Instructions:

1. Answer any three:
   (a) Explain polyamides and polyterpenes.
   (b) Explain Kinetics of catalysed and non-catalysed step polymerisation.
   (c) Describe isomerism and tacticity of polymers.
   (d) Explain phase techniques in chain polymerisation.

2. Answer any three:
   (a) Explain vinyl and acrylic polymers in detail.
   (b) Discuss the following reactions in polymer:
       (i) Hydrolysis (ii) Hydrogenation (iii) Addition
   (c) Explain the synthesis and applications of the polycarbonates and silicones.
   (d) Discuss thermal, oxidative and photo-degradation of polymers.

3. Answer any three:
   (a) Define $T_g$. Discuss factors affecting glass transition temperature.
   (b) Explain the light scattering method to determine molecular weight of polymer.
   (c) Explain the following (i) Chain folding during crystal formation
       (ii) Spherulites and Crystallites
   (d) Explain IR and NMR for identification and characterization of polymers.
Answer any four:
(a) Write a note on polymer vs small molecular weight substances
(b) Discuss Cyclization reaction for polymers.
(c) Write a note on industrial useful natural polymer.
(d) Give the synthesis and applications of one commercially important copolymer.
(e) Explain dilatometer method to determine $T_g$