

17446

16117

3 Hours / 100 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-Programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (8) Use of Steam tables, logarithmic, Mollier's chart is permitted.
 - (9) Abbreviations used convey usual meaning.

Marks

1. Attempt any TEN of the following:

20

- a) Define polymer. Name any two commercially important polymers.
- b) State two characteristics of addition polymerisation.
- c) Define functionality and state the functionality of -
 - (a) adipic acid
 - (b) glycerol

P.T.O.

- d) State meaning of free radical polymerisation.
- e) What is the meaning of critical micelle concentration ?
- f) What is the number average molecular weight ? Write its formula.
- g) Define commodity plastics. Give two examples of it.
- h) Explain the importance of glass transition temperature.
- i) Define amorphous polymer. Give two examples.
- j) Define surfactants. State their role in emulsion polymerisation.
- k) What is $\overline{M}_w$? Which value is higher. $\overline{M}_n$ or $\overline{M}_w$?
- l) Define polymer degradation.
- m) Define ionic copolymerisation technique. Name two types of ionic polymerisation.

2. Attempt any FOUR of the following:

16

- a) Explain the classification of polymers on the basis of their origin.
- b) Explain with examples, anionic polymerisation.
- c) Explain bulk polymerisation technique.
- d) Describe effect of plasticisation on glass transition temperature.
- e) Describe cryoscopy.
- f) Differentiate between thermoplastic and thermosetting polymers, give an example of each.

- 3. Attempt any FOUR of the following:** **16**
- a) What is an oxidative degradation ? Explain with examples.
 - b) (i) Explain the solution polymerisation technique.
(ii) Write its any two merits.
 - c) What is a copolymer ? Define alternate copolymer with an example.
 - d) Write any two merits and demerits of emulsion polymerisation technique.
 - e) Explain the effect of molecular weight on glass transition temperature of a polymer ?
 - f) Describe ebulliometry method.
- 4. Attempt any FOUR of the following:** **16**
- a) Explain the chain transfer reactions giving examples.
 - b) What is cationic polymerisation ? Explain with an example.
 - c) Describe the method for the determination of average molecular weight by viscometry.
 - d) How will you prevent polymer degradation ?
 - e) Explain the relation between glass transition temperature and softening point of a polymer.
 - f) Explain suspension polymerisation technique.
- 5. Attempt any FOUR of the following:** **16**
- a) Describe role of functionality in polymerisation reaction.
 - b) What is an engineering plastic ? Give any four examples of it.
 - c) Describe the ultracentrifugation method.
 - d) Explain the concept of 'K' value.
 - e) Describe thermal degradation. Give two examples.
 - f) Explain the polycondensation method, with an example.

6. Attempt any FOUR of the following:**16**

- a) Explain the coordination polymerisation method with an example.
 - b) Write characteristics of condensation polymerisation. Name two condensation polymer.
 - c) Compare bulk and suspension polymerisation techniques on the basis of their merits and demerits.
 - d) Explain how would you calculate average molecular weight of a polymer, using sedimentation technique.
 - e) Define block and graft copolymers with suitable examples.
 - f) (i) Define with an example :
 - (1) Polymer
 - (2) Monomer
 - (ii) Write glass transition temperatures of polyethylene and polypropylene.
-