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**BE - SEMESTER- III EXAMINATION - SUMMER 2020** 

Subject Code: 3131904 Date:28/10/2020

**Subject Name: Material Science and Metallurgy** 

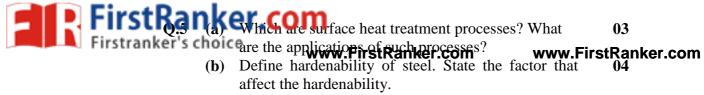
Time: 02:30 PM TO 05:00 PM Total Marks: 70

## **Instructions:**

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.

			Marks
Q.1	(a)	Draw miller indices of [111] and (110).	03
•	<b>(b)</b>	Define atomic packing factor (APF) and find APF	04
		for FCC material.	
	(c)	Do the detailed classification of Engineering Material.	07
Q.2	(a)	Grain boundary is a defect. Evaluate.	03
	<b>(b)</b>	Explain Lever rule with example.	04
	(c)	Explain homogeneous and heterogeneous nucleation process with neat sketch.	07
OR			
	<b>(c)</b>	Explain a Nucleation and growth in Solidification of metals.	07
Q.3	(a)	What is solid solution? Discuss in brief types of solid solution with neat sketch.	03
	<b>(b)</b>	Write the difference between impurities and alloying	04
	()	elements. Write importance of alloying.	
	(c)	Explain cooling curve of binary alloy forming solid	07
		solution.	
0.2	(-)	OR	0.2
<b>Q.3</b>	(a)	Explain Point defect & Line defect.	03 04
	<b>(b)</b>	Explain Hume Rothay rule for substitutional solid solution.	04
	<b>(c)</b>	Explain the detail procedure of polishing the	07
		specimen for micro-examination.	
<b>Q.4</b>	(a)	Differentiate between Austenite and Ferrite.	03
	<b>(b)</b>	What are the limitations and capabilities of LPT	04
	<b>(c)</b>	Draw and label Iron – Iron Carbide diagram. Also	07
		explain the reactions taking place in it.  OR	
<b>Q.4</b>	(a)	Differentiate between LPT and MPT.	03
	<b>(b)</b>	Explain the Ultrasonic Testing.	04
	<b>(c)</b>	List the common methods of powder production in	07
		powder metallurgy & discuss their influences on the	
		properties of final product.	
<b>Q.5</b>	(a)	Explain macro examination.	03
	<b>(b)</b>	Differentiate between annealing and normalizing.	04
	<b>(c)</b>	Draw TTT-diagram for a steel with 0.8% carbon and	07
		show austenite to martensite transformations on it.	

OR



Explain the mechanism of corrosion. Also explain **07** any one corrosion prevention technique in detail.

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