

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: CO₂ 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 m³. The wall area of the room is 330 m², the floor area is 165 m², and the ceiling area is 165 m². 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**
