Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 172101 **Date: 25-11-2014**

Subject Name: Physical Metallurgy - II

Time: 10:30 am - 01:00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Describe the mechanism of formation of austenite on heating eutectoid steel.	**07**
	(b)	Define heat treatment. List different types of annealing processes. Differentiate between full annealing and partial annealing.	**07**
Q.2	**(a)**	Explain Hull-Mehl model of Pearlitic transformation.	**07**
	(b)	Draw Time - Temperature -Transformation (TTT) diagram for hypereutectoid steel and describe the effect of alloying elements on TTT diagram.	**07**
		OR	
	(b)	Explain why Martensite is hard? What is the crystal structure of Martensite? Discuss Bain Distortion Model.	**07**
Q.3	**(a)**	What is carburizing? Briefly discuss solid (pack) carburizing.	**07**
	(b)	Discuss heat treatment for En:8 steel.	**07**
		OR	
Q.3	**(a)**	How Austenitic grain size can be measure? Explain any one method.	**07**
	(b)	Describe the characteristics and mechanism of Bainitic transformation.	**07**
Q.4	**(a)**	Short note on Austempering.	**07**
	(b)	Explain heat treatment for tool steel	**07**
		OR	
Q.4	**(a)**	Short note on thermo mechanical treatment .	**07**
	(b)	What is Hardenability? What are different methods carried out to check this? Explain about Jominy end quench test.	**07**
Q.5	**(a)**	Define the following defects in heat-treated parts and explain their causes and possible remedies: 1. Decarburization 2. Overheating 3. Burning.	**07**
	(b)	What do you understand by Diffusionless martensitic transformation? Explain the effect of applied stress on martensitic transformation.	**07**
		OR	
Q.5	**(a)**	What is Quenching? List out different Quenchant. Discuss different Characteristics of Quenchants and explain mechanism of quenching.	**07**
	(b)	What is Heat treatment. Discuss briefly about Normalizing, Hardening and Tempering	**07**

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