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| **University of Kerala** | | |
| Discipline: Polymer Chemistry |  | Time: 1 Hour 30 Minutes (90 Mins.) |
| Course Code: UK1DSCPOC104 |  | Total Marks: 42 |
| Course Title: Basics of Polymer Chemistry |  |  |
| Type of Course: DSC |  |  |
| Semester: 1 |  |  |
| Academic Level: 100-199 |  |  |
| Total Credit: 4, Theory: 3 Credit  (Applicable for 4 Credit Course with 1 Credit Practical Also) |  |  |

Part A. 6 Marks. Time: 6 Minutes

Objective Type. 1 Mark Each. Answer All Questions

(Cognitive Level: Remember/Understand)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 1. | What type of polymer is commonly used in plastic bags? | Remember | CO-1 |
| 2. | ----- test is used to detect the presence of nitrogen in an organic compound . | Remember | CO-4 |
| 3. | Which are the different steps in polymerization techniques? | Understand | CO-5 |
| 4. | PET bottles are widely used commercially. Explain. | Understand | CO-2 |
| 5. | Distinguish nylon 6 with nylon 6,6. | Understand | CO-2 |
| 6. | Write an example for a branched polymer | Understand | CO-1 |

Part B. 8 Marks. Time: 24 Minutes

Short Answer. 2 Marks Each. Answer All Questions

(Cognitive Level: Understand/Apply)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 7. | What is the significance of tensile testing in evaluating polymer mechanical properties? | Understand | CO-2 |
| 8. | Define tacticity in polymers and explain its importance | Understand | CO-1 |
| 9. | What is formaldehyde resin? How can it be prepared? | Apply | CO-2 |
| 10. | Describe the differences in densities and crystallinity between LDPE & HDPE . | Apply | CO-1 |

Part C. 28 Marks. Time: 60 Minutes

Long Answer. 7 marks each. Answer all 4 Questions, choosing among options within each question.

(Cognitive Level: Apply/Analyse)

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| 11. | (a) Outline the steps involved in the synthesis of polyethylene through the Ziegler – Natta process  OR  (b) Explain Anionic & Cationic Polymerization and their applications to synthesize various polymers | Apply | CO-5 |
| 12. | (a)Describe the various techniques used for characterizing polymers by molecular weight such as GPC,light scattering and viscosity method.  OR  (b) Describe the various environmental testing methods for characterization in polymers | Apply | CO-2 |
| 13. | (a) What are Fibres? Explain the properties and commercial application of the following fibres  1.Nylon-6  2.Nylon 6,6  3.Poly ester  OR  (b) Write the monomers and explain the commercial application of the following polymers  1.Bakelite  2.PVC  3.PET | Apply | CO-2 |
| 14 | (a) Analyze the classification, properties and structure of various types of polymers.  OR  (b) Discuss the structure and properties of linear, branched and cross-linked polymers. | Analyze | CO-1 |

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| **Cognitive Level** | **Marks** | **Percentage** |  | **Course Outcomes** | **Marks** | **Percentage** |
| Remember | 2 | 4.8 |  | CO-1 | 13 | 31 |
| Understand | 8 | 19.0 |  | CO-2 | 20 | 48 |
| Apply | 25 | 59.5 |  | CO-4 | 1 | 2 |
| Analyse | 7 | 16.7 |  | CO-5 | 8 | 19 |
| **TOTAL** | **42** | **100** |  | **TOTAL** | **42** | **100** |