Sig. of Supdt.	XT-XII-1661 **PHYSICS** (Part – II) (Fresh / New Course)	Roll No. .....

Fic. # .....

Fic. # .....

Total Marks: 85 | **PHYSICS** (Part – II) (Fresh / New Course) | Time Allowed : 3 Hrs.

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

NOTE : Section-A is compulsory. All parts of this section to be answered on the questions paper itself. It should be completed in the given time and handed over to the Centre Superintendent. Deleting / Overwriting is not allowed. Do not use lead pencil.

NOTE : Insert the correct option (a, b, c, d) in the empty box opposite to each part.

Q. 1 Insert the correct option (a, b, c, d) in the empty box opposite to each part. Each part carries one mark.

i– Electric potential of earth is taken to be zero because the earth is good; [B]
(a) Semi conductor (b) Conductor (c) Insulator (d) Dielectric

ii– The resistance of pure ....increase with the increase of temperature. [C]
(a) Insulator (b) Semi conductor (c) Metal (d) Electrolytes

iii– When a wire is stretched and its radius becomes $\frac{r}{2}$ then its resistance will be ; [D]
(a) 16 R (b) 4 R (c) 2 R (d) 0

iv– The magnetic force is .....when charge particle moves parallel to the magnetic field. [A]
(a) Zero (b) Minimum (c) Maximum (d) None of these

v– The Weber is unit of measure of .....; [C]
(a) Conductance (b) Electric current (c) Magnetic flux (d) Electric flux

vi– To measure the earthquakes we use a device which is called ..... [B]
(a) Potentiometer (b) Seismometer (c) EEG (d) None of these

vii– The circuit in which current and voltage are in phase, the power factor is ..... [B]
(a) 0 (b) 1 (c) -1 (d) 2

viii– .....shows that a changing magnetic field give rise to an electric field. [C]
(a) Ampere's law (b) Lentiz law (c) Faraday's law (d) None of these

ix– In a coil current change from 2 to 4 A in 0.05 S. If the average induced emf is 8V then coefficient of self inductance is ..... [A]
(a) 0.2 henry (b) 0.1 henry (c) 0.8 henry (d) 0.04 henry

x– Ferromagnetic materials are ..... [A]
(a) Strongly attracted by magnet (b) Weakly attracted by magnet
(c) Strongly repelled by a magnet (d) Weakly repelled by a magnet

xi– In a transistor, collector current is controlled by ; [D]
(a) Collector voltage (b) Base current (c) Collector resistance (d) All of these

xii– Optional amplifier can amplify ..... [ ]
(a) AC only (b) DC only (c) Both A and B (d) None of these

xiii– The positron has charge which is in magnitude equal to the charge on ..... [D]
(a) Electron (b) Proton (c) β – particle (d) None of these

xiv– Pair production is not possible in ..... [C]
(a) Air (b) Water (c) Vacuum (d) None of these

xv– Balmer series lies in the part of electromagnetic spectrum that is ..... [A]
(a) Visible (b) Infrared (c) Ultraviolet (d) x-rays

xvi– In accordance with Bohr's theory the K.E. of the electron is equal to ..... [A]
(a) $\frac{1}{2}\frac{Ze^2}{r}$ (b) $\frac{Ze^2}{r}$ (c) $\frac{Ze^2}{r^2}$ (d) $\frac{1Ze^2}{2r^2}$

xvii– In nuclear reactors, the fission chain reaction is controlled by ..... [D]
(a) Moderators (b) Coolant (c) Graphite (d) Boron rods

xviii– Electric flux area is considered as .... [A]
(a) Vector (b) Scalar (c) a, b both (d) none of these

KT-XII-1601 156

PHYSICS
(Part – II)
(Fresh / New Course)

Total Marks : 67

Time Allowed : 2:40 Hrs. **Section – B** Marks : 40

Q. 2 Write short answers of any TEN of the following parts. Each part carries equal marks.

(i) Voltages are always measured between two points. Why?
(ii) Under what circumstances can the terminal P.D of a battery exceed its e.m.f.?
(iii) Can neutrons be accelerated in a cyclotron? Give reason.
(iv) What factors limit the size of the back e.m.f.?
(v) What determines the gradient of a graph of inductive reactance against frequency?
(vi) What is meant by the elastic limit of a material?
(vii) A-P-type semi conductors has a large number of holes but still it is electrically neutral. Why?
(viii) All objects radiate energy. Explain Why, then, are we not able to see objects in a dark room?
(ix) What is optical pumping?
(x) What factors make a fusion reaction difficult to achieve?
(xi) What is thermister? Describe some practical application of thermister.
(xii) Describe the mechanical properties of solids.
(xiii) What are the main features of photoelectric effect?

Section – C

Marks : 27

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

Q. 3 (a) Define capacitance of a capacitor. Derive an expression for the capacitance of a parallel plate capacitor when dielectric is inserted between the plate of a capacitor.

(b) A heating coil has a resistance of 20Ω. It is designed to operate on 220 V. What electrical energy in joules is supplied to the heater in 10 S.

Q. 4 (a) State Ampere's law and use it to derive an expression for magnetic field of a solenoid.

(b) An inductor with an inductance of 100μH passes a current of 10 mA when its terminal voltage is 6.3 V. Calculate the frequency of A.C supply.

Q. 5 (a) What are Bohr's postulates about hydrogen atom? Derive an expression for the radii of electron orbit.

(b) The half life of radioactive nucleus $_{86}Ra^{226}$ is 1.6×10^3 years. Determine the decay constant.

Q. 6 Write short note on any TWO of the following.

(a) GM counter
(b) Laser
(c) Electric polarization
(d) Maxwells equation