BSC. PART - II EXAMINATION - 2016

PHYSICS SUB/ GEN

GROUP - A (Compulsory)

1. Answer all questions selecting the correct option from the following :

(a) Which is not a magnetic property ?
(i) Permeability (ii) Susceptibility (iii) Resistivity (iv) Coercivity

(b) Q-factor of a coil is :
(i) $Q = wLR$ (ii) $Q = \frac{wL}{R}$ (iii) $Q = \frac{R}{wL}$ (iv) $Q = \frac{1}{wLR}$

(c) The ground state energy of a hydrogen atom is :
(i) 13.6 eV (ii) –13.6 eV (iii) 3.4 eV (iv) –3.4 eV

(d) When two plane-polarised waves combine to produce a circularly polarised wave. then they differ in phase by :
(i) Zero (ii) $\frac{\pi}{2}$ (iii) π (iv) 2π

(e) The Curie-Weiss's law for ferromagnetic materials is :
(i) $\chi \propto \frac{1}{T}$ (ii) $\chi \propto \frac{1}{T - T_c}$ (iii) $\chi \propto \frac{1}{T + T_c}$ (iv) $\chi \propto \frac{1}{T_c}$

(f) The phenomenon which confirms that light waves are transverse in nature is:
(i) Interference (ii) Diffraction (iii) Polarisation (iv) Dispersion

(g) In Newtons ring the diameter of n^{th} dark ring is proportional to :
(i) n (ii) n^2 (iii) $n^{\frac{1}{2}}$ (iv) $n^{\frac{1}{2}}$

(h) The Bragg's law is :
(i) $2\lambda d = n \operatorname{cosec} 0$ (ii) $2\lambda d = n \sin 0$ (iii) $\frac{2d}{\lambda} = n \operatorname{cosec} \theta$ (iv) $\frac{2d}{\lambda} = n \sin \theta$

(i) If an electron can be stopped by a potential of 5 volts, its kinetic energy is :
(i) 5 volts (ii) 5 joules (iii) 5 calorie (iv) 5 eV

(j) Neutral temperature of a thermo-couple is the temperature at which the thermo e.m.f is :
(i) Zero (ii) Maximum (iii) Minimum (iv) Changes sing

GROUP - B

2. Give Langevin's theory of diamagnetism.

3. An alternating e.m.f $e = e_0 \sin wt$ is applied to a circuit containing inductance L, capacitance C and resistance R in series. Obtain the expression for instantaneous current in the circuit.
4. Describe Compton Effect. Obtain the expression for Compton shift.
5. What is radioactivity ? State the laws of radioactive disintegration. Define half-life and obtain its expression.

GROUP - C

6. State and explain Fermats principle of least time. Using the law, establish the laws of refraction at plane surface.
7. Describe Michelson's Interferometer. How it is used to measure wavelength of monochromatic light ?
8. Describe the diffraction of light due to a single slit.
9. Write short notes on any two of the following :
(a) Ruby Laser (b) Resolving power of a telescope (c) Production and detection of plane polarised light (d) Amplitude modulation