

17446

11920

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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) 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 - Polymer and give example.
 - b) State working principle of ultra centrifuge.
 - c) Name the polymer formed by free radical polymerization technique.
 - d) Write down the structural formula for number average molecular weight.
 - e) Define - Elastomer and fiber
 - f) State the importance of melting point for polymer process.
 - g) Enlist any four examples of Thermosetting polymers.
 - h) Define - polymer degradation.
 - i) Which polymerization technique gives living polymer?

P.T.O.

- j) Write down the T_g (glass transition temperature) for following polymer PVC, PS.
- k) Define critical miscelle concentration.
- l) Define condensation polymerization.
- m) State the reason for polymer degradation.
- n) Define - Degree of polymerization.

2. Attempt any FOUR of the following: 16

- a) Distinguish between Thermoplastics and Thermosetting.
- b) Explain polymerization technique that gives polymer in purest form.
- c) Elaborate the following with example
 - (i) Natural plastic
 - (ii) Synthetic plastics
- d) Explain cationic polymerization with suitable example.
- e) Compare bulk polymerization with solution polymerization.
- f) Define functionality. State its role in polymer chemistry.

3. Attempt any FOUR of the following: 16

- a) Write down salient features of commodity plastics and engineering plastic.
- b) Explain in brief various steps in free radical polymerization.
- c) Define - Copolymer. State their classification.
- d) Compare addition polymerization with condensation polymerization
- e) State the name and role of surfactant in emulsion polymerization.
- f) Explain in brief solution polymerization technique.

- 4. Attempt any FOUR of the following:** **16**
- a) Explain propagation step of addition polymerization.
 - b) Describe viscometry method for determination of molecular weight of polymer.
 - c) Explain in brief - polydispersity and molecular weight distribution of polymer.
 - d) State relationship between T_g and T_m (Glass Transition Temp and melting point).
 - e) State merits and demerits of Emulsion polymerization technique.
 - f) Explain step polymerization with suitable examples.
- 5. Attempt any FOUR of the following:** **16**
- a) Describe cryscopic method for determination of molecular weight of polymer.
 - b) State the role of ziegler Natta catalyst in polymerization.
 - c) Explain glass transition temperature and state its importance.
 - d) Explain chain termination methods in free radical polymerization.
 - e) Explain end group analysis method for molecular weight determination.
 - f) State function and examples of different additives used for prevention of polymer degradation.
- 6. Attempt any FOUR of the following:** **16**
- a) Explain different factors affecting the glass transition temperature.
 - b) Explain oxidative degradation of polymer.
 - c) Explain in brief ebullometry.
 - d) Elaborate
 - (i) Number average molecular weight.
 - (ii) Weight average molecular weight.
 - e) Explain in brief concept of K-value.
 - f) Explain mechanical degradation method.
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