22230

21718 3 Hours / 70 Marks

1.

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.

	N	larks		
Atte	empt any FIVE of the following :	10		
(a)) Define polymer and co-polymer.			
(b)	Define organic and inorganic polymer.			
(c)	Write advantages of Bulk polymerisation techniques. (Minimum two advantages)			
(d)	Define weight average molecular weight.			

- (e) Enlist any two plasticizer.
- (f) Determine the molecular weight of

$$\mathbf{R} \underbrace{\left(\mathbf{CH}_2 - \mathbf{CH}_1 \right)}_{\mathbf{CH}_3} \mathbf{R}_{150}$$

(g) Define polymer degradation.

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2. Attempt any THREE of the following :

- (a) List any four thermoplastics and thermosetting plastics each.
- (b) Describe with neat sketch ebuliometry method to calculate molecular weight.
- (c) For polypropylene, weight average molecular weight is 36,240 g/mol, calculate the degree of polymerisation of polypropylene.
- (d) Explain solution polymerization technique for styrene.

3. Attempt any THREE of the following :

- (a) Explain types of co-polymer with one example each.
- (b) Justify the relationship between molecular weight and size of polymer with properties.
- (c) State the use of chain transfer agent and inhibitors with one example each.
- (d) Explain the factor affecting on glass transition temperature.

4. Attempt any THREE of the following :

- (a) Differentiate between Bulk polymerisation and suspension polymerisation.
- (b) Explain photodegradation process.
- (c) Explain initiation mechanism in free radical polymerisation.
- (d) Explain mechanical degradation of polymer.
- (e) Explain initiation and propagation in cationic polymerisation.

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5. Attempt any TWO of the following :

(a) If the polymer sample has following data :

Number of molecules Molecular weight

1	5000
3	8200
5	9000
8	87000
10	6500
13	17382
10	1200

Calculate the weight average molecular weight and number average molecular weight.

- (b) Describe initiation, propagation and termination with respect to co-ordination polymerisation.
- (c) Describe relation between glass transition temperature and melting point.

6. Attempt any TWO of the following :

- (a) Describe the procedure and graphical representation to calculate the molecular weight of polymer through Ostwald viscometer.
- (b) State the factor affecting on thermal stability of following polymer with structure :
 - (i) Polycarbonate
 - (ii) Polyphyenylene
 - (iii) Polyethylene oxide
- (c) Classify the polymer on the basis of structure. Explain any three with neat figure.

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