

18.5.19

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B.E /B.Tech (Full Time) END SEMESTER EXAMINATIONS, April / May 2019  
Material Science  
Third Semester  
CY8302 – Polymer Science and Engineering  
(Regulation 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Give examples for bifunctional and trifunctional monomers.
2. What is gel point of a polymer?
3. What is Polydispersity index of a polymer?
4. What is degree of polymerization?
5. State any two thermal transitions of a polymer.
6. What is lamellae?
7. What are the two stages of solubilisation of polymer?
8. What is the relation between size and solubility of the polymer?
9. What kinds of products are preferred for rotational moulding?
10. List any two precautions to be taken for screw extruder.



Part – B ( 5 x 16 = 80 marks)  
(Question No.11 is Compulsory)

11. Describe the mechanisms of cationic and anionic polymerisations with an example each. (16)
12. a) Describe any two methods of molecular weight determination with neat diagram.(16)  

(OR)

b) Find (i) number-average molecular weight (ii) weight-average molecular weight (iii) degree of polymerization for the given pure polypropylene material with the following accurate data. (16)

<i>Molecular Weight Range (g/mol)</i>	$x_j$	$w_j$
8,000–16,000	0.05	0.02
16,000–24,000	0.16	0.10
24,000–32,000	0.24	0.20
32,000–40,000	0.28	0.30
40,000–48,000	0.20	0.27
48,000–56,000	0.07	0.11

13. a) Define Tg. Explain any two experimental methods to determine Tg. (16)

(OR)

- b) (i) Define crystallinity of polymers, what are the factors affecting crystallinity of polymers? (10)  
(ii) What are the effects of crystallinity on the properties of polymers. (6)

14. a) (i) Derive the relationship between Viscosity and molecular weight of polymers. (10)  
(ii) Write a note on nature of polymer molecules in solution. (6)

(OR)

- b) (i) Explain Newtonian and Non-Newtonian flow behavior of polymers. (10)  
(ii) Write a note on rheology of polymer melts. (6)

15. a) Explain the principle and working of compression moulding and blow moulding with neat diagrams. (16)

(OR)

b) Explain the principle and working of Thermo forming and vacuum forming with neat diagrams. (16)

