

Total No. of Questions – [3]

Total No. of Printed Pages: [2]

G.R. No.	
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PAPER CODE	U212-263 (ESE-DSY)
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**July 2023 (ENDSEM) EXAM**

**S.Y.B.TECH. (DSY) (Mechanical) (AY 2022-23 SEMESTER - I)**

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

**COURSE CODE: MEUA21203**

**(PATTERN 2020)**

Time: [1Hr]

[Max. Marks: 30]

**(\*) Instructions to candidates:**

- 1) Use of scientific calculator is allowed
- 2) Use suitable data where ever required
- 3) All questions are compulsory

Question No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Classify the steel based on the amount of gas evolved from the reaction of carbon with iron oxide during solidification.	[4]	[4]	[2]
	b) Describe the microstructures of AISI 1040 and AISI 1060 at room temperature.	[6]	[4]	[2]
	OR			
	c) Describe the Iron-Iron Carbide phase diagram with all the phases and invariant isothermal phase reactions.	[6]	[4]	[2]
Q.2	a) Discuss the effect of addition of Nickel and Molybdenum in alloy steels.	[4]	[5]	[2]
	b) Explain the Time Temperature Transformation curve for C60 with importance of critical cooling rate.	[6]	[5]	[2]
	OR			
	c) Explain the following transformation on TTT curve with i) 40% Bainite and 60 % martensite ii) 100% Martensite iii) 50% Pearlite and 50% Bainite	[6]	[5]	[2]

<b>Q.3</b>	a) Explain the complete annealing process used for producing equilibrium microstructure.	<b>[4]</b>	<b>[6]</b>	<b>[2]</b>
	b) Interpret the suitable annealing process used to improve the machinability of high carbon and alloy steel.	<b>[6]</b>	<b>[6]</b>	<b>[3]</b>
	<b>OR</b>			
	c) Illustrate that the amount of retained austenite increases with increase of carbon content of the steel.	<b>[6]</b>	<b>[6]</b>	<b>[3]</b>

Note- [BT Level: 1- Remember, 2- Understand, 3- Apply, 4- Analyze, 5- Evaluate 6- Create]