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Physics	Inter Part-II, 2025 Lahore Board	Group – II
Time: 20 Min.	Objective Type	Marks : 17

Note:

Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer book. Cutting or filling two or more circles will result in zero mark in that question.

1.1 The rest mass of photon is:
Ⓐ Zero Ⓑ m_0
Ⓒ Infinite Ⓓ 9.1×10^{-31} kg

2 Peak to peak value of A.C. is equal to:
Ⓐ V_0 Ⓑ $2V_0$
Ⓒ $\frac{V_0}{2}$ Ⓓ V_0^2

3 Voltmeter is a device like:
Ⓐ High resistance galvanometer
Ⓑ Low resistance galvanometer
Ⓒ Ammeter Ⓓ Zero resistance galvanometer

4 The width of depletion region of pn junction depends upon which factor:
Ⓐ Biasing conditions Ⓑ Doping density
Ⓒ Both A and B Ⓓ None of these

5 Which of the following does not vary by varying the frequency of A.C.:
Ⓐ Resistance Ⓑ Capacitive reactance
Ⓒ Inductive reactance Ⓓ All of these

6 Electric field and electric potential are related by the relation:
Ⓐ $E = \Delta Vr$ Ⓑ $E = -\frac{\Delta V}{\Delta r}$
Ⓒ $E = K\frac{q}{r^2}$ Ⓓ $E = -\frac{\Delta r}{\Delta V}$

7 Which of the following has greater ionizing power:
Ⓐ α-rays Ⓑ β-rays
Ⓒ γ-rays Ⓓ Neutrons

8 Mutual induction has practical role in the working of:
Ⓐ Galvanometer Ⓑ Ammeter
Ⓒ A.C. generator Ⓓ Transformer

9 When a platinum wire is heated it becomes white at about:
Ⓐ 500°C Ⓑ 1600°C
Ⓒ 2000°C Ⓓ 2500°C

10 Three capacitors each of capacitance $2\mu F$ are connected in parallel, their equivalent capacitance will be:
Ⓐ $2\ \mu F$ Ⓑ $4\ \mu F$
Ⓒ $6\ \mu F$ Ⓓ $8\ \mu F$

11 Above curie temperature, iron becomes:
Ⓐ Ferromagnetic Ⓑ Diamagnetic
Ⓒ Insulator Ⓓ Paramagnetic

12 The SI unit for electric power is:
Ⓐ Horse power Ⓑ Watt
Ⓒ K Wh Ⓓ JS

13 X-rays can be deflected by:
Ⓐ Electric field Ⓑ Magnetic field
Ⓒ Both Electric and magnetic
Ⓓ Cannot be deflected by fields

14 A diode characteristic curve is a graph between:
Ⓐ Current and time Ⓑ Voltage and time
Ⓒ Voltage and current Ⓓ Current and resistance

15 After two half life, the fraction of the radioactive sample remain undecayed is:
Ⓐ N_0 Ⓑ $\frac{N_0}{2}$
Ⓒ $\frac{N_0}{4}$ Ⓓ $\frac{N_0}{6}$

16 Which of the following converts electrical energy into mechanical energy:
Ⓐ A.C. generator Ⓑ Heat engine
Ⓒ Transformer Ⓓ Motor

17 The range of ammeter can be increased, if the value of shunt resistance is:
Ⓐ Decreased Ⓑ Increased
Ⓒ Doubled Ⓓ Remains Constant

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Physics	Inter Part-II, 2025 Lahore Board	Group – II
Time: 2.40 hrs.	Essay Type	Marks : 68

SECTION – I

Q.2 **Write short answers to any EIGHT (8) questions: 16**

i. If a point charge q of mass m is released in a non-uniform electric field with field lines pointing in the same direction will it make a rectilinear motion?

ii. How can you identify that which plate of a capacitor is positively charged?

iii. Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate? Explain.

iv. Suppose that a charge q is moving in a uniform magnetic field with velocity 'v'. Why is there no work done by magnetic force on the charge q?

v. How can radioactivity help in the treatment of cancer?

vi. A particle which produce more ionization is less penetrating. Why?

vii. What is the working of inkjet printer?

viii. How mathematically we calculate electric intensity inside hollow charged sphere?

ix. Explain the extension of right hand rule.

x. What is pivoted type galvanometer? Give its working.

xi. Compare α, β, γ radiation on the basis of:
(a) Range in air. (b) Speed.

xii. What is nuclear fission? Give example.

Q.3 **Write short answers to any EIGHT (8) questions: 16**

i. Do bends in a wire affect its electrical resistance? Explain.

ii. What is meant by Wheatstone bridge? How can it be used to determine an unknown resistance?

iii. Define tolerance. Give one example.

iv. What is meant by para and diamagnetic substance? Give one example of each.

v. Differentiate between ductile and brittle substances.

vi. Write down the resistivities of conductors, insulators and semiconductors.

vii. How does the motion of an electron in a n-type substance differ from the motion of holes in a p-type substance?

viii. Why ordinary silicon diodes do not emit light?

ix. Define rectification. Draw a circuit diagram for half wave rectification.

x. What is meant by A.M. and F.M.?

xi. What is choke? Why is it better as compared to a resistor to limit the current?

xii. Write down any two properties of series resonance circuit.

Q.4 **Write short answers to any SIX (6) questions: 12**

i. Write four methods to change magnetic flux.

ii. Is it possible to change both the area of the loop and the magnetic field passing through the loop and still not have an induced emf in the loop?

iii. Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?

iv. Why wave properties are predominate in radio wave? Explain.

v. What is the energy of a photon of 400 nm?

vi. We do not notice the de Broglie wavelength for a pitched cricket ball. Explain Why?

vii. Can pair production take place in vacuum? Explain.

viii. What are advantages of laser over ordinary light?

ix. Using uncertainty principle, $\Delta x \Delta p = \frac{h}{2\pi}$. If diameter of nucleus is of the order of 10^{-14}m, prove that electron cannot reside the nucleus.

SECTION – II

Note: **Attempt any THREE questions.**

Q.5(a) State and explain Kirchhoff's 2nd rule. 5

(b) Two point charges $q_1 = -1\times10^{-6}$C and $q_2 = 4\times10^{-6}$C are separated by a distance of 3.0 m. Find and justify the zero-field location. 3

Q.6(a) State and explain Lenz's law. Explain how Lenz's law is also a statement of law of conservation of energy. 5

(b) How fast must a proton move in a magnetic field of 2.50×10^{-2}T such that the magnetic force is equal to its weight? 3

Q.7(a) How can we use an operational amplifier as a comparator? Discuss working of operational amplifier as night switch in comparator mode. 5

(b) What is the resonant frequency of a circuit which includes a coil of inductance 2.5 H and a capacitance 40μF? 3

Q.8(a) Discuss the mechanism of electrical conduction by holes and electrons in a pure semi-conductor element. 5

(b) Yellow light of 577 nm wavelength is incident on a cesium surface. The stopping voltage is found to be 0.25 V. Find (i) the maximum K.E. of the photoelectrons. (ii) the work function of cesium. 3

Q.9(a) Derive an expression for the quantized radii and energies of the orbits of hydrogen atom. 5

(b) The half-life of $^{91}_{38}Sr$ is 9.70 hours. Find its decay constant. 3