

Code No: P21MET01

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE  
(AUTONOMOUS)

II B.TECH ISEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 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) Draw the basic crystal structure and label all the unit cell parameters	[7M]	1	
	b) Write brief notes on i) solid solution alloys and ii) compounds	[7M]	1	
OR				
2.	a) Discuss the solidification behavior of crystalline materials	[7M]	1	
	b) What are the Hume-Rothery principles? Explain	[7M]	1	
UNIT-II				
3.	a) Explain the methods used to develop phase diagrams in detail	[7M]	2	
	b) With a neat diagram, discuss the different phase reactions which appear on the Fe-Fe <sub>3</sub> C phase diagram	[7M]	2	
OR				
4.	a) Discuss i) Austenite, ii) Martensite and iii) Bainite	[7M]	2	
	b) Explain the phase reaction with examples: i) Eutectic and ii) Peritectic	[7M]	2	
UNIT-III				
5.	a) How the alloy steels exhibit better properties compared with plain carbon steels? Discuss	[7M]	3	
	b) Classify the cast irons and which cast iron is suitable for manufacturing machine tool beds? Why?	[7M]	3	
OR				
6.	a) Discuss i) Stainless steels and ii) Manganese steels	[7M]	3	
	b) Write brief notes on structure and composition of Malleable cast irons	[7M]	3	
UNIT-IV				
7.	a) Explain i) Annealing and ii) Normalizing heat treatment of steels	[7M]	4	
	b) Write the classification of Aluminium alloys and their industrial applications	[7M]	4	
OR				
8.	a) Draw TTT diagram of 0.8%C steel and discuss the important regions	[7M]	4	
	b) Classify Cu alloys and write their potential industrial applications	[7M]	4	
UNIT-V				
9.	a) Write brief notes on i) crystalline ceramics and ii) glasses	[7M]	5	
	b) Classify composite materials and list the potential applications	[7M]	5	
OR				
10.	a) Discuss in detail the applications of ceramic materials	[7M]	5	
	b) Write brief notes on i) Metal matrix composites and ii) polymer matrix composites	[7M]	5	

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