



**NAVVRACHANA
UNIVERSITY**
a UGC recognized University

School: School of Engineering and Technology
Program/s: B.Tech Mechanical
Year: 2nd **Semester:** 3rd
Examination: End semester Examination
Examination year: November – 2023

Course Code: ME 206 **Course Name:** Engineering Metallurgy
Date: 23/11/2023
Time: 1:00 pm to 3:00 pm

Total Marks: 40
Total Pages: 01

Instructions:

- Write each answer on a new page.
- Use of a calculator is permitted/not permitted

Q. No.1	Attempt any SIX questions.	Marks (36)	COs'	BTL#
1.	What is case hardening? Explain any two methods for case hardening in steel.		C02	BT1, BT2
2.	Briefly explain with a suitable sketch about working principle of the most efficient technique to test thick nonferrous material.		C03	BT 1, BT 3
3.	Distinguish the annealing and normalizing process in steel.		C02	BT 2,
4.	What is the significance of the Time Temperature Transformation (TTT) diagram in the heat treatment of steel? Draw the diagram for eutectoid steel and explain the critical cooling rate in steel.		C02	BT 2, BT-4
5.	Write the steps to manufacture the component by powder metallurgy.		C03	BT 1, BT 2
6.	Define hardenability. Describe any one test procedure to determine the hardenability of steel with neat sketch.		C03	BT-1 BT 3
7.	Write a short note on High-Speed Steel.		C03	BT1, BT 2
Q.No. 2	Answer the following.	Marks(4)		
A.	How to generate the X-rays? Illustrate the principles of Radiography.		C02	BT 2
B.	What are the reactions in the iron-carbon phase diagram?		C01	BT 2, BT 4

*****End of Question Paper*****