



Reg. No.: .....

Name: .....

## University of Kerala

First Semester FYUGP Degree Examination, December 2025

Discipline Specific Core Course

### CHEMISTRY

#### UK1DSCCHE103 - FOUNDATIONS OF INORGANIC & POLYMER CHEMISTRY

Academic Level: 100-199

2025-Admission onwards

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	Identify the hydrogen spectral lines observed in the visible region.	RE	1
2	Indicate the chemical equation for the preparation of nylon 66.	RE	3
3	The closeness of measured values to each other is called _____,	UN	4
4	The indicator used in complexometric titration is .....	UN	4
5	PAN, a component of photochemical smog, is .....	UN	2
6	Give the electronic configuration of chromium (Z = 24)	UN	1

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	Compare addition and condensation polymers with examples.	UN	3
8	Describe the main postulates of Bohr's model of the hydrogen atom, focusing on quantized orbits and energy transitions.	UN	1
9	A chemical industry releases wastewater containing heavy metals and organic pollutants. Suggest two suitable methods for treating this wastewater and briefly explain how each method helps in purification.	AP	2
10	If 85 mL of 0.45 N NaOH solution neutralizes a 235 mL HCl solution. Calculate the normality of HCl solution.	AP	4

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	<p>A)</p> <p>Predict which has more electron gain enthalpy - chlorine or fluorine. Explain. Also arrange the following in order of decreasing electron gain enthalpy: nitrogen, oxygen, fluorine. Justify your answer.</p> <p>OR</p> <p>B)</p> <p>Write the electronic configurations of Fe (26), <math>\text{Fe}^{2+}</math>, and <math>\text{Fe}^{3+}</math> using the Aufbau principle. Explain why 4s electrons are removed before 3d electrons during ion formation.</p>	AP	1, 1
12	<p>A)</p> <p>Analyze the differences in properties and applications between thermoplastics and thermosetting plastics, with suitable example. Explain why one type is suitable for molding and the other for electrical insulation.</p> <p>OR</p> <p>B)</p> <p>Compare natural rubber and synthetic rubbers (SBR, nitrile rubber, neoprene) by analyzing their structure, properties, and industrial applications. Explain how vulcanization improves the properties of natural rubber.</p>	AN	3, 3
13	<p>A)</p> <p>A metropolitan city experiences dense smog during winter. Using the concepts of classical and photochemical smog, analyze the possible causes.</p> <p>OR</p> <p>B)</p> <p>Evaluate whether ozone layer depletion contributes to global warming. Compare its effect with that of greenhouse gases.</p>	EV	2, 2
14	<p>A)</p> <p>Design a calculation scheme to express the concentration of a solution of NaOH in weight percentage, molality, normality, mole fraction, ppm, and millimoles. Present your method clearly.</p> <p>OR</p> <p>B)</p> <p>Propose a standardized laboratory protocol for preparing and standardizing 0.1 M HCl solution, including the choice of primary standard, glassware requirements, and endpoint recognition strategy.</p>	CR	4, 4