SANKALCHAND PATEL COLLEGE OF ENGINEERING, VISNAGAR
MID-TERM EXAMINATION, MARCH-2009
B.E. SECOUND SEMESTER (EE, ME, IT)

Subject : PHYSICS Time: 90 minute

Date : 27/03/2009 Total Marks: 40

Instructions:

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

Q-1: Answer the following question in short.

(1) Which optical device are use as transmitter & receiver in optical fiber? **(1)**
(2) State the basic principal of optical fiber communication. **(1)**
(3) What is critical magnetic field for super conductor? **(1)**
(4) Give two effects to produce ultrasonic sound. **(1)**
(5) Define unit cell. **(1)**
(6) Define reverberation time. **(1)**
(7) What is magnetostriction effect? **(1)**
(8) Define superconductivity. **(1)**

Q-2: calculate any four examples out of six.

(1) Calculate the inter planner spacing for a (3, 1, 1) plane in a simple Cubic lattice whose lattice constant is 2.109×10^{-10} m. **(3)**

(2) A Hall measuring 25.2m × 20.3m ×8.04m has a reverberation time of 0.75 sec when empty. What will be reverberation time? When an audience of 500 is present? [Take one person as Equivalent to 0.3176 m^2 absorption in Sabine's] **(3)**

(3) Calculate the critical current for superconducting wire of lead having Diameter 1 mm at 4.2 K .critical temperature for lead is 7.18 K & $H_c(0) = 6.5\times10^4$ A/meter. **(3)**

(P.T.O.)

Create PDF files without this message by purchasing novaPDF printer (http://www.novapdf.com)

(4) Calculate the frequency to which piezoelectric oscillator circuit Should be tuned so that a piezoelectric crystal of thickness 0.2cm Vibrates in its fundamental mode to generate ultrasonic waves. (Young's modulus and the density of material of crystal are 80×10^9 Pascal and 2700 kgm^{-3}). **(3)**

(5) If a 1 cm radius copper cable passes the 10 ampere at 5.2 v/m then Calculate the relaxation time of electron in cable, $n=8.48\times10^{28}/(m)^3$. **(3)**

(6) An optical fiber core & cladding have a refractive index 1.45 & 1.40, calculate the critical angel, acceptance angle & numerical Aperture. **(3)**

Q-3: Answer following question in detail (any two).

(1) Calculate the rate of absorption of sound energy inside a hall in Term of energy density **(6)**

(2) What is piezoelectric effect? Explain neat circuit diagram the Generation of ultrasonic wave by using piezoelectric oscillator. **(6)**

(3) What are Miller indices? Explain with proper example how to Determine miller indices & mention its future. **(6)**

Q-4: Answer following question in detail (any two).

(1) Give the difference between type-1& type-2. **(4)**

(2) Obtain expression for thermal conductivity &. State & deduce Wiedemann Franz law. **(4)**

(3) Give definition of acceptance angel & numerical aperture .Derive Their equation. **(4)**

Best of luck

Create PDF files without this message by purchasing novaPDF printer (http://www.novapdf.com)