

NTK/KW/15/7909

Faculty of Engineering and Technology

**Fifth Semester B.Tech. (Chemical Tech.)
(C.B.S.) Examination**

PLASTICS AND POLYMER TECHNOLOGY—III

(Special Tech.—III)

Paper—V

Time : Three Hours]

[Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
 - (2) Answer any **FIVE** questions.
 - (3) Due credit will be given to neatness and adequate dimensions.
 - (4) Diagrams and Chemical equations should be given wherever necessary.
 - (5) Illustrate your answers wherever necessary with the help of neat sketches.
 - (6) Discuss the reaction, mechanism wherever necessary.
1. (a) Discuss the chemical composition of the polymer molecule by considering :
 - (i) Nitrogen element
 - (ii) Halogen element

- (iii) Sulfur element
- (iv) Silicon element. 8
- (b) Explain the effect of monomer ingredient present in the final polymer composition. 8
- 2. Explain the relationship between molecular weight and processing of polymers by considering the following parameters :
 - (i) Thermoplastic processing at constant molecular weight
 - (ii) Processing repairing high molecular weight
 - (iii) Crystalline polymers
 - (iv) Conversion to high molecular weight during processing. 16
- 3. What is the glass transition temperature ? Explain the transition and associated properties in detail. 16
- 4. (a) How the orientation occurs in polymer ? Explain the importance of mobility during orientation. 8
- (b) Explain the orientation of polymers during various processing techniques. 8
- 5. (a) What do you mean by crystallinity of polymers ? What are the factors which affect the crystallinity of polymers ? 8

- (b) Write short notes on :
 - (i) Lubricants
 - (ii) Flow promoters. 8
- 6. (a) Discuss the plasticizers in detail and differentiate between external and internal plasticizers. 8
- (b) Explain two roll mill in detail. 8
- 7. (a) What is the role of fillers in polymer compounding ? Explain the characteristics that determine the effect of filler on polymer compounding. 12
- (b) What is the difference between co-rotating and counter rotating twin screw extruder ? 4
- 8. What are the criteria of materials to be act on additives ? Explain the additives used in rubber compounding in detail. 16