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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## May 2023 Semester End Main Examinations

**Programme: B.E.**

**Branch: Aerospace Engineering**

**Course Code: 22AS3PCMAE**

**Course: Materials for Aerospace Engineering**

**Semester: III**

**Duration: 3 hrs.**

**Max Marks: 100**

**Date: 17.05.2023**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
 2. Missing data, if any, may be suitably assumed.  
 3. Draw Diagrams wherever necessary

### UNIT - I

1	a) What are the most widely used materials for Aircraft construction? <span style="float: right;">4</span>
	b) Explain polymer with suitable examples? What are the different types of polymers and their uses? <span style="float: right;">8</span>
	c) Explain briefly the corrosion resistant materials and methods used in aircrafts. <span style="float: right;">8</span>

### OR

2	a) Write a note on thermal protection and materials used for it. <span style="float: right;">8</span>
	b) Write a brief note on emerging trends in aerospace materials and also list the newer trends required in aerospace constructions? <span style="float: right;">5</span>
	c) What are intermetallics? Explain <span style="float: right;">7</span>

### UNIT - II

3	a) Write note on Aluminium and list the grade of aluminum alloy used in aircraft industry, also enumerate their properties? <span style="float: right;">10</span>
	b) Write note on titanium and what is the composition of typical titanium alloy? Also, list the various parts prepared using titanium in aerospace applications. <span style="float: right;">10</span>

### OR

4	a) List different types of heat treatments of Aluminium alloy and also write a note on surface treatments. <span style="float: right;">10</span>
	b) Write note on Welding and Machining Titanium alloys. <span style="float: right;">5</span>
	c) What are different copper alloys used in aerospace industry. <span style="float: right;">5</span>

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

### **UNIT - III**

5	a) Enumerate the role of ferrous materials in aircraft constructions?	<b>5</b>
	b) Write note on maraging steels.	<b>5</b>
	c) Write a note on Iron and cobalt based super alloys.	<b>10</b>

### **UNIT - IV**

6	a) List the traditional ceramics and the most modern advanced ceramic materials	<b>6</b>
	b) With neat sketch explain the fabrication process of injection moulding for MMC.	<b>8</b>
	c) Write note on polymer composites applications in aerospace vehicle design.	<b>6</b>

### **UNIT - V**

7	a) With neat sketch explain different between linear and non-linear elastic properties.	<b>8</b>
	b) With neat sketch explain Bauschinger's effect.	<b>8</b>
	c) Write brief note on characterization at high temperature	<b>4</b>

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