

C
00G-ZMLX0



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (R,S) Examinations April 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 composite materials and list their key characteristics. | (3) |
| 2 | Explain the concept of wettability and its role in bonding at composite interfaces. | (3) |
| 3 | Describe the structure, properties, and applications of boron fibers. | (3) |
| 4 | Compare the fabrication processes of Ex-PAN carbon fibers and Ex-Pitch carbon fibers | (3) |
| 5 | Differentiate between thermoset and thermoplastic polymers in terms of their properties and applications as matrix materials. | (3) |
| 6 | Explain the spray-up method used in the fabrication of polymer matrix composites. | (3) |
| 7 | Describe the powder metallurgy technique used in the production of metal matrix composites. | (3) |
| 8 | Explain the role of intermetallics as matrix materials in metal matrix composites. | (3) |
| 9 | Explain the reaction bonding technique used in the fabrication of ceramic matrix composites. | (3) |
| 10 | What is the significance of the maximum stress 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) Classify composites based on structure and provide examples for each type. (14)

OR

- 12 a) Evaluate the industrial applications of smart composites and their future potential. (14)

Module II

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

OR

- 14 a) What are the advantages and disadvantages of natural fibers used in sustainable composite materials? (10)
- b) Mention few applications of composite materials made with natural fiber as reinforcement. (4)

Module III

- 15 a) Explain with neat sketch autoclave-based processing method for polymer matrix composites and its advantages over other methods. (14)

OR

- 16 a) Explain with neat sketch the pultrusion method used in the fabrication of polymer matrix composites. (10)
- b) Mention few features of pultrusion method. (4)

Module IV

- 17 a) Explain with neat sketch the squeeze casting technique used in the production of metal matrix composites and its advantages. (14)

OR

- 18 a) Evaluate the challenges and solutions in the liquid infiltration process for metal matrix composites. (14)

Module V

- 19 a) Explain with neat sketch the Lanxide process for ceramic matrix composites and its industrial applications. (14)

OR

- 20 a) Describe Tsai-Wu failure criteria for composites and explain its significance in the micromechanics of composites. (14)
