

17446

15162

3 Hours / 100 Marks

Seat No.

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- 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.

Marks

1. **Attempt any TEN of the following:** **20**
- a) Define elastomers and fibre.
 - b) What is use of initiator ? Name two initiators for emulsion polymerisation.
 - c) Why are copolymerisation, popular ? Name of commercial copolymer.
 - d) Write two demerits of bulk polymerisation technique.
 - e) Define functionality. State functionality of ethylene.
 - f) What is number average molecular weight ? Write its formula.
 - g) Define homopolymer and a co-polymer.
 - h) Write two merits of solution polymerisation technique.

P.T.O.

- i) Define the term 'viscosity', write its unit.
- j) Define an 'antioxidant'. Give two antioxidants.
- k) Define glass transition temperature.
- l) Name two photostabilizers. Name a polymer, where they are used.
- m) Enlist the factors which affects the glass transition temperature.
- n) Write down the glass transition temperature of -
 - (i) Polystyrene
 - (ii) PVC

2. Attempt any FOUR of the following: 16

- a) Explain the terms alternate copolymer and random copolymer with schematic representation.
- b) Explain termination mechanism in ionic polymerisation.
- c) Compare solution and suspension polymerisations technique.
- d) Define -
 - (i) MWD, represent graphically
 - (ii) Poly dispersibility factor should it be low or high.
- e) Explain the effect of melting point on glass transition temperature.
- f) Describe initiation mechanism in free radical polymerisation.

3. Attempt any FOUR of the following: 16

- a) What is commodity plastics ? Give any four examples of commodity plastics.
- b) Describe cationic polymerisation with examples.
- c) Compare emulsion and bulk polymerisation technique.
- d) Explain the relation between molecular weight and degree of polymerisation.
- e) Explain importance of glass transition temperature.
- f) Explain propagation step and termination step in addition polymerisation.

4. Attempt any FOUR of the following: 16

- a) Classify the polymers giving examples.
- b) Describe anionic polymerisation with examples.
- c) Explain schematically the formation of micelles in emulsion polymerisation technique.
- d) Describe osmosis method of determination of average molecular weight of a polymer.
- e) What is polymer degradation ? Explain chain end degradation with a diagram.
- f) Explain the concept of chain transfer reaction. Give examples.

5. Attempt any FOUR of the following: 16

- a) What are engineering plastics ? Enlist any two engineering plastics, stating their applications.
- b) Explain step polymerisation with an example.
- c) Explain suspension polymerisation of styrene.
- d) Explain ultracentrifugation method for determination of average molecular weight of a polymer.
- e) Explain with an example UV degradation of a polymer. How can it be prevented ?
- f) Explain practical significance of average molecular weight of a polymer.

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

- a) Differentiate thermoplastics and thermosetting plastics.
- b) Explain co-ordination polymerisation with initiation, propagation and termination steps.
- c) Define surfactants. Explain their role in emulsion polymerisation.
- d) Explain sedimentation method for determination of average molecular weight of a polymer.
- e) Explain mechanical degradation of polymer. How can it be prevented ?
- f) If a polymer sample has the population as under -
 - 05 molecules of molecular weight each = 5,000
 - 10 molecules of molecular weight each = 7,500
 - 10 molecules of molecular weight each = 10,000
 - 15 molecules of molecular weight each = 15,000
 - 10 molecules of molecular weight each = 20,000
 - 05 molecules of molecular weight each = 25,000Calculate its number average molecular weight
