Sig. of Supdt.

KT-XII-14(A)

PHYSICS - (Part-II)

Roll No.

Fic. No.....

Fic. No.....

Time Allowed : 3 Hrs. **Total Marks : 85**

Note: There are three sections of this paper, A, B, & C. Carefully read the instructions for each section and attempt accordingly.

Time Allowed : 20 Mins. **SECTION – A** **Total Marks : 18**

Note: Use this sheet for this section. No. mark will be awarded for cutting, erasing or over writing.

Q. 1 Insert the correct option (a, b, c, d) in the empty box opposite to each part. Each part carries one mark. Any kind of Mark Left / Written is strictly prohibited. Mobile Phone is strictly prohibited in Examination Hall.

i) The insertion of dielectric between the plates of a capacitor ..... its capacitance.
(a) Increase (b) Decrease (c) Remain the same (d) None of them

ii) 1 ohm x 1 farad is equivalent to .....
(a) 1sec (b) 2sec (c) 3sec (d) None of theme

iii) The vessal containing the two electrodes and the electrolyte is known as .....
(a) Ammeter (b) Galvnometer (c) Voltmeter (d) Voltameter

iv) There is no magnetic force on a charged particle moving ..... To the magnetic field
(a) Parallel (b) Perpendicular (c) At angle 270° (d) None of these

v) Torque on a current carrying coil in magnetic field is .....
(a) $\tau = NAB\cos\alpha$ (b) $\tau = NiAB\cos\alpha$ (c) $\tau = NiAB\sin\alpha$ (d) $\tau = NiAB\tan\alpha$

vi) The magnitude of motional electromotive force is .....
(a) BiL (b) Bilv (c) BLv (d) Biv

vii) The unit of magnetic flux density is .....
(a) Wbm^{-2} (b) Tesla (c) $NA^{-1}\,m^{-1}$ (d) All

viii) At the resonant frequency in RLC Series circuit, the circuit impedance is .....
(a) Maximum (b) Minimum (c) Zero (d) None of them

ix) A changing magnetic flux gives rise to .....
(a) Electric field (b) Magnetic field (c) Gravitational field (d) None of them

x) A pure semi conductor behave like an insulator at temperature near .....
(a) 0C° (b) 0F° (c) 0 K (d) 100 C°

xi) Identify the polymer substance among the following.
(a) Glass (b) Iron (c) Plastic (d) Copper

xii) In inverting amplifier the amplifier gain "G" is .....
(a) $-\frac{R_1}{R_2}$ (b) $1+\frac{R_2}{R_1}$ (c) $-\frac{R_2}{R_1}$ (d) $+\frac{R_2}{R}$

xiii) A diode characteristic curve is graph between .....
(a) Current and time (b) Voltage and time
(c) Voltage & current (d) Forward voltage & reverse voltage

xiv) A positron has mass equal to that of .....
(a) Proton (b) Neutron (c) Electron (d) Neutrino

xv) The rest mass of photon (x-ray) is .....
(a) Infinite (b) 9.1×10^{-31} kg (c) Zero (d) 1.6×10^{-27} kg

xvi) In bohr's modal of H.atom, the radi of electron orbits are related to the quantum number "n" is .....
(a) $\gamma_n \alpha n$ (b) $\gamma_n \alpha n^2$ (c) $\gamma_n \alpha \frac{1}{n}$ (d) $\gamma_n \alpha \frac{1}{n^2}$

xvii) Light amplification by stimulated emission of radiation means: -
(a) X-rays (b) Gamma rays (c) Laser (d) Maser

xviii) Nuclear force is .....
(a) Repulsive and long range (b) Repulsive and short range
(c) Attractive and short range (d) Attractive and long range

KT-XII-14(A)

PHYSICS - (Part-II)

Time Allowed : 2:40 Hrs. Total Marks : 67

Section – B

Marks : 40

Note : Mobile Phone is strictly banned in Examination Hall.

Q. 2 Answer any TEN parts of the following short questions.

(i) State some similarities and some differences between electric field and gravitational field.

(ii) Why a thin region of light bulb filament has more possibility to burn than the thicker one?

(iii) If there are 10^{18} electrons flowing through any cross-section of a wire in 1 minute. What is the current in the wire?

(iv) Explain the concept of magnetic force.

(v) Why is the magnetic field strength greater inside a current-carrying loop of wire?

(vi) An certain solenoid 0.5m long and $4Cm^2$ area of cross-section has 1000 turns per unit length. What is self inductance?

(vii) How is p-type semiconductor prepared?

(viii) Why ordinary silicon diodes emits light?

(ix) Why must the rest mass of a photon be zero?

(x) What is meant by wave particle-duality?

(xi) How can the line spectrum be used for identification of elements?

(xii) What do we mean by the term critical mass?

(xiii) Why are heavy nuclei unstable?

Section – C

Marks : 27

NOTE : Attempt any three questions. Each question carries equal marks.

Q. 3 a) State Gauss's law for Electrostatic, by using this law find the Electric field intensity due to infinite sheet of charge.

b) A potential difference of 2.4×10^4 volts maintains a downward directed electric field between two horizontal parallel plates separated by 1.8cm. Find the charge on an oil droplet of mass 2.2×10^{-13} Kg which remains stationary between the plates.

Q. 4 a) Show that the energy stored in the magnetic field of an inductor of self inductance L and carrying current I is given $U_m = \frac{1}{2} LI^2$.

b) A long solenoid has 5000 loops of wire on its 80cm length. The diameter of the solenoid is 2cm. Find B inside the solenoid when a current of 300 m A flows in it.

Q. 5 a) What is photoelectric effect. Summarize the observation made in connection with phenomenon?

b) What is the shortest wave length radiation in the Balmar series? What value of "n" must be used?

Q. 6 Write a short notes on any two of the following.

a) Three phase AC supply b) Energy band theory

c) Wheat stone bridge d) Natural radioactivity