

Reg. No.:



Name:

University of Kerala

U9129

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

POLYMER CHEMISTRY

UK2DSCPOC105 - SYNTHETIC POLYMERS

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	Name two common examples of thermosetting polymers.	RE	1
2	Name the thermal analysis technique used to study melting and crystallization behavior of polymers.	RE	3
3	Tensile strength is defined as the maximum stress a material can withstand before _____.	UN	3
4	Poly(lactic acid (PLA) is a ----- thermoplastic commonly used in 3D printing products and food packaging.	UN	1
5	What makes thermosetting polymers good electrical insulators?	UN	1
6	Give two benefits of using reinforced polymer composites.	UN	2

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	How does the molecular structure of a polymer influence its tensile strength?	UN	3
8	Why are thermosetting polymers chemically resistant? Name one chemical they resist well.	UN	1
9	If an impact test shows high energy absorption, what does this indicate about the polymer's structure?	AP	3
10	Explain the causes for enhancing the electrical conductivity on adding carbon-based reinforcements to polymers.	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) Explain the role of Testing Standards in Quality Control used in polymer testing OR B)	AP	3, 3

Qn No.	Question	CL	CO
	A company is developing a new polymer-based packaging material. Explain how following ASTM or ISO testing standards during product development ensures performance, safety, and market acceptance.		
12	A) Thermoplastics like PVC and PTFE show vastly different electrical insulation properties. Analyze the molecular structure and bonding of these materials to explain the observed differences. OR B) Analyze the role of thermoplastics in the automotive industry. Why are materials like Polypropylene (PP) and Acrylonitrile Butadiene Styrene (ABS) preferred for interior components?	AN	1, 1
13	A) Describe the advantages and disadvantages of reinforced polymer composites compared to traditional materials such as metals, and evaluate their suitability for structural applications. OR B) Explain the role of reinforcements in modifying the behaviour of polymers under mechanical stress and thermal loading.	EV	2, 2
14	A) Create a classification scheme for reinforcement materials based on their size, structure and impact on polymer properties taking fibres, fillers and nano particle as examples. OR B) Explain the potential of carbon nanotubes (CNTs) in polymer reinforcement for electronic applications	CR	2, 2