PVP 20

Code: 20ES1303

II B.Tech - I Semester – Regular / Supplementary Examinations
DECEMBER 2023

MATERIAL SCIENCE AND METALLURGY
(MECHANICAL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1		Discuss about the Mechanical and Technological Properties of Engineering Materials.	L2	CO1	14 M
OR					
2		Describe the various imperfections in crystals and their effects on properties.	L2	CO1	14 M
UNIT-II					
3	a)	What is single component phase diagram? Explain with suitable neat diagram.	L2	CO2	7 M
	b)	Tabulate types of reactions in binary phase diagrams.	L2	CO2	7 M
OR					
4		Draw and explain the Fe-Fe_3C phase diagram and invariant reactions.	L2	CO2	14 M

UNIT-III					
5	a)	What are heat treatment processes? Explain briefly.	L2	CO3	7 M
	b)	Draw a diagram of critical cooling rate on TTT diagram and briefly explain it.	L2	CO3	7 M
OR					
6		What are TTT diagrams? How they are prepared? What is their significance?	L2	CO3	14 M
UNIT-IV					
7		Explain the structure and properties of white cast iron.	L2	CO4	14 M
OR					
8		Evaluate Grey cast iron structure and properties.	L2	CO4	14 M
UNIT-V					
9		What is meant by composite material? Explain its merits along with applications and explain the special features of metal matrix composite over polymer matrix composite.	L2	CO5	14 M
OR					
10	a)	Explain the structure and properties of Aluminum and its alloys.	L2	CO5	7 M
	b)	List out the types of Titanium Alloys and its applications.	L2	CO5	7 M