

Code No: P21MET01

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)
II B.TECH ISEMESTER END REGULAR EXAMINATIONS, JAN - 2023
METALLURGY & MATERIAL SCIENCE
(ME Branch)

Time: 3 hours

Max. Marks: 70

Answer all the questions from each UNIT (5X14=70M)

Q.No.	Questions	Marks	CO	KL
UNIT-I				
1.	a) Derive the atomic packing factor for BCC and FCC unit cells	[7M]	1	
	b) Explain the Hume-Rothery principles in developing solid solution alloys	[7M]	1	
OR				
2.	a) Classify intermediate alloy phases with examples	[7M]	1	
	b) Explain different grain size measurement techniques in detail?	[7M]	1	
UNIT-II				
3.	a) Explain i) Gibb's phase ii) Isomorphous and ii) Eutectic systems	[7M]	2	
	b) Draw Iron-Iron carbide equilibrium diagram and discuss each zone	[7M]	2	
OR				
4.	a) Write short notes on i) cementite ii) ferrite and ii) pearlite in Fe-Fe ₃ C system	[7M]	2	
	b) Construct Cu-Ni phase diagrams and explain all the phases	[7M]	2	
UNIT-III				
5.	a) Discuss the structure and applications of plain carbon steels	[7M]	3	
	b) How the cast irons are different from steels? Explain with examples	[7M]	3	
OR				
6.	a) Discuss i) tool steels and ii) die steels and write their applications	[7M]	3	
	b) Why malleable cast iron has more applications compared with white cast iron? explain	[7M]	3	
UNIT-IV				
7.	a) Discuss the austenitic transformation during the hardening of low carbon steels	[7M]	4	
	b) Write brief notes on Magnesium alloys and their applications	[7M]	4	
OR				
8.	a) What is the necessity of surface hardening of steels? Explain any two surface hardening method	[7M]	4	
	b) Classify Ti alloys and discuss their potential applications	[7M]	4	
UNIT-V				
9.	a) Discuss i) crystalline ceramics and ii) Abrasive materials	[7M]	5	
	b) How the composites are classified based on the reinforcing materials? Explain	[7M]	5	



OR					
10.	a)	Explain manufacturing methods of Cermets and list the applications	[7M]	5	
	b)	Discuss the industrial applications of composite materials	[7M]	5	
