22230

23242

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 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 FIVE of the following: **10**

a) Enlist the commodity polymers and engineering polymers.

b) Define addition and condensation polymerization.

c) Write the molecular structure of

i) Polyethylene

ii) Polypropylene

d) Define polydisperarity and molecular weight.

e) Enlist various method used to determine the molecular weight of polymers.

f) Write the function of plasticizer with example.

g) List any two stabilizers used in PVC.

Marks

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

a) Classify various type of co-polymers, show the mechanism of each.

b) Discuss with example chain transfer agent and inhibitors.

c) Explain the relation between molecular weight and degree of polymerization.

d) Explain photo degradation with example.

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

a) Explain initiation process of step polymerization with mechanism.

b) Describe with sketch cryoscopy method to calculate the molecular weight.

c) Describe various factor affecting on glass transition temperature.

d) Describe mechanical degradation of PVC, show the mechanism.

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

a) Explain morphology of polymer. Classify the polymer based on morphology (two example of each).

b) Compare addition polymerization with condensation polymerization.

c) Discuss in details suspension polymerization techniques.

d) Discuss the effect of plasticizer on glass transition of co-polymer. Give one example of it.

e) Describe the mechanism for prevention of polymer degradation.

Marks

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

a) Classify various types of polymer on the basis of properties. Write properties and application of each type.

b) Explain co-ordination polymerization. Write initiation, prapogation and termination stages of it.

c) Calculate average molecular weight of given vegetable in table.

Vegetable	Number of units in each entity 'n'	Weight of each unit 'M' (g)	Total weight of each unit W = n*M(g)
Onion	3	12	36
Cabbage	4	20	80
Potato	6	18	108
Brinjal	5	15	75
Total			

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

a) i) Differentiate between thermoplastics and thermoset polymers.

ii) Discuss heat distortion temperature in details.

b) Describe initiation, prapogation and termination with respect to free radical polymerization.

c) i) Compare bulk polymerization with solution polymerization techniques.

ii) Calculate the molecular weight of following polymer if n = 2000.