

(3 Hours)

Total Marks = 80

N.B. (1) Question No 1 is compulsory.

(2) Attempt any three questions out of remaining five questions.

(3) Assumption made, if any should be clearly stated.

(4) Figures to the right indicate full marks.

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| Q.1 | a) | Explain High performance and speciality polymer | 05 |
| | b) | Explain various types of polymer degradation | 05 |
| | c) | Explain block and graft copolymer | 05 |
| | d) | Explain Natural polymer Cellulose with properties and application | 05 |
| Q.2 | a) | What are the various ways of expressing molecular weight of polymers? Derive an expression to find out the average molecular weight of the polymer. | 12 |
| | b) | Explain the term "Glass Transition Temperature" (T _g) Discuss the significance of T _g in polymer processing | 08 |
| Q.3 | a) | What is Co-polymerization ? Derive the rate equation for addition Co-Polymerization | 10 |
| | b) | Explain with flowsheet manufacturing of polystyrene with properties and application. | 10 |
| Q.4 | a) | Explain various methods for determination of Monomer Reactivity Ratios | 10 |
| | b) | Explain in detail Blow molding process for manufacture of hollow bottle with relevant sketch | 10 |
| Q.5 | a) | List different types of polymerization technique with their advantages and disadvantages and briefly explain emulsion polymerization technique | 10 |
| | b) | What is step growth polymerization and explain in detail kinetics of step growth polymerization. | 10 |
| Q.6 | a) | Explain post polymerization unit operation in detail technique for polyester manufacturing. | 10 |
| | b) | Explain ideal and azeotropic copolymerization | 10 |