Paper Code Number: 4478	2024 (1^{st}-A) INTERMEDIATE PART-II (12^{th} Class)	Roll No: MTN-2-24
PHYSICS PAPER-II GROUP-II		
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	Half life of uranium–239 is:	24.5 min	25.5 min	23.5 min	26.5 min
2	The building blocks of protons and neutrons are called:	Positron	Quarks	Electron	Neutron
3	If the medium between the charges is not free space, then electrostatic force will:	Increase	Decrease	Remains constant	Infinite
4	Negative sign in equation $E = -\frac{\Delta V}{\Delta r}$ shows:	Decreasing potential	Increasing potential	Increasing strength	Magnitude
5	Reciprocal of resistivity is called:	Inductance	Conductance	Conductivity	Resistance
6	A charged particle enters in a strong magnetic field its K.E:	Increases	Infinite	Decreases	Remains same
7	When a charged particle is projected perpendicular to a uniform magnetic field, its path is:	Helix	Circular	Spiral	Ellipse
8	If the angular frequency of A.C generator is doubled, the time period will be:	Doubled	Four times	Half	One fourth
9	Split ring are used in:	D.C motor	Transformer	A.C generator	A.C motor
10	Root mean square value of voltage is:	$\sqrt{2}V_o$	$\frac{V_o}{2}$	$\frac{V_o}{\sqrt{2}}$	$2V_o$
11	The phase of A.C at positive peak from origin is:	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{2}$	π
12	Which is pentavalent impurity?	Gallium	Boron	Indium	Antimony
13	Which component of the transistor has lowest concentration of impurity?	Base	Emitter	Collector	Resistor
14	Bolean expression for AND gate is:	$X = A + B$	$X = \overline{A \cdot B}$	$X = A \cdot B$	$X = \overline{A + B}$
15	Compton shift for wavelength is minimum for scattering angle $\theta =$	90^o	0^o	45^o	270^o
16	At higher energies more then 1.02 MeV the dominant process is:	Compton effect	Photoelectric effect	Fission process	Pair production
17	Electron normally can reside in excited state for about:	$10^{-8}s$	$10^{-3}s$	$10^{-6}s$	$10^{8}s$

INTERMEDIATE PART-II (12th Class)	2024 (1st-A)	Roll No:
PHYSICS PAPER-II GROUP-II		
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

MTN-2-24

2. Attempt any eight parts. $8 \times 2 = 16$

(i)	Describe the force or forces on a positive point charge when placed between parallel plates. (a) with similar and equal charges (b) with opposite and equal charges
(ii)	Do electrons tend to go to region of high potential or of low potential?
(iii)	Two opposite point charges, each of magnitude q are separated by a distance $2d$. What is the electric potential at a point P mid way between them?
(iv)	Sketch the graphs for charging and discharging of a capacitor.
(v)	How can a current loop be used to determine the presence of a magnetic field in a given region of space?
(vi)	How can you use a magnetic field to separate isotopes of chemical element?
(vii)	How can a galvanometer be converted into an ammeter? Also write down the formula to adjust the shunt resistance.
(viii)	Define CRO and write down its principle.
(ix)	If a nucleus has half-life of 1 year, does this mean that it will be completely decayed after 2 years? Explain.
(x)	What do you understand by "background radiation"? State two sources of this radiation.
(xi)	Explain the effects of low level radiation and high level radiation.
(xii)	Explain the p-p reaction in the sun with the help of equations.

3. Attempt any eight parts. $8 \times 2 = 16$

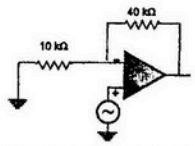
(i)	Give two differences between Electromotive force and Potential difference.
(ii)	What is Open circuit and Closed circuit?
(iii)	Calculate the terminal potential difference across an external resistance when a current 0.5A flowing in a circuit. The emf is 2V and source of emf has internal resistance 1Ω.
(iv)	Name the device that will (a) permit flow of direct current but oppose the flow of alternating current (b) permit flow of alternating current but not the direct current
(v)	How the reception of a particular radio station is selected on your radio set?
(vi)	Find the capacitance required to construct a resonance circuit of frequency 1000kHz with an inductor of 5mH.
(vii)	Define Proportional limit and Ultimate tensile strength.
(viii)	How n-type semi conductor is formed by the process of doping?
(ix)	What is the difference between Ferromagnetic and Paramagnetic substances?
(x)	What is Electronics? Write down only names of electronic devices (at least two).
(xi)	Why +ve terminal of a battery is connected with p-type and –ve terminal with n-type region.
(xii)	Explain briefly Light emitting diode.

4. Attempt any six parts. $6 \times 2 = 12$

(i)	What is to be done in order to enhance the magnetic flux in transformer?
(ii)	In a certain region, the earth's magnetic field points vertically down. When a plane flies due north, which wingtip is positively charged?
(iii)	Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?
(iv)	State Stefen-Boltzmann law and write its mathematical relation.
(v)	The classical theory cannot explain the threshold frequency of light. Why? Explain.
(vi)	If an electron and a proton have the same de Broglie wavelength, which particle has greater speed?
(vii)	What advantages an electron microscope has over an optical microscope?
(viii)	How line spectra can be used for the identification of elements? Explain.
(ix)	Explain why laser action cannot occur without population inversion between atomic levels?

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)	Define Xerography. Draw the schematic diagram of a photocopier and explain its working.	05
(b)	How many electrons pass through an electric bulb in one minute if the 300 mA current is passing through it?	03
6.(a)	State Ampere's law. Apply it to find magnetic field inside the solenoid.	05
(b)	A D.C motor operates at 240V and has a resistance of 0.5Ω. When the motor is running at normal speed, the armature current is 15A. Find the back emf in the armature.	03
7.(a)	Describe the A.C through R.C series circuit.	05
(b)	Calculate the gain of non-inverting amplifier as shown in given figure: 	03
8.(a)	What is Compton effect? Derive relation for Compton shift? Also discuss it for $\theta=0°$ and $\theta=90°$	05
(b)	The length of a steel wire is 1.0 m and its cross-sectional area is $0.03 \times 10^{-4} m^2$. Find the work done in stretching the wire when a force of 100N is applied on it. Where $Y = 3.0 \times 10^{11} Nm^{-2}$.	03
9.(a)	What is Nuclear Reactor? Describe function of its main parts.	05
(b)	The wavelength of $K\ X-$ ray from copper is $1.377 \times 10^{-10} m$. What is the energy difference between the two levels from which this transition results?	03