BSC. PART - II EXAMINATION - 2017

PHYSICS HONOURS PAPER IV

Answer five questions, selecting two questions each from Group A and Group B Q. No. 1 is compulsory.

1. Select the correct answer of the following :

(a) A ballistic galvanometer measures :

(i) Charge (ii) D.C. (iii) A. C. (iv) None of these

(b) The time constant of a circuit is the time in which the current decays by :

(i) 25% (ii) 37% (iii) 50% (iv) 63%

(c) Bohr magnetor is the unit of :

(i) Angular momentum (ii) Magnetic dipole

(iii) Both (i) and (ii) (iv) None of these

(d) The work function of a photometal is 3.3 eV. The threshold frequency will be:

(i) 8×10^{14} Hz (ii) 8×10^{56} Hz (iii) 8×10^{10} Hz (iv) None of these

(e) Plank's constant has unit of :

(i) Work (ii) Angular momentum (iii) Energy (iv) Linear momentum

(f) Bohr's model of an atom explains :

(i) Spectra of H-atom (ii) Stark effect (iii) Zeeman effect (iv) None of these

(g) The splitting of spectral lines under the effect of a magnetic field is called :

(i) Zeeman effect (ii) Bohr's effect (iii) Heisenberg's effect (iv) None of them

(h) The selection rule applied in pure rotational specturm is :

(i) $\nabla J = 0, \pm 1, \pm 2$ (ii) $\nabla J = 0, \pm 2$ (iii) $\nabla S = 0, \pm 1$ (iv) $\nabla L = 0, \pm 1$

(i) The phenomenon of evolution or absorption of energy at the junction of a thermocouple due to passage of an electric current is called :

(i) Joule's effect (ii) Seeback effect (iii) Peltier's effect (iv) Thomoson's effect

(j) The velocity of plane electromagnetic wave in vacuum is given by :

(i) $C = \sqrt{\frac{\mu_0}{\epsilon_0}}$ (ii) $C = \sqrt{\mu_0 \epsilon_0}$ (iii) $C = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$ (iv) None of these

GROUP - A

2. Establish the Einstein's equation of photoelectric emission. What are the laws of photoelectric emission ?

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3. What is Zeeman effect ? Give the mathematical theory of normal Zeaman effect.
4. What is an A.C bridge ? Describe with necessary theory, the measurement of inductance by Anderson's Bridge.
5. Define Seebeck, Peltier and Thomson effect. Show that

   (i) $\pi = T.\frac{dE}{dT}$ (ii) $\sigma_a - \sigma_b = T.\frac{d^2E}{dT^2}$ using thermodynamic.

GROUP - B

6. Discuss the theory of rotation vibration spectra of diatomic molecule.
7. Discuss the motion of a charged particle in crossed electric and magnetic field. What is velocity selector ?
8. Write Maxwell's field equation in a conducting medium. Obtain the wave solution for $\vec{E}$ and $\vec{B}$. Discuss the depth of penetration.
9. Write notes on any two of the following :
   (a) Scalar and vector potential (b) Poynting vector (c) Raman effect
   (d) Sharing of electrons