Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE –SEMESTER 1&2(NEW SYLLABUS)EXAMINATION- WINTER 2018

Subject Code: 3110011   **Date: 04-01-2019**
Subject Name: Physics
Time: 10:30 am to 01:00 pm   **Total Marks: 70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

                                                            Marks

Q.1 **(a)** Define: Ductility and Plasticity.   **03**
    (b) Draw: Stress – Strain diagram with necessary notation. Explain: Elastic Limit   **04**
        and Upper Yield Point in detail.
    (c) Explain Types of Elasticity In detail. Explain Factor affecting on Elasticity.   **07**

Q.2 **(a)** Define :Damped Harmonic Motion   **03**
    (b) Explain Sound Absorption and Reverberation   **04**
    (c) Illustrate various aspect associated with Acoustic of building.   **07**
                                            OR
    (c) Derive the Expression for Depression of Cantilever.   **07**
Q.3 **(a)** Write down various advantage and disadvantage of NDT.   **03**
    (b) Calculate the frequency to which a piezo electrical oscillator circuit should be **04**
        tuned so that a piezo electrical crystal of 0.1cm thickness vibrates in its
        fundamental mode to generate ultrasonic waves. (Young`s modulus
        and density of the materials of crystal are 80GPa and 2654 Kg/m^3)

    (c) Write a short note on Piezoelectric method for production of ultrasonic sound.   **07**
                                            OR
Q.3 **(a)** Explain Hook`s Law   **03**
    (b) Calculate the fundamental frequency of vibration when   **04**
        A quartz crystal of 0.15cm thickness is vibrating at resonance. (Young's
        Modulus of quartz is 7.9×10^{10} N/m^2 and density is 2650 Kg/m^3

    (c) Explain: Non Destructive Testing.   **07**
Q.4 **(a)** Define: Penetration depth in the vicinity of Superconductivity.   **03**
    (b) The Critical temperature of superconductor is 9.15K. At zero Kelvin the critical **04**
        field is 0.196 Tesla. Calculate the field at 6K.
    (c) Explain Josephson`s Junction and its applications.   **07**
                                            OR
Q.4 **(a)** Define Ultrasonic waves with necessary properties.   **03**
    (b) Explain various applications of superconductor.   **04**
    (c) Write short note Ruby Laser with necessary diagram.   **07**

Q.5 **(a)** Define: Population Inversion   **03**

	(b)	Differentiate normal light and Laser light.	**04**
	(c)	Explain various applications of LASER in Engineering and Medicine	**07**

OR

Q.5	**(a)**	Define : Simulated Emission	**03**
	(b)	Explain Kundt`s tubes method for the detection of Ultrasonic Sound.	**04**
	(c)	The volume of room is $800m^3$. The wall area of the room is $240m^2$, the floor area is $120m^2$ and the ceiling area is $120m^2$. The average sound absorption coefficient, (a) for the walls is 0.03 (b) for the ceiling is 0.8 (c) the floor it is 0.06 .Calculate the average sound absorption coefficient and the reverberation time.	**07**