Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CT)/SEM-5/CT-502/2009-10

2009

GLASS – I

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Objective Type Questions)

1. State *True* or *False* for the following : 10 × 1 = 10

   a) Glass transformation must involve a *Tg*.

   b) Laser glass does not need the use of strong light on the sample.

   c) Glass transformation is a thermodynamic process.

   d) Neutron bombardment can transform a crystal into glass.

   e) Rawson's criterion involves energy.

   f) Activation energy of glass transformation can be calculated.

   g) Number of non-bridging oxygen in a glass can be estimated.

h) Fourier transform cannot be used in finding glass structure.

i) Optical absorption does not involve a singularity.

j) Chemical durability test measures Na ions in solution.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Describe Rawson's criterion for glass formation.

3. How to calculate the coordination number of silicon in a silica glass ?

4. Describe details of control aspect in dilatometry measurement.

5. What is the relation between glass transition and an activated process ?

6. Describe chemical durability test in a common soda-lime-silica glass.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. What is the technique for determining Tg ? Draw a sketch and describe details on how process data is transformed into a recorded profile.

8. Explain glass transition by thermodynamics and Kauzman paradox.

9. Write both about thermodynamics & Fourier transform in spinodal decomposition in silicate glasses.

10. What is the philosophy behind the scientific process related to Materials Science for describing Glass Structure by mathematical transform.

11. Write short notes on any *four* of the following :

    a) Vycor glass

    b) Nd-Laser glass

    c) Birefringence in glass

    d) Coordination of boron

    e) Chalcogenide glasses

    f) Amber glass.