U.S.N.										

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

Autonomous Institute Affiliated to VTU

April 2024 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Aerospace Engineering **Duration: 3 hrs.**
Course Code: 19AE3DCMAE **Max Marks: 100**
Course: Materials for Aerospace Engineering

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

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 - I

1	a)	By listing the important Aerospace materials, state the reasons for them to be selected as Aerospace material.	**8**
	b)	Give the classification of plastics stating their properties and applications.	**8**
	c)	What are shape memory alloys? Quoting an example discuss its possible applications.	**4**

OR

2	a)	What are intermetallics? Discuss any two intermetallics detailing about their composition and temperature limits.	**8**
	b)	Why is corrosion effects so important for Aerospace industry? State the methods to avoid corrosion of Aircraft components.	**6**
	c)	State and discuss the methods for achieving stealth of military aircrafts.	**6**

UNIT - II

3	a)	List the advantages of aluminium and its alloys in favor of aerospace applications.	**6**
	b)	Discuss in detail the composition, heat treatments and typical applications of any two age-hardenable aluminium alloys.	**8**
	c)	How are Magnesium and its alloys classified? State their properties and applications.	**6**

OR

4	a)	State the distinct composition and properties of two types of titanium alloys.	**7**
	b)	Bring out the applications of titanium and its alloys in aircrafts.	**7**
	c)	List the alloys of Copper. State the applications of copper and its alloys in aircrafts.	**6**

UNIT - III

5	a)	Classify steels based on composition and state their typical applications.	**7**
	b)	Explain formation of different phases of steel with an iron-carbon diagram.	**8**
	c)	What are the required properties of superalloys? List them.	**5**

UNIT - IV

6	a)	List the modern ceramics. Bring out the properties and applications of ceramics.	**7**
	b)	State and discuss different methods of achieving stealth in aircrafts.	**7**
	c)	Give a detailed classification of polymer matrix composites.	**6**

UNIT - V

7	a)	With a stress-strain diagram, explain the linear and non-linear behavior of the material. Also mark the salient points on the curve.	**6**
	b)	What is strain hardening? Discuss its positive and negative effects on the material properties.	**7**
	c)	With a neat diagram, explain any one sub-surface flaw detection method.	**7**

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