Center Code:033

Enrolment No._____ Student sign:-_____

GUJARAT TECHNOLOGICAL UNIVERSITY

Mahatma Gandhi Institute of Tech. Education & Research Center, Navsari

B. E. F. Y. (SEM – II) MID SEMESTER EXAMINATION - MARCH 2009

Subject: Engineering Physics (Code: 110011)

Date: 27/03/2009 Time: 90 Minutes Max. Marks: 40

Q.1 Answer the following questions. [12]

(1) Give the factors effecting acoustics of buildings.

(2) Write down the properties of ultrasonic sound.

(3) What is primitive cell?

(4) Define Fermi level in conductors.

(5) Give the principle of solar cell.

(6) Write down the types of diode.

(7) What are the applications of LED?

(8) Explain in short: Stimulated emission.

(9) What is pumping? Give the types of pumping.

(10) Write down the properties of laser light.

(11) Define metastable states.

(12) Give full name of Nd-YAG laser.

Q.2 (A) Answer the following questions. [10]

(1) Define reverberation, reverberation time, Absorption co-efficient and explain the method to find the absorption co-efficient for given material.

(2) Explain how to find Miller indices for given plane with appropriate example and derive the inter planner distance formula.

[B] Solve the following numerical. [4]

An ultrasonic beam of 2 cm wavelength sent by ship returns from sea bed after 2 second, If velocity of ultrasonic beam in sea water is 1510 m/s at 0°. Its salinity at 30°c is 2 gm/liter find the frequency of ultrasonic sound and depth of the sea.

OR

Q.2 **(A)Answer the following questions.** **[10]**

(1) Explain magnetostriction method to produce ultrasonic sound.

(2) Explain how the bands are formed in solids. Classify solids according to band theory of solids.

[b] Solve the following numerical. **[4]**

What is the resultant sound level when 70dB sound is added to 80 dB sound**?**

Q.3 **(A) Answer the following questions.** **[10]**

(1) Explain Hall Effect and derive the expression for Hall co-efficient $\mathbf{R_H}$. Also explain how to determine mobility (μ) and charge concentration (n) using this effect.

(2) Explain construction and working of CO_2 laser.

(B) Solve the following numerical. **[4]**

Obtain the probability for not occupying the energy level E at temperature 200 K. Where $\mathbf{E-E_F}$ =0.01 eV.

OR **[10]**

Q.3 **(A) Answer the following questions.**

(1) Explain all crystal systems and Bravais lattice with necessary diagrams.

(2) Obtain the relation between Einstein's co-efficient A and B. Also state the conditions for dominance of stimulated emission over other processes. **[4]**

(B) Solve the following numerical.

Find the ratio of population of the two energy states in a laser the transition between which is responsible for the emission of photons of wavelength 698.3 nm at temperature 300 k.