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: 23AS3PCMAE **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	CO	PO	Marks
1	a)		Summarize important Aerospace materials & their properties	CO1	PO1	8
	b)		Illustrate the use of different Polymers in the aircraft construction	CO1	PO1	6
	c)		List and state the properties of intermetallics.	CO1	PO1	6
			OR			
2	a)		Write a note on i) Corrosion resistant materials used in aircrafts ii) Achieving of stealth in aircrafts	CO1	PO1	8
	b)		List and discuss materials and methods used for thermal protection in Aerospace industry	CO1	PO1	8
	c)		What are shape memory alloys? Discuss	CO1	PO1	4
			UNIT-II			
3	a)		With classification, state the composition, properties and applications of age-hardenable and non-age hardenable aluminum alloys.	CO2	PO2	10
	b)		List and explain the various heat treatment processes of aluminum alloys.	CO2	PO1	6
	c)		State the properties of Titanium which makes them readily used in Aerospace industry.	CO2	PO1	4
			OR			
4	a)		Differentiate alpha and beta Titanium alloys in terms of their composition, crystal structure and properties. Also state the typical application of each of these alloys.	CO2	PO2	10
	b)		Outline the classification and applications of copper and its alloys.	CO2	PO1	6

		c)	How are the properties affected with age-hardening? Discuss	*CO2*	*PO2*	**4**
			UNIT-III			
	5	a)	Outline the properties & application of Maraging Steels in Aerospace industry.	*CO2*	*PO1*	**6**
		b)	Stating the categories of Superalloys discuss their composition, temperature limits and applications.	*CO3*	*PO2*	**9**
		c)	What are hypo-eutectic and hyper-eutectic steels? Discuss	*CO2*	*PO1*	**5**
			UNIT - IV			
	6	a)	List and state the properties and applications of ceramics	*CO3*	*PO1*	**7**
		b)	With illustration explain a fabrication process involved in making of metal matrix composites.	*CO3*	*PO1*	**6**
		c)	What are polymer matrix composites? Give examples. Also list the various applications of composites.	*CO3*	*PO2*	**7**
			UNIT - V			
	7	a)	Illustrate about the elastic after effect with a neat diagram	*CO1*	*PO1*	**6**
		b)	With a stress-strain diagram, discuss the following phenomenon. i) Yielding ii) Linear behavior iii) Non-linear behavior iv) Elastic and plastic behavior.	*CO1*	*PO1*	**8**
		c)	Sketch and explain any one surface defect detection method.	*CO1*	*PO2*	**6**

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