Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: X 31902 Date: 28/12/2012

Subject Name: Material Science and Metallurgy

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)**	Classify engineering materials. Write any five Criteria for selection of materials for engineering applications.	**07**
	(b)	Explain the various types of spark pattern to identify material in spark test.	**07**
Q.2	**(a)**	Explain the difference between Ductile and Brittle structures.	**07**
	(b)	Explain thermal equilibrium diagrams of binary alloy partial soluble in solid state.	**07**
		OR	
	(b)	Explain phase and lever rule.	**07**
Q.3	**(a)**	Draw iron carbon diagram and explain cooling process and its structure change at all critical points of hypo-eutectoid steel.	**07**
	(b)	Explain the difference between mild steel and HSS.	**07**
		OR	
Q.3	**(a)**	Draw iron carbon diagram and explain cooling process and its structure change at all critical points of hyper-eutectoid steel.	**07**
	(b)	Explain structure, properties and application of malleable cast iron.	**07**
Q.4	**(a)**	Describe effect of quenching media on properties of steel during heat treatment.	**07**
	(b)	Explain TTT diagram.	**07**
		OR	
Q.4	**(a)**	Mention all alloy of copper and explain any two.	**07**
Q.4	**(b)**	Explain cathodic protection against corrosion.	**07**
Q.5	**(a)**	Explain working principle of LPT and its method and applications.	**07**
	(b)	What is Powder metallurgy? State advantages and limitations of powder metallurgy.	**07**
		OR	
Q.5	**(a)**	Explain working principle of MPT and its method and applications.	**07**
	(b)	What is Wrought iron? Enlist properties and application of it.	**07**

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