Paper Code Number: 4471	2025 (1st-A) INTERMEDIATE PART-II (12th Class)	Roll No:

PHYSICS PAPER-II GROUP-I

TIME ALLOWED: 20 Minutes | **OBJECTIVE** | **MAXIMUM MARKS: 17**

Q.No.1 **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.**

S.#	QUESTIONS	A	B	C	D
1	The electric field created by positive point charge is:	Radially outward	Radially inward	Circular	Oblique
2	The electric intensity due to infinite positive sheet of charge is:	$\frac{q}{\varepsilon_o}$	$\frac{\sigma}{2\varepsilon_o}$	$\frac{q}{A}$	Zero
3	In carbon resistor, the value of blue colour is:	7	8	6	9
4	Output waveform of sweep or time base generator is:	Square wave	Sinusoidal wave	Rectangular wave	Saw tooth wave
5	A voltmeter is always connected in circuit in:	Series	Parallel	Perpendicular	Tangent
6	Maximum emf generated in a generator:	$\varepsilon_o = NWAB$	$\varepsilon = NWAB\sin\theta$	$\varepsilon = \varepsilon_o \sin\theta$	$\varepsilon_o = \varepsilon \sin\theta$
7	A device which uses phenomenon of mutual induction:	Motor	Television	Transformer	Transistor
8	The device which allows only the flow of D.C is:	Capacitor	Generator	Transformer	Inductor
9	As $P = I_{rms} \times V_{rms}\cos\theta$, in this $\cos\theta$ is:	Gain factor	Power factor	Loss factor	Phase factor
10	Application of superconductor is:	$x-ray$	Microwave oven	Laser	MRI
11	Transistor stand for:	Transfer of resistance	Transfer of charge	Transfer of voltage	Transfer of current
12	A sensor of light is:	Transistor	LED	Light dependent resistance	Diode
13	Radiation emitted by a human body at normal temperature lies in:	x – rays region	Ultraviolet region	Visible region	Infrared region
14	The value of Plank's constant is:	$6.63\times10^{-34}\,Js^2$	$6.63\times10^{34}\,Js$	$6.63\times10^{34}\,Js^2$	$6.63\times10^{-34}\,Js$
15	Photon emitted in inner shell transition are:	Energetic x – rays	Characteristic x - rays	Continuous x – rays	Discontinuous x – rays
16	Radiotherapy is generally done with x – rays emitted from:	Strontium – 90	Iodine – 131	Sodium – 24	Cobalt – 60
17	The binding energy per nucleon is maximum for:	Uranium	Lithium	Iron	Oxygen

INTERMEDIATE PART-II (12th Class)	2025 (1st-A)	Roll No: _____
PHYSICS PAPER-II GROUP-I		
TIME ALLOWED: 2.40 Hours	SUBJECTIVE	MAXIMUM MARKS: 68

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. **8 × 2 = 16**

(i)	The potential is constant throughout a given region of space. Is the electric field zero or non-zero in this region? Explain.
(ii)	Electric lines of force never cross. Why?
(iii)	A particle carrying a charge of $2e$ falls through a potential difference of $3.0V$. Calculate the energy acquired by it in eV.
(iv)	Why the capacitance of a capacitor increase by inserting a dielectric between the plates of a capacitor?
(v)	Suppose that a charge q is moving in a uniform magnetic field with a velocity v. Why is there no work done by the magnetic force that acts on charge q?
(vi)	Why the voltmeter should have a very high resistance?
(vii)	Find the value of magnetic field that will cause a maximum force of $2.0 \times 10^{-3} N$ on a $10cm$ straight wire carrying a current of $5A$.
(viii)	Explain the right hand rule to find the direction of magnetic field inside a current carrying solenoid.
(ix)	If a nucleus has a half life of 1 year, does this mean that it will be completely decayed after 2 years? Explain.
(x)	What factors make a fusion reaction difficult to achieve?
(xi)	What are Gauge bosons? Give any two examples.
(xii)	Explain p–p reaction in sun with the help of equations.

3. Attempt any eight parts. **8 × 2 = 16**

(i)	A potential difference is applied across the ends of a copper wire. What is the effect on the drift velocity of free electrons by (i) increasing the potential difference (ii) decreasing the length and temperature of the wire
(ii)	What are the difficulties in testing whether the filament of the lighted bulb obeys Ohm's law?
(iii)	What will be the numerical value of carbon resistance? When first, second and third bands are red, violet and orange respectively?
(iv)	How many times per second will an incandescent lamp reach maximum brilliance when connected to a $50Hz$ source?
(v)	How does doubling the frequency affect the reactance of (a) an inductor (b) a capacitor?
(vi)	A sinusoidal current has peak value of $14.14A$. What will be its rms value?
(vii)	What is meant by para, dia and ferromagnetic substance?
(viii)	What is doping? With doping, resistance of semiconductor increases or decreases.
(ix)	Explain forbidden energy gap.
(x)	Why a photo diode is operated in reverse biased state?
(xi)	Why charge carriers are not present in the depletion region?
(xii)	Write Boolean expression and truth table of exclusive-NOR gate.

4. Attempt any six parts. **6 × 2 = 12**

(i)	Differentiate between mutual induction and mutual inductance.
(ii)	Define energy density in case of inductor and write its formula.
(iii)	Does the induced emf in a circuit depend on the resistance of the circuit? Does the induced current depend on the resistance of the circuit?
(iv)	Differentiate between inertial frame of reference and non-inertial frame of reference.
(v)	Draw the characteristic curves of photocurrent versus applied voltage for light of different frequencies.
(vi)	Will bright light eject more electrons from a metal surface than dimmer light of the same colour?
(vii)	Why don't we observe a Compton effect with visible light?
(viii)	What are biological effects of X – rays?
(ix)	Is energy conserved when an atom emits a photon of light?

SECTION-II

NOTE: Attempt any three questions. **3 × 8 = 24**

5.(a)	Discuss the charging and discharging of a capacitor in detail.	05
(b)	A charge of $90C$ passes through a wire in 1 hour and 15 minutes. What is the current in the wire?	03
6.(a)	Derive the relation for the energy stored in an inductor in terms of magnetic field strength.	05
(b)	A power line $10.0m$ high carries a current $200A$. Find the magnetic field of the wire at the ground.	03
7.(a)	Define p-n Junction. How does p-n junction work in forward biased and reverse biased?	05
(b)	A $10mH, 20\Omega$ coil is connected across $240V$ and $\frac{180}{\pi} Hz$ source. How much power does it dissipate?	03
8.(a)	What is wave nature of particles? How Davisson and Germer experiment confirmed it?	05
(b)	A $1.0m$ long copper wire is subjected to stretching force and its length increased by $20cm$. Calculate the tensile strain and percent elongation which the wire undergoes?	03
9.(a)	Explain in detail the nuclear fission and fission chain reaction.	05
(b)	What is the energy in eV of quanta of wavelength, $\lambda = 400nm$?	03