

[This question paper contains 2 printed pages.]

Your Roll No.

5168

B

B.Sc. Prog./III

EL 310 (ii)—Polymer Science
(Admissions of 2005 and onwards)

Time : 2 Hours

Maximum Marks : 38

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *Four* questions in all.

Question No. 1 is compulsory and carries 8 marks.

All other questions carry 10 marks each.

1. Write the structure and applications of the following : 8
 - (i) Novalac
 - (ii) Polystyrene
 - (iii) Nylon-6,6
 - (iv) Polyisoprene.
2.
 - (i) Give the mechanism for cationic polymerization of styrene.
 - (ii) What are isotactic, syndiotactic and atactic polymers? 5+5
3. (i) What are Ziegler-Natta catalysts ? What are their advantages ?

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- (ii) What is meant by conducting polymers ?
- (iii) Elaborate the term 'degree of crystallinity'. 4+3+3
4. (i) Describe the preparation and uses of polythiophene.
- (ii) Explain lower and upper critical solution temperatures.
- (iii) What thermal transitions occur on heating a polymer ? 5+2+3
5. (i) Write a short note on vulcanization.
- (ii) What is teflon ? How is it synthesized ? Is it an addition or a condensation polymer ?
- (iii) What are copolymers ? Give the chemical equation for the preparation of terylene. 3+4+3
6. In a polymer sample, 25% molecules have molecular mass 25,000, 40% molecules have 30,000 and rest 35% have 40,000. Calculate the number average, mass average and polydispersity index. Also tell whether the polymer is monodispersive and polydispersive. 10