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Name :	
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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 :
- $10 \times 1 = 10$
- 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.

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- Fourier transform cannot be used in finding h) structure.
- Optical absorption does not involve a singularity. i)
- Chemical durability test measures Na ions in solution. j)

GROUP - B

(Short Answer Type Questions)

Answer any three of the following. $3 \times 5 = 15$

- 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.
- What is the relation between glass transition and an 5. activated process?
- 6. Describe chemical durability test in a common soda-limesilica glass.

GROUP - C

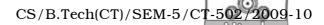
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- What is the technique for determining Tg? Draw a sketch 7. and describe details on how process data is transformed into a recorded profile.
- 8. Explain glass transition by thermodynamics and Kauzman paradox.

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- 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.

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