



PART B — (5 × 16 = 80 marks)

11. (a) (i) Distinguish between thermoplastics and thermosetting plastics. (8)  
(ii) Write the synthesis of nylon-6,6 and Epoxy resins. (8)

Or

- (b) (i) Compare addition polymerization and condensation polymerization. (8)  
(ii) Write notes on bulk, emulsion, solution and suspension polymerization techniques. (8)
12. (a) (i) Derive Gibbs - Helmholtz equation. (12)  
(ii) Derive Van't-Hoff isotherm equation. (4)

Or

- (b) Derive all the four Maxwell relations. (16)
13. (a) (i) Distinguish the differences in fluorescence and Phosphorescence. (8)  
(ii) Discuss the applications of UV-Visible spectroscopy. (8)

Or

- (b) (i) Explain the mechanism of energy transfer in photosensitization and quenching process. (12)  
(ii) Discuss the mechanism of chemiluminescence. (4)
14. (a) (i) Draw a neat one component water system and explain in detail. (12)  
(ii) Explain the following heat treatment processes : (1) Annealing (2) Hardening. (2+2)

Or

- (b) (i) What are the types Heat treatable alloy steel. (10)  
(ii) Write the composition, properties and uses of various types of Bronze. (6)
15. (a) (i) Discuss the size dependent properties of nanomaterials. (8)  
(ii) Write a note on carbon nanotubes and their properties. (8)

Or

- (b) (i) Write a note on top-down and bottom-up approach for nanomaterial preparation with examples. (8)  
(ii) What are nanoclusters and nanowires? Explain their properties and applications. (8)