

Reg. No.:



Name:

University of Kerala

U8791

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

POLYMER CHEMISTRY

UK2DSCPOC101 - FUNDAMENTALS OF CHEMISTRY-II

Academic Level: 100-199

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions

Qn No.	Question	CL	CO
1	Which type of electrons are responsible for the electrical conductivity of metals according to the free electron theory?	RE	2
2	What substances do metal hydrides typically react with?	RE	4
3	Why can't a π bond exist independently without a σ bond?	UN	2
4	. Which is more toxic: a chemical with a low LD50 or a high LD50?	UN	4
5	Identify the hybridization of xenon in the molecule XeF_4 ?	UN	1
6	How does gas chromatography separate volatile compounds?	UN	3

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Why is regular training on emergency procedures vital for laboratory personnel?	UN	4
8	How would increasing the polarity of the mobile phase affect retention time in partition chromatography?	UN	3
9	Compare the bond strength of N_2 and F_2 based on MO theory.	AP	1
10	Explain how the Molecular Orbital theory accounts for the formation of sigma and pi bonds in molecules .	AP	2

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) If a corrosive chemical is spilled in a laboratory, what actions would you take to manage the situation safely, using your knowledge of labeling, hazard symbols, and material safety data sheets (MSDS)? OR B)	AP	4, 4

Qn No.	Question	CL	CO
	A laboratory procedure requires the use of a gas that is both toxic and flammable. How would you apply appropriate hazard control measures to safely conduct this procedure?		
12	A) Explain the Born-Haber cycle and explain its significance in the study of ionic compounds. List the steps involved in the cycle and explain the energy changes that occur at each step . OR B) Analyze how cation charge, size and anion size influence the covalent character of ionic bonds according to Fajans' rules.	AN	2, 2
13	A) Predict the shape and hybridization of IF ₅ using VSEPR theory OR B) Evaluate the relationship between bond order, bond length, and bond energy based on molecular orbital theory using examples of O ₂ and O ₂ ⁻ ? Also explain their magnetic behaviour.	EV	1, 1
14	A) Design a sampling protocol for analyzing pollutants in river water. Highlight steps to ensure representativeness and minimize errors. OR B) Explain the sources of error and the role of mean, standard deviation and confidence intervals in the interpretation of analytical data.	CR	3, 3