KUMARAGURU
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Register Number:……

M.TECH DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2014)

Second Semester

TEXTILE TECHNOLOGY

P14TXTE06: Textile Composites

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Arrange the elements in sequential order in lay up method [K_1]

   1) Reinforcement 2) Thermosetting matrix and curing agent 3) mould 4) release agent

   a) 2-1-3-4 b) 1-2-3-4

   c) 3-2-4-1 d) 4-3-2-1

2. Modulus ratio (Ef/Em) of PMCs is [K_2]

   a) 10 b) 1

   c) 100 d) 50

3. ---------- composite is used in missile wings [K_1]

   a) PMCs b) CMCs

   c) CCMCs d) MMCs

4. Match the list of symbols and its explanations given below: [K_1]

List I	List II
A. *S*	i. Force applied
B. *F*	ii. Breadth and width
C. *L*	iii. Load
D. *P*	iv. Weibull reliability function

	A	B	C	D
a)	i	iv	iii	ii
b)	iii	iv	ii	i
c)	iv	i	ii	iii
d)	i	iii	iv	ii

5. Assertion (A): Assessment of the creep behaviour of MMCs is a prerequisite for the application of such composites at high temperatures [K_1]

Reason (R): T< 0.5 Tm

a) Both A and R are individually true and R is the correct explanation of A
b) Both A and R are individually true and R is not the correct explanation of A
c) A is True but R is false
d) A is False but R is True

6. Weibull modulus of carbon fibre is [K_2]

a) 5-6
b) 100
c) 10
d) <3

7. Fibre is plastic and matrix is plastic then e_c = [K_2]

a) $E_f + e_m$
b) $E_f = e_m$
c) $E_f - e_m$
d) $E_f < E_m$

8. Damage in composites often begin as tiny cracks. As they grow, they progressively weaken the material until it breaks. To heal such tiny cracks automatically, ------- are sprinkled throughout the fibre glass. [K_1]

a) Capsules of glue
b) Nano particles
c) Nano tubes
d) Resins with nano particles

9. Density of composites = [K_1]

a) Pc= PfVf-PmVm
b) Pc= PfVf+PmVm
c) Pc= PfVf*PmVm
d) Pc= PfVf/PmVm

10. Toughness (K_{ic}) value of Epoxy = [K_1]

a) 100
b) 4-8
c) 80
d) 0.3-0.5

PART B (10 x 2 = 20 Marks)

11. Define laminates and hybrids. [K_1]
12. Name the production routes for MMCs. [K_1]
13. Compare the principle of operation in bag moulding and pultrusion. [K_4]
14. Compare and conclude which composite manufacturing techniques is most widely used and why? [K_4]
15. List the various factors to be considered while deciding design criteria in composite structures. [K_1]
16. Recall the mathematical relationships for direct application to analyse laminate. [K_1]
17. Define fibre volume fraction and angle of orientation. [K_1]
18. Elucidate on fatigue of (i) laminates (ii) hybrids [K_1]

19. Choose the composites suited for aircrafts and aerospace applications and state the reasons for selection. [K_2]

20. Discuss about biomaterial composites and its applications. [K_2]

PART C (6 x 5 = 30 Marks)

21. Compare critically the properties of aramid, glass and carbon fibres. [K_4]

22. Describe the thermoplastic and thermosetting matrices. [K_2]

23. Explain the principle of operation, applications and limitations of lay-up techniques of composite manufacturing. [K_2]

24. Compare the types of winding in composite manufacturing. [K_2]

25. Outline the various interfacial mechanisms. [K_1]

26. Summarize the transfer moulding technique of composite manufacturing. [K_2]

PART D (4 x 10 = 40 Marks)

27. Design a composite on your own choice and discuss the material selection, manufacturing technique and its applications [K_6]

28. Describe the types of composites used in cooling towers and sports goods. Discuss the properties of composites and reasons for their applications. [K_3]

29. Discuss the various mechanics involved in composites. [K_2]

30. Summarize the destructive testing of composite materials. [K_2]

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