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B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2012

MATERIAL SCIENCE BRANCH

FOURTH SEMESTER

ML 9256 POLYMER PROCESS ENGINEERING

(REGULATIONS 2008)

TIME: 3 hr

MAX MARKS: 100

Answer ALL Questions

Part A (10 x 2 = 20 marks)

1. What is T_g? What is its use?
2. Why PE is stiff and hard at room temperature?
3. Define solubility parameter.
4. What is theta temperature?
5. What are vented extruders?
6. What is the principle of co-extrusion?
7. Mention the common problems that arise in moulding processes.
8. What is sprueless moulding?
9. Define tenacity.
10. What are the various types of calendaring roll arrangements?

Part B (5 x 16 = 80 marks)

11. (a) (i) How are polymers classified? Illustrate with suitable examples. 10
- (ii) What is a MWD curve? What is its use? Define polydispersity. 6

12. (a) (i) Define configuration and conformation. Distinguish them with suitable examples. 6

(ii) What are the various thermodynamic relations and indicate their effects on the polymer. 10

OR

(b) (i) What are the two stages of the process of dissolving a polymer? What are the variables that affect the polymer solubility? 6

(ii) Explain the interrelation between polymer processing, structure and properties with appropriate examples. 10

13. (a) What are the features of a single screw extruder? Derive the relation for the total flow in a single screw extruder. 16

OR

(b) Describe the blown film extrusion process in detail and mention the effect of processing variables on the quality of the film produced. 16

14. (a) Distinguish between compression and transfer moulding. Describe the advantages and limitations of the processes with neat sketches. 16

OR

(b) Explain the injection moulding process in detail. Compare the two plate and three plate moulds with neat diagrams. 16

15. Explain any two of the following: 16

- i. RIM and RRIM
- ii. FRP methods
- iii. Structural Foam moulding
- iv. Sandwich moulding