

[This question paper contains 3 printed pages.]

Your Roll No. ....

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**M.E. Polymer Technology**

Paper—CH.602

(Polymer Testing and Specification)

*Time : 3 Hours*

*Maximum Marks : 100*

*(Write your Roll No. on the top immediately  
on receipt of this question paper.)*

*Attempt any five questions.*

*All questions carry equal marks.*

1. (a) What is the role of international test organisations for testing and specification of polymeric materials? Name these organisations. 10
- (b) Draw the stress-strain diagram and explain the concepts of yield point, elongation at break, modulus of elasticity and proportional limit. 10
2. (a) What do you understand by tensile strength of a polymer? How can you determine it experimentally? 10
- (b) What is flexural strength of a polymer? How does it differ from tensile strength? Write the various factors which influence flexural strength. 10
3. (a) Define impact strength of a polymer. Discuss the important factors which affect the impact properties of plastics. 10

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- (b) Describe the method of measurement of Izod impact strength. Compare it with Charpy impact method. 10
4. (a) What are Newtonian & non-Newtonian fluids ? Discuss shear viscosity-strain rate curve diagram. Write its important inferences. 10
- (b) Explain the experimental method for the determination of Melt Flow Index (MFI) of a polymer sample. 10
5. (a) Distinguish between permeance and permeability. How will you determine the percentage of moisture in a plastic sample ? 10
- (b) Define Gas Transmission Rate (GTR). How can it be measured experimentally for a polymer sample ? 10
6. (a) Explain the effect of heat, UV light and ozone gas on polymeric materials. 10
- (b) Why amorphous plastics easily catch fire in atmosphere ? Explain the Oxygen Index Test (OIT) for determining the limiting oxygen index of plastics. 10
7. (a) Discuss the terms : Fatigue, Fatigue Endurance and Fatigue Limit for a polymer sample. 10
- (b) Explain the experimental method for the measurement of fatigue strength of a plastic material. What is its significance ? 10

8. Write short notes on any *three* of the following : 20
- (a) Rockwell Hardness;
  - (b) Torque Rheometer;
  - (c) Dielectric Strength;
  - (d) Stress Relaxation;
  - (e) Differential Scanning Calorimetry;
  - (f) Environmental Stress Cracking Resistance Method.