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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R) Examinations April 2026 (2024 Scheme)

Course Code: PEMET413
Course Name- COMPOSITE MATERIALS

Max. Marks: 60 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 3 marks)

		CO	Marks
1	Define smart composites and state their significance in engineering applications.	CO1	(3)
2	State the advantages of natural fibers. List the natural fibers used in composites.	CO1	(3)
3	List the advantages of using polymer matrix composites in engineering applications	CO2	(3)
4	Differentiate thermoset and thermoplastic matrices in composites.	CO2	(3)
5	Narrate the role of alloys as matrix materials in composites.	CO3	(3)
6	List the important parameters affecting the melt stirring technique used for MMC production.	CO3	(3)
7	Highlight the distinguishing features of the *in situ* chemical technique in composite fabrication.	CO4	(3)
8	Write down the advantages and disadvantages of the Lanxide process of composite manufacturing.	CO4	(3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module -1

			CO	Marks
9	a)	Discuss the types of bonding at the fiber–matrix interface with neat sketches.	CO1	(6)
	b)	Describe the functions of matrix and reinforcement in composites.	CO1	(3)
10	a)	With the help of a suitable sketch, explain the fabrication process of glass fiber in detail.	CO1	(6)
	b)	List out the industrial applications of composites.	CO1	(3)

Module -2

11		Explain the spray lay-up method in PMC fabrication with a neat sketch. Mention the advantages and limitations.	CO2	(9)
12		Describe the pultrusion process for PMCs with a neat diagram, and identify typical matrix and reinforcement materials used in PMCs.	CO2	(9)

Module -3

13	a)	Describe the pressure-assisted liquid infiltration process used in MMC fabrication with a neat sketch, and explain its significance.	CO3	(6)
	b)	Compare the advantages of metal matrix composites over polymer matrix composites.	CO3	(3)
14	a)	Explain the squeeze casting technique for MMC production with a neat sketch.	CO3	(6)
	b)	List out the characteristics of metals that make them appropriate for use as matrix materials in MMCs.	CO3	(3)

Module -4

15	a)	Explain the liquid infiltration method used in the fabrication of ceramic matrix composites using a neat sketch.	CO4	(6)
	b)	List out the applications of CMCs.	CO4	(3)
16	a)	Describe the sol-gel technique for the fabrication of CMCs using a neat sketch.	CO4	(6)
	b)	Explain the benefits of reaction bonding techniques in the fabrication of CMCs.	CO4	(3)

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