

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
V SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: MR365

Course Name: COMPOSITE MATERIALS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

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|---|---|---|
| 1 | What is composite materials? Why conventional materials are replaced with composite materials? | 5 |
| 2 | Explain importance of fabrication processes in composite materials and with neat sketch explain hand layup process? | 5 |
| 3 | Explain about experimental characterisation of compression test and sketch the diagrams if required? | 5 |
| 4 | Why newly designed product require mechanical testing. Explain? | 5 |
| 5 | What is special laminates? Why special laminates are different from ordinary one? | 5 |
| 6 | Whether destructive testing helps to increase the production rate? Explain? | 5 |
| 7 | Elucidate about what is the difference between conventional materials and composite materials? | 5 |
| 8 | Elucidate why carbon fibers are widely used in sports cars? | 5 |

PART B

Answer any three questions, each carries 10 marks.

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|----|---|---|
| 9 | a) Explain the manufacturing process of glass fibers and highlight its advantages? | 7 |
| | b) Write short note about continuous fibers? | 3 |
| 10 | a) Explain fabrication process of diffusion bonding process? | 6 |
| | b) Write short note on ceramic metal matrix composites? | 4 |
| 11 | a) With neat sketch explain experimental characterisation of uniaxial tension? | 6 |
| | b) List the advantages of destructive testing? Do you prefer destructive testing method? Why destructive testing is so important? | 4 |
| 12 | a) Explain the difference between destructive testing and non-destructive testing briefly? | 5 |
| | b) Explain acoustic emission testing method? | 5 |

13 a) Investigate why mechanical testing is so important in the field of composite? 5
Explain inter laminar fracture toughness?

b) With neat sketch explain ultrasonic testing methods? 5

PART C

Answer any two questions, each carries 15 marks.

14 a) List the advantages of the special laminates? And highlight its characteristics? 8

b) Suggest a composite materials used in the manufacturing of rocket nose cone and 7
explain its significance?

15 a) Explain and suggest an idea associated with composite materials helps to reduce 8
the weight of a passenger car?

b) Differentiate between quasi-isotropic laminates and cross-ply laminates? 7

16 a) With neat sketch explain symmetric laminates and unidirectional laminates? 6

b) Explain quasi and angle ply laminates? 9

17 a) What is carbon/carbon composites? Explain? 5

b) Explain why defence research team is very much interested to implement 10
composite materials in their equipment? Explain recent composite material trends
used in defence industry?