KT-XII-1701 ٢-٢/٩

Physics (Part – II) Roll No..............................

Sig. of Supdt.....................

Fresh/Reappear

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Time allowed: 3 Hrs **Physics (Part – II)** **Marks: 85**

Fresh / Reappear

Note: There are three sections of the paper. A, B & C. Attempt Section – A on the same paper and return it to the Superintendent within the given time. No marks will be awarded for cutting, erasing or over writing. Mobile phone etc. are not allowed in the examination hall.

Time: 20 Mins **Section "A"** **Marks: 18**

Q.1 Write the correct option i.e. A, B, C or D in the empty box provided opposite each part.

i. Coulomb per volt is equal to .... **[D]**
   A. Ampere   B. Newton   C. Energy   D Farad

ii. The energy stored in electric field is equal to .... **[A]**
   A. $\dfrac{Q^2}{2C}$ B. $\dfrac{Q^2}{2V}$ C. $\dfrac{2C}{Q^2}$ D. $C^2V^2/2$

iii. When the temp of a ohmic conductor is raised its resistance **[B]**
   A. Decreases   B. Increases   C. Constant   D. Plays no role

iv. Volt-ampere is unit of .... **[C]**
   A. Resistant   B. Energy   C. Power   D. Time

v. When a conductor is placed parallel to the magnetic field. The magnitude of the magnetic force will be **[B]**
   A. ILBsinθ   B. Zero   C. ILB   D. I/LB

vi. In order to minimize power losses due to eddy current in transformer, the core is laminated with **[C]**
   A. Conductor   B. Semi-conductor   C. Insulation   D. Super conductor

vii. The peak values of a sine wave occurs ....cycle. **[B]**
   A. Single   B. Twice   C. Zero   D. Both A & C

viii. The wave length of the visible region ranges from about .... **[C]**
   A. 700 nm to 900nam   B. 500nm to 900nm   C. 400nm to 700nm   D. 500 nm to 700nm

ix. Which of the following is not a ferromagnetic substance? **[C]**
   A. Cobalt   B. Nickal   C. Antimony   D. Iron

x. The device which converts A.C into D.C is called .... **[A]**
   A. Diode   B. Transformer   C. N-type substance   D. Amplifier

xi. A traveler on a train with speed of 0.8c, picks up and open a news paper the event takes 1.0sec as measured by the train traveler. As observed by a person stranding by the side of track, the event takes **[D]**
   A. 1.6sec   B. 1.9sec   C. 1.8sec   D. 1.7sec

xii. Balmer series occurs for transition ending at .... **[B]**
   A. n = 1   B. n = 2   C. n = 3   D. n = 4

xiii. The process in which no change in mass number occurs is called .... **[C]**
   A. α-emission   B. Proton emission   C. β-emission   D Neutron emission

xiv. Which one of he following is true relation for capacitor? **[A]**
   A. $\epsilon_r = C_{med}/C_{vc}$ B. $\epsilon_r = C_{vac}/C_{med}$ C. $\epsilon_r = C_{vac} \times C_{med}$ D. $\epsilon_r = C_{med} - C_{vac}$

xv. When a charge particle move parallel in to the magnetic field then the force on it will be ...... **[C]**
   A. Minimum   B. Maximum   C. ~~Variable~~ ZERO   D. Constant

xvi. In Fleming's right hand rule the fore finger represents .... **[A]**
   A. Direction of magnetic field   B. Direction of motion of conductor   C. Direction of induced current   D. Direction of force

xvii. The maximum K.E of photo electron is related to .... **[C]**
   A. Speed   B. Velocity   C. Stopping potential   D. Mass of photo electron

xviii. When an electron in an atom jumps from a higher to lower orbit its............. **[B]**
   A. K.E decreases, P.E increases   B. K.E increases, P.E decreases
   C. K.E increases, P.E increases   D. K.E decreases, P.E decreases

Physics (Part – II)

; Fresh/Reappear

Section "B"   Marks: 40

Q.2 Attempt any TEN parts. Each parts carries equal marks.

i. What is the difference between electric potential energy and electric potential at a distance "r" from charge Q? Write the mathematical form.

ii. Explain the statement "under constant physical conditions, the resistance "V/I" is a constant, independent for V or I and their direction".

iii. How the direction of induced current is determined?

iv. Why the galvanometer attached with a coil does not show deflection even that a magnet has placed stationary near the coil and the flux linking over the coil?

v. Why the back e.m.f must be smaller than the applied potential difference? Explain.

vi. What is the stress-strain curve and define the plastic deformation?

vii. What is the difference between forward bias and reverse bias of diode?

viii. What is the application of photoelectric effect in the function of solar cell? Explain with example.

ix. If a body contain "n_1" electrons and "n_2" protons then what is the total net charge on the body?

x. The energy of electron in quantized orbit is given by $E_n = -E_o/n^2$, what is the meaning of "–ve" sign here and calculate energy for lowest stationary energy state.

xi. Describe the relation what the given equation shows? $r = \sqrt{\dfrac{2Vm}{B^2 q}}$ where "V" B, and "q" stands for voltage, magnetic field and charge respectively 'm' is the mass of ions.

xii. If speed of light is constant, then why it decreases while passing through glass?

xiii. The resistance of wire is 5Ω. If its length is doubled, what will be its new resistance?

Section "C"   Marks: 27

Note: Answer any THREE questions. Each question carries equal marks.

Q.3.a. What is induced emf? State and explain Lenz's law, and show that Lenz's law is consistent with the law of conservation of energy.

b. At what rate the flux will change if a current of 1.2mA flows through the conductor of single loop connected with a 10Ω resistor (across its ends).

Q.4.a. State and explain Gauss's law and prove that $\phi_E = Q/\epsilon_0$ for a closed surface.

b. What is the electric potential energy of a 7nC charge that is 2cm from a 20nC charge?

Q.5.a. Derive relation for power loss in a resistor and inductor when A.C is passing through it?

b. An A.C circuit consists of a pure resistance of 200Ω is connected across A.C supply of 220V, 50Hz. Calculate (a) current (b) power consumed in the resistor.

Q.6.a. Prove that radii of stationary orbits of electron in hydrogen atom are quantized ($r_n = n^2 r_1$).

b. Draw the labeled diagram for energy levels for emission spectrum of hydrogen between n=1,2,3 ....∞ and E_n.