

[3 Hours]

[Total Marks:80]

- N. B.:** (1) Question No. 1 is **Compulsory**.
 (2) Attempt any **Three** questions out of the remaining **Five** questions.
 (3) Figures to the **right** indicate **full** marks.
 (4) Make **suitable** assumptions wherever **necessary**.

- Q1 Answer the following sub-questions (**Any Four**) **20**
- (a) Write a note on Antioxidants and Stabilizers **5**
- (b) Explain azeotropic copolymerization **5**
- (c) Explain fillers, and plasticizers use in polymer processing. **5**
- (d) Write explanatory note on solubility behavior of polymer **5**
- (e) Define the term apparent Viscosity **5**
- Q2
- (a) Explain in detail kinetics of homogeneous polymerization **10**
- (b) What is step growth polymerization and explain in detail kinetics of step growth polymerization. **10**
- Q3
- (a) List different types of polymerization techniques with their advantages and disadvantages and briefly explain suspension polymerization techniques with industrial examples **10**
- (b) Explain in detail Interfacial Polymerization with its advantages. **10**
- Q4
- (a) Explain in detail Injection moulding process for thermoplastic material with relevant sketch. **10**
- (b) Explain various methods for determination of monomer reactivity ratios in copolymerization system. **10**
- Q5
- (a) Explain in details the phenomenon of polymer degradation with regards to types, causes, effects, and remedies. **10**
- (b) Draw and explain Nylon 6 Manufacturing process in detail. **10**
- Q6
- (a) Define and explain term Polymer rheology and morphology **10**
- (b) Explain in detail the effect of stoichiometric imbalance on molecular weight of polymer. **10**