

17446

15116

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) Figures to the right indicate full marks.
(4) Assume suitable data if necessary.
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
(6) Abbreviations used convey usual meaning.

Marks

1. Answer any TEN of the following:

20

- Define a monomer. Give two examples.
- Define block copolymer. Represent it schematically.
- Define functionality. Write functionality of : glycol, terephthalic acid.
- Define 'free radical'. Give two examples.
- What is ionic polymerisation? Name its two types.
- What is polycondensation?
- Why is molecular weight of a polymer obtained by emulsion polymerisation, higher than that obtained by solution polymerisation?
- State any two demerits of bulk polymerisation.
- What is ultracentrifugation? How does it differ from centrifugation? (Write two points only)
- Define cryoscopy and state its two significance.

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- k) Define sedimentation and state its any two industrial requirements.
- l) State any two significances of 'K' value.
- m) Why do polymers show softening range rather than sharp melting point?
- n) State two importances of glass transition temperature.

2. Answer any FOUR of the following: 16

- a) Explain the difference between commodity and engineering plastics (any two points). Write any four applications of engineering plastics.
- b) Explain addition polymerisation with a suitable reaction.
- c) Distinguish between suspension and emulsion polymerisation with suitable examples.
- d) (i) Explain concept of average molecular weight of a polymer.
(ii) Explain the term: polydispersibility factor.
- e) How does glass transition temperature affect the plasticisers? or action of plasticiser?
- f) What is polymer degradation? State in general, its effect.

3. Answer any FOUR of the following: 16

- a) Explain the structure of natural rubber. State its two drawbacks.
- b) Explain chain transfer reactions.
- c) Write stepwise procedure involved in solution polymerisation of an acrylic.
- d) Write the name of "viscometer" used in determination of viscosity average molecular weight of polymers. State precautions to be taken in its use.
- e) Outline use of osmometric method, in determination of average molecular weight of a polymer.
- f) Explain thermal degradation of polymer, with the help of an example.

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

- a) Compare thermoplastics and thermosets giving an example of each.
- b) Explain the basic concept of co-polymerisation with the help of an example. Why are copolymers popular.
- c) Explain with example importance of functionality, in relation to polymerisation.
- d) Distinguish between bulk and solution polymerisation.
- e) Describe sedimentation method.
- f) Explain with reaction, type of degradation in PVC. Name type of degradation. Name types of stabilizers used in PVC composition. Give a specific example.

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

- a) Explain the classification of natural and synthetic polymers.
- b) Distinguish between cationic polymerisation and anionic polymerisation.
- c) State advantages and limitations of suspension polymerisation.
- d) Explain molecular weight distribution in polymers and its effect.
- e) Explain factors influencing glass transitions temperature.
- f) What is oxidative degradation of polymers? Explain the same with a suitable example.

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

- a) What are 'graft copolymers'? Explain the principle involved in their preparation, giving an example.
 - b) Explain the terms:
 - (i) co-ordination polymerisation
 - (ii) step polymerisation
 - c) Distinguish between addition and condensation polymerisation. Give an example of each.
 - d) Explain role of surfactant in emulsion polymerisation. Name types of surfactants used.
 - e) Explain the principle of 'end group analysis'.
 - f) Write Fox's equation. Write the meaning of abbreviations used. Explain use of Fox's equation.
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