

17446

21415

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.
 - (8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any TEN of the following:

20

- a) Define:
 - (i) Monomer
 - (ii) Polymer
- b) Name any two commodity plastics and two engineering plastics.
- c) Why is polymer manufactured by anionic polymersation called living polymer?
- d) Define initiator. Name any two initiators.
- e) Define a copolymer. Name any one copolymer.

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- f) Name catalyst used in co-ordination polymerisation and polymer for which it is used.
- g) Write advantages of bulk polymerisation.
- h) Write particle size of an emulsoid and suspensoid.
- i) What do you mean by K value? How is it related to molecular weight?
- j) Why is average molecular weight considered in case of polymer? List types of average molecular weights.
- k) Define glass transition temperature.
- l) Explain importance of glass transition temperature for a polymer.
- m) Name types of polymer degradation.
- n) What is function of chain transfer agent? Name any one chain transfer agent.

2. Attempt any FOUR of the following:

16

- a) Classify polymers with an example of each.
- b) Explain free radical polymerisation with an example.
- c) Differentiate between suspension and emulsion techniques of polymerisation.
- d) Describe “Viscometry” method to measure molecular weight of a polymer.
- e) List factors affecting glass transition temperature. Explain any one with an example.
- f) Describe mechanical degradation of a polymer. Give an example.

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

- a) Define and give two examples, each of:
 - (i) Elastomer
 - (ii) Rubber
- b) Define ionic polymerisation. Explain cationic polymerisation.
- c) Write stepwise method of solution polymerisation techniques of an acrylic.
- d) Describe the “End group analysis” technique to measure molecular weight of a polymer.
- e) How is glass transition temperature of a copolymer measured?
- f) Explain thermal degradation of a polymer, giving an example.

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

- a) Compare thermoplastics and thermosetting plastic. Give an example of each.
- b) Define functionality. Explain its importance in polymerisation, with one example.
- c) Explain bulk polymerisation techniques with an example.
- d) Explain with a diagram cryoscopy method to measure molecular weight of a polymer.
- e) Name the different methods to prevent degradation. Explain any one method.
- f) How is glass transition temperature related to:
 - (i) Melting point
 - (ii) Molecular weight

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

- a) How are copolymers classified? Explain with examples.
- b) Compare chain polymerisation with ionic polymerisation.
- c) Differentiate between free radical and ionic polymerisation.
- d) Explain concept of number average molecular weight and weight average molecular weight of a polymer.
- e) Explain the practical significances of molecular weight with respect to processing of plastic.
- f) Name any one polymer manufactured by:
 - (i) Bulk
 - (ii) Solution
 - (iii) Suspension
 - (iv) Emulsion technique of polymerisation

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

- a) How are polymers different than inorganic compounds?
 - b) What do you mean by step polymerisation? Explain with an example.
 - c) Show with reaction, initiation step in addition polymerisation.
 - d) Define molecular weight distribution of a polymer. Explain its importance.
 - e) Describe method to measure molecular weight of a polymer using osmosis technique.
 - f) Write advantages and disadvantages of emulsion polymerisation.
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