Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

•		ode: 710808N Date: 16-01-2013 Name: Material Science and Materials	
•	e: 02.	30 pm – 05.00 pm Total Marks: 70	
111511	1. 2. 1	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a) (b)	Define the term "property". Discuss in detail any two mechanical properties. (i) Explain the following terms: (a) Atomic number (b) Mass number (ii) Write a short note on Grain boundary deformation.	07 04 03
Q.2	(a)	(i) Cite the difference between Destructive and non destructive testing.	04
	(b)	(ii) Explain Anisotropy of material properties. Discuss in detail the requirement of engineering materials. OR	03 07
	(b)	Write a short note on "Smart materials".	07
Q.3	(a) (b)	Show that the atomic packing factor of FCC and HCP is equal. Explain in detail the effect of temperature on properties of materials. OR	07 07
Q.3	(a) (b)	Discuss in detail the electronic configuration. Explain the fracture behavior of engineering materials.	07 07
Q.4	(a)	Define the term "Thermal properties" and derive the relationship between specific heats.	07
	(b)	(i) What do you mean by grain boundary angles?(ii) Explain the term "creep".	04 03
		OR	٥.
Q.4	(a)	Write a short note on super alloys.	07
	(b)	(i) Discuss in detail the Wiedemann Franz ratio.(ii) What is the role of computer in metal processing?	04 03
Q.5	(a)	Discuss in detail the fatigue failure.	07
	(b)	Write a short note on delayed fracture.	07

(a) Discuss in detail the Co-valent bonding.

(b) Discuss in detail the Debye theory for specific heat.

Q.5

OR

07

07