24225

3 Hours / 70 Marks   Seat No.

Instructions –   (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer 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 <u>FIVE</u> of the following:**   **10**

a)   Define monomer with an example.

b)   State any two merits of bulk polymerisation technique.

c)   Define homochain polymer with diagram.

d)   State any four techniques used to determine molecular weight.

e)   Define polymer degradation.

f)   State the formula of number average molecular weight of polymer.

g)   Define random degradation of polymer.

Marks

2. **Attempt any THREE of the following:** **12**

   a) Define polymer and state its four examples.

   b) Explain the classification of polymer on the basis of their behaviour.

   c) Define linear and branched polymers with neat diagrams.

   d) Explain co-ordination polymerisation reaction.

3. **Attempt any THREE of the following:** **12**

   a) Define functionality and state the functionality of ethylene and acetylene.

   b) Define degree of polymerisation and state the formula for weight average molecular weight.

   c) State an analytical technique to determine the number average molecular weight and explain that technique in detail.

   d) State an analytical technique to determine the weight average molecular weight of polymer and explain that technique in detail.

4. **Attempt any THREE of the following:** **12**

   a) State any four examples of antioxidants and thermal stabilizers.

   b) Explain the method of mechanical degradation of polymer.

   c) State a relation between glass transition temperature and melting point and derive the relation.

   d) State a relation between molecular weight and degree of polymerisation and explain that relation in detail.

   e) Explain the practical significance of molecular weight.

5. **Attempt any TWO of the following:** **12**

   a) Explain bulk and solution polymerisation technique.

   b) Write a technique for preparation of latex and explain that technique with neat sketch.

   c) Write a polymerisation mechanism for the preparation of 'living' polymer and explain that mechanism in detail.

Marks

6. **Attempt any TWO of the following:** **12**

    a) Explain the effect of plasticizer and molecular weight on the glass transition temperature of a polymer.

    b) Explain random, alternate and block copolymers with neat sketch.

    c) Explain free radical polymerisation in detail with reactions.

————