PAPER CODE – 8471

12th CLASS – 2nd Annual 2025

PHYSICS		TIME : 20 MINUTES
GROUP : FIRST		MARKS :17

OBJECTIVE

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question.

QUESTION NO. 1

1 One Joule is equal to
(A) 6.25×10^{18} ev (B) 6.25×10^{-18} ev (C) 1.6×10^{-19} ev (D) 1.6×10^{19} ev

2 Oil droplets are charged by
(A) Elastic collision (B) Inelastic collision (C) Friction (D) Excitation

3 A zero ohm resistance is indicated by a
(A) Single black band (B) Single blue band (C) Two black and blue band (D) Single red band

4 In **ohmmeter** , deflection of coil is due to
(A) External emf (B) External current (C) Bult in cell (D) Solar energy

5 In **CRO** , the voltage applied across **x** plates is
(A) Pulsating voltage (B) Square voltage (C) Sinusoidal voltage (D) Saw tooth voltage

6 In motor, the induced **emf** is half of applied voltage V and resistance of coil is **10 Ω**. The current will be
(A) $\frac{3V}{2R}$ (B) $\frac{V}{2R}$ (C) $\frac{V}{R}$ (D) $\frac{2V}{R}$

7 In step up transformer , ratio of output voltage to input is **2**. The turn ratio will be
(A) $^1/_2$ (B) **2** (C) **4** (D) **0.1**

8 The expression for power in **A.C** is $V_{rms}\, I_{rms}\, \cos\theta$. The factor $\cos\theta$ is called
(A) Energy factor (B) Current factor (C) Voltage factor (D) Power factor

9 In case of resistance when **A.C** is passing , current and voltage are
(A) Out of phase (B) In phase (C) Phase difference of 45° (D) Phase difference of 60°

10 A metallic conductors conduct electricity because they have large number of free
(A) Holes (B) Ions (C) Electrons (D) Protons

11 Resistance between positive and negative input of operational amplifier is
(A) Very high (B) Very low (C) Zero (D) Infinity

12 Voltage gain in inverting operational amplifier is
(A) $R_1 + R_2$ (B) $R_1 - R_2$ (C) $^{R_1}/_{R_2}$ (D) $^{-R_2}/_{R_1}$

13 Momentum and wavelength of a photon are related as
(A) $P = {}^h/_\lambda$ (B) $P = h\lambda$ (C) $P = h\lambda^2$ (D) $P = h^{-1}\lambda$

14 For black body radiation , Stefen's Boltzmann law is
(A) $E = \sigma T$ (B) $E = \sigma T^2$ (C) $E = \sigma T^3$ (D) $E = \sigma T^4$

15 In general , number of spectra produced by atoms are
(A) 2 (B) 1 (C) 3 (D) 4

16 $^{17}_{8}O + {}^{1}_{1}H \longrightarrow X + {}^{4}_{2}He$. In above nuclear reaction **X** is
(A) $^{12}_{6}C$ (B) $^{14}_{7}N$ (C) $^{7}_{3}Li$ (D) $^{4}_{2}He$

17 A ventilation can reduce radon level inside the
(A) Buses (B) Cars (C) Building (D) Sewerage

12th CLASS – 2nd Annual 2025

PHYSICS
GROUP : FIRST

SUBJECTIVE PART

TIME: 2 HRS 40 MINUTES
MARKS: 68

SECTION – I

QUESTION NO. 2 Write short answers to any Eight (8) of the following 16

i	What informations we get from the map of electric field lines ?
ii	What is electric flux ? Write its formula
iii	How can you identify that which plate of a capacitor is positively charged ?
iv	Describe the force or forces on a positive point charge when placed between parallel plates with similar and equal charges
v	Two long parallel wires carrying currents I_1 and I_2 in the same direction attract each other. Why ? Explain
vi	Define magnetic flux density and its unit
vii	If a charged particle moves in a straight line through some region of space, can you say that the magnetic field in the region is zero ?
viii	How can you use a magnetic field to separate isotopes of chemical element ?
ix	Prove that **1amu = 931 Mev**
x	What is half-life of a radioactive element ? Write its formula
xi	A particle which produces more ionization is less penetrating. Why ?
xii	How can radioactivity help in the treatment of cancer ?

QUESTION NO. 3 Write short answers to any Eight (8) of the following 16

i	What are the difficulties in testing whether the filament of a lighted bulb obeys **Ohm's Law** ?
ii	What is conventional current ?
iii	How will you indicate a zero - ohm carbon resistor ?
iv	In a **R-L** circuit, will the current lag or lead the voltage ? Illustrate your answer by a vector diagram
v	How the reception of a particular radio station is selected on your radio set ?
vi	At what frequency will an inductor of 1.0 H have a reactance of **500 Ω** ?
vii	What is the significance of area of hysteresis loop ?
viii	Define high temperature superconductor. Give one example
ix	Distinguish between paramagnetic and diamagnetic substances
x	Describe the working of light emitting diode **(LED)**.
xi	Why charge carriers are not present in the depletion region ?
xii	Why is the base current in a transistor very small ?

QUESTION NO. 4 Write short answers to any Six (6) of the following 12

i	Show that $\in$ and $\frac{\Delta\phi}{\Delta t}$ have the same units
ii	Does the induced **emf** always act to decrease the magnetic flux through a circuit ?
iii	How the fluctuations in output of **DC** generator can be made smooth ?
iv	Can pair production take place in vacuum ? Explain
v	Which has low energy quanta ? Radio waves or **X – rays**
vi	What is construction of a photocell ? Write its some uses
vii	Absolute uniform motion cannot be detected. Justify
viii	What do we mean when we say that the atom is excited ?
ix	What is difference in excitation mechanism of gas molecules by photons and electrons ?

SECTION-II

Note: Attempt any Three questions from this section (Part A = 5 Marks & Part B = 3 Marks 8 x 3 = 24)

Q.5.(A)	Explain resistivity and conductance. What is the effect of temperature on resistance and resistivity ?
(B)	A point charge **q = - 8.0 x 10^{-8} C** is place at the origin. Calculate electric field at a point **2.0 m** from the origin on the **Z – axis**
Q.6.(A)	State and explain the **Ampere's Law** ? Also calculate the magnetic field due to a current carrying solinoid by using **Ampere's Law**
(B)	A square coil of side **16 cm** has **200 turns** and rotates in a uniform magnetic field of magnitude **0.05 T**. If the peak **emf** is **12V** , what is the angular velocity of the coil ?
Q.7.(A)	Explain the working of a comparator as a " **Night switch** "
(B)	Find the value of current flowing through a capacitance **0.5 μF** when connected to a source of **150 V** and **50 Hz**
Q.8.(A)	How Werner Heisenberg proposed uncertainity principle for the development of quantum mechanics ? Explain
(B)	A **1.25 cm** diameter cylinder is subjected to a load of **2500 kg**. Calculate the stress on the bar in **mega Pascals**
Q.9.(A)	Explain inner shell transition of electrons for the production of **X – rays**. Also differentiate between characteristic **X – rays** and continuous **X – rays**
(B)	The half-life of $^{91}_{38}Sr$ is **9.70 hours**. Find its decay constant