Total No. of Printed Pages: 2

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PAPER CODE	U213-2113(RE)

December 2023 (REEXAM)

SY B.TECH (SEMESTER - I)

COURSE NAME: Material Science and Engineering Metallurgy **Branch: MECHANICAL**

COURSE CODE: MEUA21203

(PATTERN 2020)

Time: [2 Hrs] **[Max. Marks: 60]**

(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any two sub questions each from each Question 1 ,2, 3,4,5 and 6 respectively**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Define unit cell and write about all parameters with the help of drawing	[5]	1	Knowledge
	b) List ionic crystal imperfections with proper Diagram.	[5]	1	Knowledge
	c) Name Basic 4 Classification of Crystal defects in detail.	[5]	1	Knowledge
Q2	a) Explain procedure to conduct dye penetrant test.	[5]	2	Understand
	b) Differentiate in brinell and Vickers hardness test	[5]	2	Understand
	c) Demonstrate charpy U notch and V notch specimen with proper diagram.	[5]	2	Understand
Q3.	a) How hume rothery rules are applied foe selection of solute and solvent	[5]	3	Apply
	b) With neat diagram illustrate the cooing curve of of eutectic alloy and apply gibes phase rule in solidus region.	[5]	3	Apply
	c) Show the importance of reflecting media with proper example with respect to Microscope	[5]	3	Apply
Q.4	a) Classify steel on the basis of carbon percentage.	[5]	4	Understand
	b) Explain importance of A_1 and A_3 temperature on iron carbon diagram	[5]	4	Understand
	c)Discuss microstructure of AISI 1040steel at room temperature and show the calculation at room temperature.	[5]	4	Understand
Q.5	a) Sketch TTT curve for eutectoid steel and show 100% bainite and 100% martensite cooling curve	[5]	5	Apply
			5	Apply

	b) Choose right alloying element in tool steel and explain its importance. c) Choose correct cast Iron for the application of road roller wheels and justify the statement.	[5] [5]	5	Apply
Q.6)	a) Discuss isothermal annealing process with the help of TTT diagram.	[5]	6	Understand
	b) Explain benefits of tempering and classify tempering process	[5]	6	Understand
	c) Explain why hypoeutectoid steels are hardened from A_1 temperature and advantages of hardening	[5]	6	Understand