Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– 1st / 2nd • EXAMINATION – SUMMER 2018

Subject Code: 110011 **Date: 18-05-2018**

Subject Name: Engineering Physics

Time: 02:30 pm to 05:00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Write and explain the factors affecting Acoustic of a building and their remedies.	**07**
	(b)	Describe the principle and the method of producing of ultrasonic waves by magnetostriction method.	**07**
Q.2	**(a)**	Discuss the steps to find Miller indices of a given plane with the help of example.	**07**
	(b)	Explain the term Hall-effect, Derive relation between Hall voltage and Hall-coefficient, State application of it.	**07**
Q.3	**(a)**	Write note on: Nd:YAG laser	**07**
	(b)	What is holography? Discuss the method of construction of hologram.	**07**
Q.4	**(a)**	Describe the construction of fiber optic cable and compare the advantage of fiber optic cable over metallic cable.	**07**
	(b)	Deduce expression for electrical conductivity of conducting material and hence obtain Wiedemann Franz law.	**07**
Q.5	**(a)**	What is superconducting material? List the properties of superconducting materials and explain in detail.	**07**
	(b)	Write note on: CO_2 laser.	**07**
Q.6	**(a)**	What are Nanomaterials? What are the four applications of Nanomaterials?	**07**
	(b)	Explain the method of x-ray radiography to detect the exact location of the flaws.	**07**
Q.7	**(a)**	A silica optical fiber has a core of refractive index 1.58 and a cladding of refractive index 1.46. Determine (*i*) the critical angle at the core-cladding Interface (*ii*) the numerical aperture for the fiber and (*iii*) the acceptance angle in the air for the fiber.	**03**
	(b)	The intensity levels of two sound waves of the same frequency in a medium are 20 dB and 60 dB. What is the ratio of their amplitude?	**03**
	(c)	The volume of a room is 2500 m^3. The wall area of the room is 330 m^2, the floor area is 165 m^2, and the ceiling area is 165 m^2. The average sound absorption coefficient (*i*) for wall is 0.025; (*ii*) for the ceiling is 0.75; and (*iii*) the floor is 0.05. Calculate the average sound absorption coefficient and reverberation time.	**04**
	(d)	An ultrasonic source of 0.05 MHz sends down a pulse towards the seabed which returns after 0.55 s. The velocity of sound in water is 1500 m/s. Calculate depth of the sea and wavelength of the pulse.	**04**

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