



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 ?

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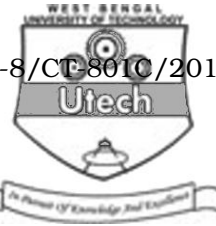
- vi) Why the randomly oriented fibre in a fibre composite results poor strength ?
- vii) You are given two stoppers one made of rubber and another of cork. Which one you will recommend for a bottle and why ?
- viii) Of polymer matrix ceramic composite and ceramic matrix ceramic composite, which one will satisfy desired condition of making composite better ?
- ix) What are whiskers ?
- x) Significance of E_f/E_m in fibre composite when E_f & E_m signifies usual meaning.

GROUP – B

(Short Answer Type Questions)

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

- 2. State importance of Poisson's ratio in relation to composites.
- 3. How elastic moduli 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. $3 \times 15 = 45$

7. Arrive at an expression relating theoretical strength and observed strength of solid. Why they differ ?
8. Given, $E_{\text{polymer}} = 0.5 \text{ MNm}^{-2}$, $E_{\text{SiO}} = 44 \text{ MNm}^{-2}$,
 $E_{\text{SiO}_2 \text{ glass}} = 7.2 \text{ MNm}^{-2}$ and $E_{\text{SiC fibre}} = 48 \text{ MNm}^{-2}$.
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 ?

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