

Code No: R203103C

R20

III B. Tech II Semester Regular/Supplementary Examinations, April -2025
Advanced Materials
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

		UNIT-I	
1.	a)	Explain the effect of microstructure of superalloys on creep properties.	[7M]
	b)	What characteristics of aluminium and its alloys account for its versatility in uses? Explain any two hardenable Al alloys.	[7M]
		(OR)	
2.	a)	Explain the microstructure and applications of (i) alpha (ii) near alpha (iii) alpha+beta (iv) beta and (v) near beta titanium alloys.	[7M]
	b)	What is the important property required to use the metals/alloys in cryogenic applications? Explain any two metals/alloys used for cryogenic applications.	[7M]
		UNIT-II	
3.	a)	Explain characteristics and typical applications of any four plastic materials	[7M]
	b)	Write briefly on ceramic powder processing.	[7M]
		(OR)	
4.	a)	Compare the mechanical behaviour of ceramics with metals.	[7M]
	b)	Explain any one processing technique of plastics.	[7M]
		UNIT-III	
5.	a)	Write short notes on effect of Volume fraction of reinforcement in composites.	[7M]
	b)	What are the different types of fibers are used in composites? Explain about any three.	[7M]
		(OR)	
6.	a)	What are the general types of matrix materials? Explain about any three	[7M]
	b)	What are the characteristics and limitations of metal matrix composites?	[7M]
		UNIT-IV	
7.	a)	What is a shape memory alloy? How it differs from conventional materials?	[7M]
	b)	What are the different types of functionally graded materials? Explain in brief.	[7M]
		(OR)	
8.	a)	What are the two types of shape memory alloys? Explain with example.	[7M]

	b)	Explain any one method to prepare functionally graded materials.	[7M]
		<u>UNIT-V</u>	
9.	a)	Explain the characteristics of Nano Particles, Nano wires and Nano tubes	[7M]
	b)	Narrate the limitations and advantages of nano materials	[7M]
		(OR)	
10.	a)	Explain applications of nano materials with suitable example	[7M]
	b)	Classify nanomaterials based on their composition, dimensions, or morphology.	[7M]

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