Sea	nt No.:	Enrolment No GUJARAT TECHNOLOGICAL UNIVERSITY		
		BE - SEMESTER-III(OLD) • EXAMINATION – WINTER 2016		
Subject Code:133403			Date:06/01/2017	
	•	Name: Engineering Materials and Metallurgy	•	
	-	0:30 AM to 01:00 PM Total Marks: 7	70	
	truction			
		Attempt all questions.		
		Make suitable assumptions wherever necessary. Figures to the right indicate full marks.		
Q.1	(a)	What do you understand by iron carbon equilibrium diagram? Explain iron carbon with neat sketch.	07	
	<b>(b)</b>	Explain the micro-constituents of iron and steel.	07	
Q.2	(a) (b)	Describe Gibb's phase rule and lever arm rule.  Explain about composite materials and Nano-materials.  OR	07 07	
	<b>(b)</b>	What do you mean by superconductor and explain type 1 and type 2 superconductors.	07	
Q.3	(a) (b)	Describe various types of magnesium alloys and its applications.  Draw and explains isothermal transformation diagram.  OR	07 07	
Q.3	(a)	What are the purposes of heat treatment processes? Explain its classification in brief.	07	
	<b>(b)</b>	Describe hardness testing with suitable diagram	07	
Q.4	(a)	Define polymer. Write any three polymer materials for commodity, engineering and specialty materials with corresponding applications.	07	
	<b>(b)</b>	Explain crystal imperfection and also discuss the strengthening mechanisms and modulus of elasticity with neat sketch.  OR	07	

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Explain the working phenomena of Charpy and Izod impact testing machine with

What is the difference between cast iron and steel? Explain nodular cast iron in

Classify phase diagram. Draw and explain the cooling curve for pure metal.

Explain principle, procedure and advantages of induction hardening.

Discuss about the effects of Mn, Mo and Si alloy addition on steel.

Write a short note about bio degradable plastics with examples.

**Q.4** 

**Q.5** 

**Q.5** 

(a)

**(b)** 

(a)

**(b)** 

(a)

**(b)** 

detail.

neat diagram.

**07** 

**07** 

**07** 

**07** 

**07** 

**07**