2023

Time - 3 hours

Full Marks - 60

*Answer **all groups** as per instructions.*
Figures in the right hand margin indicate marks.

GROUP – A

1. Answer all questions and fill in the blanks as required. [1 × 8

(a) The monomer used to prepare Nylon-6 is _____.

(b) The functionality of C_2H_2 is _____.

(c) The composition of a Zeigler-Natta catalyst is _____.

(d) What is PDI formula ?

(e) Between $\bar{M}_w$ and $\bar{M}_n$, whose value is less ?

(f) What is the relationship between T_m and T_g for symmetrical polymers ?

(g) What is structural name of Teflon ?

(h) Give an example of conducting polymer.

GROUP – B

2. Answer any eight of the following questions within two to three sentences each. [1½ × 8

(a) What are copolymers ? Give examples.

(b) Mention the functionality of phenol, glycerol, ethylene glycol.

(c) How is Nylon-6,6 prepared ?

(d) Explain degree of crystallinity of a polymer.

(e) What is vulcanisation of rubber ?

(f) What are living polymers ?

(g) Classify polymers on the basis of tacticity.

(h) Name three experimental methods for the determination of molecular mass of polymers.

(i) How is polypropylene prepared ? Mention its important uses.

(j) What are polyurethanes ?

GROUP – C

3. Answer any eight of the following questions within 75 words each. [2 × 8

(a) Establish the relation between extent of reaction and degree of polymerisation.

(b) Name the following polymers by IUPAC system :

$-CH_2-CH_2-CH_2-CH_2-$ and $(-CH_2-\underset{\underset{OH}{|}}{CH}-)_n$

(c) Differentiate between thermosetting and thermoplastic polymers.

(d) Differentiate between elastomers and fibres.

(e) Name four types of polymerisation techniques.

(f) Name the factors which affect crystalline melting point of polymers.

(g) Give examples of addition and condensation polymerisations.

(h) What is the difference between bakelite and novolac ?

(i) What are biodegradable polymers ? Give examples.

(j) How LDPE differs from HDPE by physical properties ?

GROUP – D

*Answer **all** questions.*

4. Write notes on : [3 × 2

(i) Texture of polymers

(ii) Molecular forces and bonding in polymers

OR

Give the classification of polymers on the basis of different schemes of classification. [6

5. Discuss the mechanism and kinetics of step growth polymerisation. [6

OR

Discuss mechanism and kinetics of copolymerisation. [6

6. Explain the determination of molecular mass of polymers by viscometry method. [6

OR

What is WLF equation ? Highlight the factors affecting glass transition temperature. [2 + 4

7. Discuss the preparation and uses of the following : [3 × 2

(i) Poly vinyl acetate

(ii) Poly acryl amide

OR

Discuss the methods of preparation and uses of the following :

(i) Teflon [3 × 2

(ii) Polyethylene