(28)   **SARDAR PATEL UNIVERSITY**
M. Sc. Integrated Biotechnology Examination, Second Semester
Tuesday, 21st April 2015
10:30 a.m. to 1:30 p.m.
PS02CIGB01: Physics- II

Maximum Marks: 70

Note: 1) All the Questions are compulsory.
     2) Figures on the right indicate marks.

Q.1 Choose the correct option.   [8]
1 The unit of force is _____.
      (a) Newton (b) Webber (c) Tesla (d) Coulomb
2 _____ is an example of a ferromagnetic substance.
      (a) nickel (b) alcohol (c) hydrogen (d) chromium
3 The ratio of lateral strain to linear strain is known as_____.
      (a) Modulus of elasticity   (b) Young's modulus
      (c) Poisson's ratio   (d) Bulk modulus
4 The threshold intensity for sound wave of frequency is _____.
      (a) 10^{-8} watt/ m^2 (b) 10^{-10} watt/ m^2 (c) 10^{-12} watt/ m^2 (d) None of these
5 Heat flowing from one side to other side does not depend directly on _____.
      (a) face area (b) thickness (c) temperature difference (d) time
6 The process of transmission of heat from one body to another body without
   heating the intervening medium is called _____.
      (a) conduction (b) convection   (c) radiation (d) None of these
7 The number of atoms per unit cell in FCC crystal structure is _____.
      (a) 2   (b) 4   (c) 1   (d) 6
8 In N-type semiconductor materials, the majority charge carriers are _____.
      (a) electrons   (b) holes (c) protons (d) neutrons

Q.2. Answer the following questions. (Attempt any seven)   [14]

1 State the properties of electric line of force.
2 Enlist the properties of diamagnetic substance.
3 Plot a graph of stress versus strain.
4 Explain Newton's formula for calculation of velocity of sound in air.
5 State the properties of sound absorbing materials.
6 Define specific heat capacity and give its formula.
7 State and explain first law of thermodynamics.
8 Define lattice and basis of a crystal.
9 Draw the plane for given Miller Indices (100) and (111).

(P T O)

Q.3(a) Derive the equation of electrostatic potential at a given point. Give its various Units. **[06]**

(b) Define Paramagnetic and ferromagnetic substance. Also state their properties. **[06]**

OR

(b) (i)Two equal and similar charges 3 cm apart in air repel each other with a force equivalent to that of 1.5kg wt. Find the charges in Coulomb. **[03]**

(ii) Define Hall effect. State its applications **[03]**

Q.4 (a) Explain Young Modulus and Bulk modulus. **[06]**

(b) Discuss the effect of temperature and pressure on the speed of sound. At what temperature will the speed of sound in air become double of its value at 0^0C? **[06]**

OR

(b) Derive general expression for the velocity of sound in Gaseous medium. **[06]**

Q.5(a) Derive an expression for rectilinear flow of heat along a bar. **[06]**

(b) Define co-efficient of thermal conductivity. Explain the Searle's method for determination of thermal conductivity of good conductors. **[06]**

OR

(b) (i)A very small hole in an electric furnace is used for treating metals acts nearly as a black body. If the hole has an area 200mm^2 and it is desired to maintain the metal at 1100°C, how much energy travels per second through the hole? $\sigma=5.67 \times 10^{-8}$ Wm^{-2}K. **[03]**

(ii)State and explain Stefan's Law. **[03]**

Q.6 (a) Write a note on Light Emitting Diode and Photovoltaic cell. **[06]**

(b) (i)Calculate the atomic packing factor for BCC crystal structure. **[03]**

(ii)Write a note on Intrinsic and Extrinsic semiconductors. **[03]**

OR

(b) What is crystal symmetry? Explain point group symmetry and space group symmetry with appropriate examples. **[06]**

*****All the best*****