

8/11/13

B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2013

MATERIAL SCIENCE BRANCH

FOURTH SEMESTER

ML 9256 POLYMER PROCESS ENGINEERING

(REGULATIONS 2008)

TIME: 3 hr

MAX MARKS: 100

Answer ALL Questions

28

Part A (10 x 2 = 20 marks)

1. How are T_g and T_m related?
2. Define polydispersity index.
3. What is theta temperature?
4. What is MFI?
5. What is a smear head screw?
6. What is the principle of cross head extrusion?
7. What is a moulding cycle?
8. What is sprueless moulding?
9. Define tenacity. Give an example.
10. What is a calendar roll? What are its major types?

Part B (5 x 16 = 80 marks)

11. How are polymers classified based on
 - (1) source
 - (2) structure
 - (3) thermal properties and
 - (4) applicationsGive suitable examples. 16

12. (a) (i) Explain the dissolution of polymers. What is solubility and what are its significances? 6

(ii) Define and relate the various thermodynamic relations and indicate their effects on the polymer. 10

OR

(b) (i) What are the various parameters that have an influence on the solubility of polymers? Discuss them briefly. 6

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

13. (a) What are the features of a single screw extruder? Explain the flow mechanisms in detail and derive the relation for the total flow in a single screw extruder. 16

OR

(b) With a neat sketch, 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 relative advantages and disadvantages of the moulding processes with neat sketches. 16

OR

(b) Explain the injection moulding process in detail. Compare the design aspects of two plate and three plate moulds. What are the common problems, their cause and effects? 16

15. (a) What is calendaring? What is its principle? Explain the process with neat diagrams. 16

OR

(b) Briefly write a note on the following processing methods: 16

i. Fiber spinning process

ii. RIM and RRIM