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Question Paper Code	12932
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fifth Semester

Mechanical and Automation Engineering
20MUPE505 - MATERIALS FOR ENGINEERING

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. Draw a typical cooling curve of pure metal and a solid solution.	2	K1	CO1
2. State Gibb's phase rule.	2	K1	CO1
3. List the important properties of HSLA.	2	K1	CO2
4. What are the effects of addition of boron, chromium and cobalt in steels?	2	K1	CO2
5. Define Recrystallisation.	2	K1	CO3
6. What are the factors which affect cooling rate in TTT Diagram?	2	K1	CO3
7. Define the term "Degree of Polymerization".	2	K1	CO4
8. What is meant by PSZ?	2	K1	CO4
9. List the importance of shape memory alloys.	2	K1	CO5
10. State the principle of piezoelectricity.	2	K1	CO5

PART - B (5 ×16 = 80 Marks)

Answer Any FIVE Questions

1. Explain with a neat sketch of Iron-Iron carbide equilibrium diagram and indicate all the phases. Also write the three important invariant reactions.	16	K2	CO1
2. Explain Age Hardening of Al-Cu with the help of a Phase Diagram.	16	K2	CO2
3. Discuss the concept of Austempering and Martempering.	16	K2	CO3
4. Give any two important properties of ceramics. Write short notes on any four ceramic materials.	16	K2	CO4
5. Illustrate the importance of Ionic polymer matrix composite.	16	K2	CO5
6. Discuss the various influences of Alloying elements on steel.	16	K2	CO2
7. Elaborate how the aerospace industry loves to use plastics to make an airplane, helicopter, and military jets.	16	K2	CO4
8. Describe the Substitutional and Interstitial solid solution with suitable examples.	16	K2	CO1