

Code No: P18MET02

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HALL TICKET NUMBER

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

II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 2023
METALLURGY & MATERIAL SCIENCE
(Common to ME, AME Branches)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answer all the questions in Part-A (5X2=10M)

Q.No.	Questions	Marks	CO	KL
1	a) Differentiate amorphous and crystalline materials	[2M]	1	
	b) Write Gibb's phase rule and explain	[2M]	2	
	c) Write short notes on gray cast iron and its applications	[2M]	3	
	d) List the applications of annealing heat treatment	[2M]	4	
	e) What are the Cermets and write their applications	[2M]	5	

PART-B

Answer One Question from each UNIT (5X10=50M)

Q.No.	Questions	Marks	CO	KL
UNIT-I				
2.	a) Explain the nucleation and crystal growth during the sollicitation of pure metals	[5M]	1	
	b) Discuss the types of solid solution alloys with examples	[5M]	1	
OR				
3.	a) Derive atomic packing factor for BCC crystal structure	[5M]	1	
	b) What is the necessity of alloying ? and example electron compound with examples	[5M]	1	
UNIT-II				
4.	a) Draw Cu-Ni binary phase diagram and explain all the zones	[5M]	2	
	b) Explain Isomorphus binary system with a neat diagram	[5M]	2	
OR				
5.	a) Write brief notes on i) eutectoid and ii) peritectoid reactions in binary alloys	[5M]	2	
	b) Discuss different phase reactions appear in Fe-Fe ₃ C phase diagram	[5M]	2	
UNIT-III				
6.	a) Discuss briefly the industrial applications of alloy steels	[5M]	3	
	b) Write brief notes on structure and properties of white cast iron	[5M]	3	
OR				
7.	a) Discuss the promising properties of Manganese steels and the applications	[5M]	3	
	b) Compare the structural difference of steels and cast irons	[5M]	3	
UNIT-IV				
8.	a) Why heat treatment of steels is carried out? Discuss the important benefits	[5M]	4	
	b) Draw TTT diagram for 0.8% carbon steel and explain each zone	[5M]	4	

OR					
9.	a)	Why normalized steels are stronger and harder? explain	[5M]	4	
	b)	Explain the carburizing process in detail	[5M]	4	
UNIT-V					
10.	a)	Discuss the applications of composite materials with examples	[5M]	5	
	b)	Discuss the important steps involved in developing components by powder metallurgy	[5M]	5	
OR					
11.	a)	Classify the composite materials based on the reinforcing materials	[5M]	5	
	b)	What are the advantages and limitations of powder metallurgy?	[5M]	5	
