. (Unit-1, Q40)
(b) What are the different types of hardness of water? Explain their determination by using EDTA method. (Unit-2, Q27)

FACULTY OF ENGINEERING**B.E II-Semester Examinations****Subject: CHEMISTRY****Model Paper-2**

Time: 3 Hours

Max. Marks: 70

Note: Answer **ALL** questions from **Part-A** and **FIVE** questions from **Part-B****PART - A (10 × 2 = 20 Marks)**

1. Differentiate between a galvanic cell and an electrolytic cell. Give one example for each kind. (Unit-1, Q5)
2. What is quinhydrone electrode? Write the reduction electrode reaction of it. (Unit-1, Q10)
3. Define the term "Reverse Osmosis" and what is its uses. (Unit-2, Q5)
4. Explain the mechanism of electrochemical corrosion. (Unit-2, Q12)
5. What is co-polymerization? (Unit-3, Q7)
6. Write the structure of bakelite. (Unit-3, Q9)
7. Define fuel. How are fuels classified? (Unit-4, Q1)
8. Write the uses of compressed natural gas (CNG). (Unit-4, Q18)
9. Write the principles of Green chemistry. (Unit-5, Q3)
10. What is trans-esterification? Explain. (Unit-5, Q6)

PART - B (50 Marks)

11. (a) Describe the typical galvanic cell and show how the chemical energy is converted into electrical energy. (Unit-1, Q22)
(b) For the cell reaction $\text{Zn(s)} + \text{Fe}^{2+} = \text{Zn}^{2+} + \text{Fe(s)}$. Calculate the reactive concentration of Zn^{2+} and Fe^{2+} at which the overall cell E.M.F. becomes zero.
 $E^\circ_{\text{Fe}^{2+}/\text{Fe}} = -0.440 \text{ V}$ and $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = 0.760 \text{ V}$ (Unit-1, Q34)
12. (a) Explain different types of corrosion and write their mechanism. (Unit-2, Q43)
(b) Write in detail about galvanizing and tinning. (Unit-2, Q54)
13. (a) Differentiate between high and low calorific value of a fuel. (Unit-4, Q26)
(b) How gasoline is obtained from moving bed catalytic cracking? (Unit-4, Q39)
14. (a) Describe the preparation, properties and uses of PVC. (Unit-3, Q24)
(b) Explain the mechanism of conduction in polyacetylene. (Unit-3, Q39)
15. (a) Explain the concept of trans-esterification and carbon neutrality. (Unit-5, Q16)
(b) Define composite materials and explain its characteristics. (Unit-5, Q18)
16. (a) Explain different types of composites. Write the applications of composites. (Unit-5, Q25)
(b) Write a note on silicone rubber. (Unit-3, Q34)
17. (a) Write the charging and discharging reactions in lead-acid battery. (Unit-1, Q39)
(b) Discuss the factors that affecting the rate of corrosion. (Unit-2, Q50)