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JYOTHI ENGG COLLEGE LIBRARY THRISSUR EDUCATIONAL TRUST CHERUTHURUTHY

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S,FE) Examinations September 2026 (2019 Scheme)

Course Code: MET416
Course Name: COMPOSITE MATERIALS

Max. Marks: 100 **Duration: 3 Hours**

PART A
Answer all questions, each carries 3 marks. **Marks**

1		Define interfacial bonding in composites and list the types of bonding mechanisms.	(3)
2		Explain the concept of smart composites and provide one example of their application.	(3)
3		Describe the fabrication process, properties, and applications of whiskers.	(3)
4		Compare the properties and applications of carbon fibers and boron fibers.	(3)
5		Explain the role of elastomeric polymers in polymer matrix composites.	(3)
6		Describe the autoclave-based processing method and its advantages in composite fabrication.	(3)
7		Explain the liquid infiltration technique used in the production of metal matrix composites.	(3)
8		Describe the properties and applications of titanium-based metal matrix composites.	(3)
9		Explain the hot pressing technique used in the fabrication of ceramic matrix composites.	(3)
10		Explain the significance of the Tsai-Wu failure criterion in the micromechanics of composites.	(3)

PART B
Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	Analyze the role of different types of matrices (polymer, metal, and ceramic) in composite materials and their impact on performance.	(14)

OR

12	a)	Evaluate the role of interfaces in determining the mechanical properties of composite materials.	(14)

Module II

13	a)	Explain with neat sketch fabrication process, properties, and applications of glass fibers.	(14)

OR

14	a)	Explain the advantages, challenges and applications of natural fibers in sustainable composite materials.	(14)

Module III

15	a)	Explain with neat sketch Pressure bag moulding and Vacuum bag moulding processes used in the fabrication of polymer matrix composites.	(14)

OR

16	a)	Design a process flow for the filament winding method used in the fabrication of polymer matrix composites.	(14)

Module IV

17	a)	Analyze the applications of metal matrix composites in aerospace, automotive, and biomedical fields, emphasizing the role of matrix materials in performance improvement.	(14)

OR

18	a)	Evaluate the challenges and solutions in the diffusion bonding process for metal matrix composites.	(14)

Module V

19	a)	Analyze the key properties and applications of ceramics as matrix materials in high-performance composite structures with examples.	(14)

OR

20	a)	Describe the maximum strain criterion and explain its significance in the micromechanics of composites.	(14)

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