17446

21314

3 Hours / 100 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. Abbreviations used convey usual meaning.

(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. Answer any <u>TEN</u> of the following: **20**

a) Define :

i) polymer

ii) fibre

b) State any two characteristics of ionic polymerisation.

c) Define 'functionality', state functionality of :

i) adipic acid

ii) glycerol

Marks

d) State meaning of addition polymerisation.

e) What is the meaning of critical micelle concentration (CMC)?

f) What is weight average molecular weight? State its formula.

g) Define : Commodity plastics. Give two examples.

h) Define glass transition temperature. State the glass transition temperature of poly (vinyl chloride)

i) Give the classification of polymers.

j) Write the initiation step in free radical polymerisation.

k) Define '$\overline{M}n$', which value is higher '$\overline{M}n$' or '$\overline{M}w$'?

l) Define 'surfactants'. State their role in emulsion polymerisation.

2. Answer any <u>FOUR</u> of the following: **16**

a) Explain the factors influencing the glass transition temperature.

b) What is polymer degradation? Explain with an example, mechanical degradation of polymer.

c) Explain random copolymers.

d) Describe bulk polymerisation technique.

e) Explain use of cryoscopy in determination of average molecular weight of polymer.

f) Differentiate between thermoplastic and thermosetting polymers. Give an example of each.

Marks

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

a) Explain coordination polymerisation with a suitable example.

b) Write stepwise procedure for solution polymerisation of acrylic.

c) Explain importance of glass transition temperature of a polymer.

d) Explain with an example UV degradation of polymer. How can the degradation, controlled?

e) State the principle of ebulliometry. How is it useful in the determination of molecular weight of polymers experimentally?

f) Define 'Viscosity'. State effect of temperature on viscosity. Name a viscometer used in determination of molecular weight of polymer $\overline{M}v$. State precautions to be taken in using the viscometer.

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

a) What is an engineering plastics? Give any four examples of engineering plastics.

b) Explain polycondensation reaction in detail.

c) What is an emulsion polymerisation technique? Give any two merits and two demerits of it.

d) Define a homopolymer and a copolymer. Give any two examples of each.

e) Explain osmosis method for determination of molecular weight of polymers.

f) Explain why are polymers represented by 'average molecular weight' $\overline{M}$? Explain significance of $\overline{M}$.

Marks

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

a) Compare solution and suspension polymerisation techniques on the basis of their merits and demerits.

b) Explain chain transfer reaction.

c) Compare cationic - and anionic - polymerisation.

d) Explain alternate and block copolymers. Represent them schematically.

e) Explain the concept of K-value.

f) Describe the sedimentation method for the determination of molecular weight.

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

a) Explain the concept of co-polycondensation polymerisation.

b) Distinguish : addition polymerisation and condensation polymerisation.

c) Explain the effect of plasticisers on the glass transition temperature.

d) Explain the oxidative degradation of a polymer. Give a specific.

e) Write Carother's equation. Interpret it.

f) How can we prevent the degradation of polymers?

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