

**APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY**  
**08 PALAKKAD CLUSTER**

Q. P. Code :MD0819042- I

(Pages:2)

Name .....

Reg. No:.....

**SECOND SEMESTER M.TECH. DEGREE EXAMINATION APRIL 2019**

**Branch: Mechanical Engineering**

**Specialization: Machine Design**

**08ME6042(A)COMPOSITE MATERIALS**

**Time:3 hours**

**Max. marks: 60**

**Answer all six questions.**

**Modules 1 to 6:**Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

<b>Q.no</b>	<b>Module 1</b>	<b>Marks</b>
.		
<b>1.a</b>	What is a composite material	<b>3</b>
	<b>Answer b or c</b>	
<b>b</b>	Explain in detail about smart materials, types and features	<b>6</b>
<b>c</b>	How do we classify composites based on reinforcements	<b>6</b>
<b>Q.no.</b>	<b>Module 2</b>	<b>Marks</b>
<b>2.a</b>	Differentiate Isotropic, Anisotropic and orthotropic materials	<b>3</b>
	<b>Answer b or c</b>	
<b>b</b>	What are the characteristics of fibre reinforced laminates	<b>6</b>
<b>c</b>	Explain about the various methods of improving damage tolerance	<b>6</b>
<b>Q.no.</b>	<b>Module 3</b>	<b>Marks</b>
<b>3.a</b>	What are the main characteristics of filament winding	<b>3</b>
	<b>Answer b or c</b>	
<b>b</b>	Explain about the composite manufacturing method – bag moulding process	<b>6</b>
<b>c</b>	What is compression moulding, elaborate the method with the help of a schematic diagram	<b>6</b>

<b>Q.no.</b>	<b>Module 4</b>	<b>Marks</b>
<b>4.a</b>	what is lamination theory and mention its uses	<b>3</b>

**Answer b or c**

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|----------|--|----------|
| <b>b</b> | How do we analyse stresses on a laminated composite plate  | <b>6</b> |
| <b>c</b> | Explain in detail about the mechanical testing of composite shell material for a pressure vessel | <b>6</b> |

<b>Q.no.</b>	<b>Module 5</b>	<b>Marks</b>
<b>5.a</b>	what are the factors to be considered in the prediction of reliability of composites	<b>4</b>

**Answer b or c**

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|----------|--|----------|
| <b>b</b> | what are the general steps to be done to solve a problem using Finite element analysis | <b>8</b> |
| <b>c</b> | What are the constraints in the analysis of a sandwich structured composite material   | <b>8</b> |

<b>Q.no.</b>	<b>Module 6</b>	<b>Marks</b>
<b>6.a</b>	why don't we recommend the conventional failure theories to predict the failure of composite material	<b>4</b>

**Answer b or c**

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|----------|---|----------|
| <b>b</b> | What are the things to be considered while designing a laminate composite   | <b>8</b> |
| <b>c</b> | Differentiate between the bolted and bonded joints in the field of composites in detail with the help of sketches | <b>8</b> |