 Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-II [All Branch] examination June 2009

Subject code: 110011 **Subject Name: Physics**

Date: 08/06/2009 **Time: 10:30am-1:00pm**

Instructions: **Total Marks: 70**

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

Q.1	(a)	List and explain the characteristics of musical sound.	**03**
	(b)	Explain factor affecting acoustics of the building.	**03**
	(c)	Properly explain the advantage of the fiber optics.	**03**
	(d)	How properties of semi conducting materials are differed From conducting materials?	**03**
	(e)	List the application of the LASER.	**02**
Q.2	(a)	Explain the arrangement of determine the velocity of ultrasonic Waves using required figures. Also explain the application of the ultrasonic.	**07**
	(b)	Explain & derived the relation between the inter planar distance and cube edge.	**07**
		OR	
	(b)	What is Einstein coefficient? Derived the relation between the Einstein coefficient. Also give the difference between stimulated Emission.	**07**
Q.3	(a)	A rectangular semiconductor specimen of thickness 1 mm place the magnetic field of flux density 0.5 Wb/m^2. Current of 1.5 mA is flowing through specimen in one direction. Calculate resulting hall voltage. Here Hall coefficient of the material is 1×10^{-2} M^3/C.	**05**
	(b)	Explain the classical free electron theory of metal.	**05**
	(c)	Give the comparison of classI and classII super conductors.	**04**
		OR	
Q.3	(a)	Calculate the energy gap in Ge when it is transparent to radiation of wavelength of 12000A [h=6.625× 10^{-34} J C=3×10^8 m/s].	**05**
	(b)	Give the application of the super conductor.	**04**
	(c)	Give the understanding of Thermal conductivity.	**05**
Q.4	(a)	Calculate the electrical conductivity of copper. Given atomic weight, density and relaxation time as 63.5, 8.9×10^3 Kgm^{-3} and 2.48×10^{-14} S respectively.	**05**
	(b)	Give the difference between simple, zener, and varactor diode.	**05**
	(c)	Explain the hall effect.	**04**
		OR	
Q.4	(a)	Calculate the change in wavelength of x-ray photon when it is scattered through an angle of 90^0 by a free electron.	**05**
	(b)	Give the classification of solids into metals, semiconductor,insulator on the basis of energy band theory.	**05**
	(c)	Explain pulse echo system.	**04**
Q.5	(a)	List the various methods of Non Destructive testing and explainTwo of Them in details.	**06**
	(b)	What is biomaterial? List them.	**04**
	(c)	What is dielectric loss? explain in details.	**04**
		OR	
Q.5	(a)	What is super conducting material? List the properties of super conducting materials and explain each in detail.	**07**
	(b)	What is nano technology ? List the application of Nano technology.	**04**
	(c)	Explain the principal of pseudo elasticity.	**03**

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