Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-III Examination-Dec-2011

Subject code: X31902 **Date: 15/12/2011**

Subject Name: Material science & Metallurgy

Time: 2.30 pm -5.00 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)**	Define Material science and Metallurgy. Give classification of Engineering materials.	**07**
	(b)	Define Corrosion. Explain difference of dry type and Wet type corrosion.	**07**
Q.2	**(a)**	Explain the following terms : (i) Toughness (ii) Stiffness (iii) Malleability (iv) Resistivity	**07**
	(b)	What do you mean by Nod destructive testing? Explain 'Dye penetration testing'.	**07**
		OR	
	(b)	State and derive an expression for Bragg's law used in x-rays diffraction.	**07**
Q.3	**(a)**	What is atomic packing factor? Calculate the same for BCC and FCC structures.	**07**
	(b)	Explain the following by giving their differences Pearlite, Ferrite and austenite.	**07**
		OR	
Q.3	**(a)**	Enlist the properties of Engineering materials. Explain any two thermal properties.	**07**
	(b)	What is Powder metallurgy? State advantages and limitations of powder metallurgy.	**07**
Q.4	**(a)**	Give difference between Ductile and Brittle structures.	**06**
	(b)	Explain the following in brief : (i) Grey cast Iron (ii) Wrought Iron	**08**
		OR	
Q.4	**(a)**	Explain Aluminium and its alloys	**06**
	(b)	Explain the concept of Heat treatment of steel. List various steel heat treatment methods. Explain any one briefly.	**08**
Q.5	**(a)**	Discuss Engineering requirements of materials.	**04**
	(b)	Write short note on "Corrosion control".	**03**
	(c)	Draw Iron-carbon phase diagram.	**07**
		OR	
Q.5	**(a)**	Discuss 'Magnetic particle testing.'	**04**
	(b)	Represent planes (1 0 1) and (0 0 1) in a cubic unit cell.	**03**
	(c)	Classify Copper alloys and discuss them in brief.	**07**

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