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**B.E / B.Tech ( Full Time ) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014**

**MATERIAL SCIENCE AND ENGINEERING**

**Semester 4**

**ML 9256 Polymer Process Engineering**

**(Regulation 2008)**

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. What are the important transition temperatures in polymers?
2. What are the different types of molecular weights in a polymer sample?
3. What is theta temperature? What is its use?
4. What is the difference between configuration and conformation?
5. What is the principle of co-extrusion?
6. What is the role of vent in an extruder?
7. Suggest a suitable processing method for the water tanks. Justify your choice.
8. What is spruless moulding?
9. What is embossing?
10. What is the principle of RRIM?

**Part – B ( 5 x 16 = 80 marks)**

11. (i) How are polymers classified based on the effect of temperature? Give examples. 6
- (ii) Explain the principle of GPC. How do you determine the molecular weight of a sample using GPC? 10
12. a) (i) Explain the dissolution of polymers. What is solubility parameter and what are its significances? Explain the various thermodynamic relations and

indicate their effect on polymers.

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OR

- b) (i) Explain the various parameters that have an influence on the solubility of polymers? Mention and explain the interrelation between polymer processing, structure and properties with appropriate examples. 16

13. a) What is an extruder? What are the general characteristics of a single screw extruder? Explain the flow mechanism with a neat diagram. 16

OR

- b) (b) Describe the blown film extrusion process with a neat diagram. What are its types? Explain the advantages and disadvantages of each type. 16

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

OR

- b) (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) Distinguish between the major methods of spinning fibers? Explain the processes with neat diagrams. 16

OR

- (b) Briefly explain the RIM and RRIM processes with suitable examples.

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