Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH (CT)/SEM-8/CT-801C/2012

2012

COMPOSITES

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. Answer the following questions : 10 × 1 = 10

   i) Name the proportionality constant of stress-strain relationship on tensile loading.

   ii) For a material of higher Poisson's ratio how lateral dimension will change under a constant elongation under load.

   iii) Define bulk modulus.

   iv) State the mechanism of load transfer from matrix to fibre in a ceramic composite.

   v) What will be preferred orientation of fibre in a fibre composite to obtain maximum strength ?

vi) Why the randomly oriented fibre in a fibre composite results poor strength ?

vii) You are given two stoppers one made of rubber and another of cork. Which one you will recommend for a bottle and why ?

viii) Of polymer matrix ceramic composite and ceramic matrix ceramic comosite, which one will satisfy desired condition of making composite better ?

ix) What are whiskers ?

x) Significance of Ef/Em in fibre composite when Ef & Em signifies usual meaning.

GROUP – B

(Short Answer Type Questions)

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

2. State importance of Poisson's ratio in relation to composites.

3. How elastic modulii changes in a two phase mixture ?

4. Classify different composites with respect to reinforcement.

5. What are different factors to be considered for selection of matrix ?

6. What are different factors to be considered for selection of fibres as a reinforcement material ?

GROUP – C

(Long Answer Type Questions)

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

7. Arrive at an expression relating theoretical strength and observed strength of solid. Why they differ ?

8. Given, $E_{polimer} = 0{\cdot}5\ MNm^{-2}$, $E_{SiO} = 44\ MNm^{-2}$, E_{SiO_2} glass $= 7{\cdot}2\ MNm^{-2}$ and E_{SiC} fibre $= 48\ MNm^{-2}$.

   From the above data how can you proceed to suggest a good composite material ?

9. Discuss various factors responsible for tensile strength development in a fibre composite.

10. What are different methods of making composite ? Give one example in detail.

11. Discuss the importance of fibre matrix interphase in the property manifestation of composites. How these interphases are experimentally studied ?