[Total No. of Questions - 9] [Total No. of Printed Pages - 2]
(2123)

1394

B. Tech 5th Semester Examination

Polymer & Fiber Science (O.S.)

TE-5006

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt any five questions in all selecting one question from each of section A, B, C & D. Section E is compulsory.

SECTION - A

1. Enlist the various specific features of polymeric materials and on the basis of these discuss their ultimate uses. **(20)**

2. Define homopolymer and copolymer with examples. Discuss and compare the monomers and polymers. State the reasons of popularity of polymeric substances. **(20)**

SECTION - B

3. Explain the chain polymerisation technique with the use of anionic mechanism. **(20)**

4. What is polydispersity? State its significance to characterise a polymer sample. **(20)**

SECTION - C

5. Explain the x-ray diffraction method to determine crystallinity of a semi crystalline fibre. **(20)**

6. What is T_g? State its significance in processing of fibres. **(20)**

SECTION - D

7. Discuss the mechanism of polymer fracture. Also give the factors which influence the strength of polymers. **(20)**

8. Visco-elasticity of polymeric material is a time dependent phenomenon, explain. **(20)**

SECTION - E

9. Answer the following questions.

   (a) What is Ziegler natta catalyst?

   (b) Briefly state the influence of plasticizers on glass transition temperature.

   (c) Define the term 'creep'.

   (d) Enlist the merits and limitations of suspension polymerisation method.

   (e) Define $\overline{M}_n$ & $\overline{M}_w$.

   (f) What are free radicals and how are these formed?

   (g) Differentiate: plastics and fibres.

   (h) Give a relation between intrinsic viscosity [η] and average molecular weight $\overline{M}$.

   (i) Give reasons, why acrylic polymer is not produced by 100% acrylonitrile.

   (j) Briefly state about polycondensation reaction. **(10×2=20)**