#### 02000MET296062203

Reg No.:\_\_\_

Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSIT

B.Tech S4 (Hons.) Exam May 2025 (2023 Admn)

# Course Code: MET296

## **Course Name: MATERIALS IN MANUFACTURING**

Max. Marks: 100

Duration: 3 Hours

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Pages: 2

## PART A

	(Answer all questions; each question carries 3 marks)	Marks
1	Explain chemical bonding.	(3)
2	What are the characteristics of miller indices?	(3)
3	Explain the characteristics of high temperature material.	(3)
4	Write short notes on Vacuum Arc Remelting.	(3)
5	Explain the properties of cast super alloys.	(3)
6	Explain the phases in superalloys.	(3)
7	What are the applications of niobium alloys?	(3)
8	Write short notes on heat treatment of Titanium alloys.	(3)
9	Explain the properties of molybdenum.	(3)
10	Explain Hume-Rothery Phase Rule.	(3)
	PART B	
	(Answer one full question from each module, each question carries 14 marks)	

#### Module -1

11	a)	What are the different dislocations in metal structure?	(6)
	b)	Explain frank-read source in crystal structure.	(8)
12	a)	Explain the structural deformation characteristics in high temperature material.	(8)
	b)	What are the different primary bonds in materials?	(6)
		Module -2	

13	2)	Explain Larson-Mille	r approach for the ranking of creen per	formance (14)
15	a)	Explain Laison-Mine	approach for the ranking of creep per	(1+)

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14	a)	What are the different characteristics of vacuum induction melting?	(8)
	b)	Explain Electroslag Remelting.	(6)
		Module -3	
15		Explain the crystal structure of Iron-Nickel Base superalloys.	(14)
16	a)	Explain about different elements producing oxidation and hot corrosion resistance.	(8)
	b)	Explain the strengthening mechanism in Carbide-Boride structure.	(6)
		Module -4	
17	a)	Explain the machining and welding characteristics of Titanium alloys.	(8)
	b)	What are the properties of Titanium aluminides?	(6)
18		Explain the creep performance characteristics of single crystal super alloys.	(14)
		Module -5	
19		Explain the effect and application of Molybdenum alloying in materials.	(14)
20	a)	What are the effects of Austenite to Martensite transformation?	(8)
	b)	Explain the application of cobalt free maraging steel.	(6)

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