

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 2907

L

Unique Paper Code : 2172554801

Name of the Paper : DSC: POLYMERS AND PLASTICS

Name of the Course : **B.Sc. (Prog.) Industrial Chemistry**

Semester : VIII

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **Four** questions in all. Each question carries equal marks.

1. (a) What are conducting polymers, and how do they differ from traditional insulating polymers? Explain n-doping and p-doping.
(b) Explain why thermosetting polymers cannot be remoulded after heating. Also, differentiate between thermoplastics and thermosetting polymers.
(c) Write the preparation, properties, and uses of polybutadiene. (5,5,5)
2. (a) Differentiate between biodegradable and non-biodegradable polymers with examples.
(b) What are blowing agents used in polymers? Explain their working principle.
(c) Write the structure of polymer obtained from the reaction of following monomers and name the product and its applications. Write the preferred mechanism for the reaction, $n\text{ClOC}-(\text{CH}_2)_5-\text{COCl} + n\text{NH}_2-(\text{CH}_2)_6-\text{NH}_2$ (5,5,5)
3. (a) Describe kinetics of chain polymerization by free radical. Obtain expression for rate of polymerization and degree of polymerization.
(b) What are the different forms of polystyrene, and how do they differ in terms of properties and applications?
(c) How are polymers classified based on their origin? Explain natural and synthetic polymers with examples. (5,5,5)
4. (a) How do additives affect the texture and tactile properties of polymers?
(b) Differentiate between mechanical recycling, chemical recycling and biological recycling.
(c) Explain about structure-property relationship of polymers. What are the factors affecting the polymer property? (5,5,5)

P.T.O.

5. (a) Differentiate between addition and condensation polymerization with examples.
(b) What do the numbers in Nylon-6,10 represent? Describe its method of preparation.
(c) Explain the injection moulding technique. Discuss its advantages and disadvantages. (5,5,5)
6. Write short notes on the following: (**Any Three**)
(a) Ring opening polymerization
(b) Polycarbonates
(c) Number average molecular weight in polymers
(d) Stabilisers. (5,5,5)