Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEMESTER 1st / 2nd (OLD) EXAMINATION WINTER 2016

Subject Code: 110011 Date:21/01/2017

Subject Name: ENGINEERING PHYSICS

Time:10:30 AM TO 1:00 PM Total Marks: 70

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

Q.1 **(a)** Answer the following questing. (one mark each) **07**

1. Define Standard Intensity.
2. What is SONAR?
3. What is the full form of LASER?
4. Define Unit cell.
5. Give the statement of Hall Effect.
6. Define Critical Angle in optical fiber.
7. What is reverberation?

(b) Answer the following questing. (one mark each) **07**

1. Give the full form of SQUID.
2. What are shape memory alloys?
3. Define photovoltaic effect.
4. State the Weber-Fechner law.
5. What is Kevlar?
6. Define Acceptance Angle in optical fiber.
7. What is the active center in Nd-YAG Laser?

Q.2 **(a)** Discuss the Nd-YAG laser with suitable diagrams and its applications. **07**

(b) Give differences between Type -I and Type-II Superconductors. **04**

(c) Explain construction of an Optical Fiber. **03**

Q.3 **(a)** Discuss various factors affecting the acoustics of buildings and their remedies. **07**

(b) Give the differences between Single Mode fiber and Multi Mode fiber. **04**

(c) Calculate the critical angle, acceptance angle and NA for a fiber having refractive index of core and clad 1.54 and 1.49 respectively. **03**

Q.4 **(a)** Explain in detail Piezoelectric Method to produce the ultrasonic wave with its merits and demerits. **07**

(b) Discuss applications and properties of metallic glass. **04**

(c) What is the sound level of an aero plane having sound intensity 1000 watt/m^2? The standard intensity is 10^{-12} watt/m^2. **03**

Q.5 **(a)** What are the properties of nanomaterials? Explain any one method to prepare nanomaterials. **07**

(b) What are the success and drawbacks of classical free electron theory? **04**

(c) Write a short note on SONAR. **03**

Q.6 **(a)** Establish the relations between Einstein's coefficients A and B. **07**

(b) Write a note on Liquid penetration method of NDT. **04**

(c) What are population inversion, optical pumping and active medium for laser? **03**

Q.7	**(a)**	What is Hall effect? Derive equations for Hall voltage, hall coefficient and mobility of n –type semiconducting material.	**07**
	(b)	Derive the relation between the interplanar distance and cube edge.	**04**
	(c)	The critical temperature of mercury with isotopic mass 202 is 4.2K with α value 0.5. Calculate its critical temperature when its isotopic mass is 200.	**03**

****