GUJARAT TECHNOLOGICAL UNIVERSITY
B.VOC- SEMESTER–II EXAMINATION – SUMMER 2022

Subject Code:21120304   **Date:02-08-2022**
Subject Name:Material Science and Metallurgy
Time:10:30 AM TO 12:30 PM   **Total Marks:50**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	(a)	Explain any five mechanical properties.	05
	(b)	Discuss selection criteria for materials used in engineering applications.	05
Q.2	(a)	What is solid solution? Briefly explain types of it with neat sketch.	05
	(b)	What is the difference between Hot working and Cold working.	05
		OR	
	(b)	Write short notes on Recovery, Recrystallization and Grain growth.	05
Q.3	(a)	State critical reactions of Iron-carbon phase Diagram.	05
	(b)	What are the effects of alloying chromium, nickel, molybdenum, and carbon in steels?	05
		OR	
Q.3	(a)	Draw & Explain Iron-Iron Carbide Diagram with all regions.	05
	(b)	Write short note on Gray Cast Iron.	05
Q.4	(a)	Explain the NDT method widely used for inspection of castings.	05
	(b)	Explain magnetic particle testing (MPT) method with neat sketch. Also explain its benefits and limitations.	05
		OR	
Q.4	(a)	Describe Ultarsonic Test principle and advantages.	05
	(b)	List the characteristics required in dye material for dye penetration testing.	05
Q.5	(a)	Define Heat Treatment and classify heat treatment processes.	05
	(b)	Difference between Annealing Process and Normalizing Process.	05
		OR	
Q.5	(a)	Define hardenability and list three factors affecting it	05
	(b)	Justify the need of Heat treatment processes for metals. Explain with neat sketch TTT diagram for heat treatment of steel.	05

****