Paper Code Number: 4473	2023 (1^{st}-A) INTERMEDIATE PART-II (12^{th} 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	Root mean square value of an alternating voltage is:	$\frac{V_o^2}{\sqrt{2}}$	$\frac{V_o}{\sqrt{2}}$	$\frac{V_o^2}{2}$	$\frac{V_o}{2}$
2	Power dissipated in a pure inductor is:	Zero	Infinite	Small	Maximum
3	The value of potential barrier for silicon at room temperature is:	$0.3V$	$0.5V$	$0.7V$	$0.9V$
4	The ratio of impurity addition in an intrinsic semiconductor is:	1 to 10^3	1 to 10^4	1 to 10^5	1 to 10^6
5	SI unit of current gain of transistor is:	Coulomb	Ampere	No unit	Farad
6	When platinum wire is heated, it appears cherry red at temperature:	$500°C$	$900°C$	$1100°C$	$1300°C$
7	A photocell is base on:	Photoelectric effect	Polarization	Time dilation	Compton effect
8	Normally an electron can reside in excited state for about:	$10^{-2}s$	$10^{-4}s$	$10^{-8}s$	$10^{-6}s$
9	Dead time of the counter is:	$\sim 10^{-1}s$	$\sim 10^{-6}s$	$\sim 10^{-8}s$	$\sim 10^{-5}s$
10	The building blocks of protons and neutrons are called:	Quarks	Electrons	Protons	Ions
11	The concept of an electric field was introduced by:	Henry	Faraday	Watt	Oersted
12	Electric field intensity due to an infinite sheet of charge is:	$E = \frac{2\sigma}{\varepsilon_o}$	$E = 2\sigma\varepsilon_o$	$E = \frac{\sigma}{2\varepsilon_o}$	$E = \frac{\sigma}{\varepsilon_o}$
13	The value of drift velocity of electrons is of the order of:	$10^3 ms^{-1}$	$10^2 ms^{-1}$	$10^{-3} ms^{-1}$	$10^{-2} ms^{-1}$
14	Formula for shunt resistance R_s is:	$R_s = \frac{I_g}{I-I_g}R_g$	$R_s = \frac{V_g}{I-I_g}R_g$	$R_s = \frac{I-I_g}{I_g}R_g$	$R_s = \frac{I-I_g}{I_g R_g}$
15	Voltmeter is connected in the circuit in:	Perpendicular	Parallel	Series	Anti parallel
16	The principle of an A.C. generator is base on:	Mutual Induction	Lenz's law	Self induction	Faraday's law of electromagnetic induction
17	When the motor is just started, back emf always:	Becomes zero	Decreases	Remains same	Increases

INTERMEDIATE PART-II (12th Class)

PHYSICS PAPER-II GROUP-I | SUBJECTIVE | MAXIMUM MARKS: 68

TIME ALLOWED: 2.40 Hours

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. $8 \times 2 = 16$

(i) State Gauss's law.

(ii) What is the function of ECG?

(iii) Do electrons tend to go to region of high potential or of low potential?

(iv) Draw q – t curve for charging process and from this curve define capacitive time constant.

(v) Define tesla and write relation between tesla and Gauss.

(vi) Why a voltmeter is always connected in parallel in circuit?

(vii) If the length of the solenoid is doubled by keeping number of turns constant for steady current then what should be the new value of the magnetic field?

(viii) If a charged particle moves in a straight line through some region of space, can you say that magnetic field in that region is zero?

(ix) Name the six quarks.

(x) What is the function of dosimeter?

(xi) What are isotopes? What do they have in common and what their differences?

(xii) Discuss the advantages and disadvantages of fission power from the point of safety, pollution and resources.

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

(i) Do bends in a wire affect its electrical resistance? Explain.

(ii) Describe a circuit which will give a continuously varying potential.

(iii) What is a series resistance circuit? How would equivalent resistance be calculated in such circuit?

(iv) A sinusoidal current has rms value of 10A. What is maximum or peak value?

(v) How the reception of a particular radio station is selected on your radio set?

(vi) What is power factor of a pure (a) resistive circuit (b) inductive circuit?

(vii) What is meant by strain energy? How can it be determined from force-extension graph?

(viii) How would you justify that Young's modulus of fluids is zero?

(ix) How existing view of magnetism forbids presence of an isolated magnetic pole?

(x) Why ordinary silicon diodes do not emit light?

(xi) Draw circuit diagram of half wave rectifier and its output waveform for sinusoidal input.

(xii) Define open loop voltage gain of an operational amplifier. What is its value for a typical operational amplifier?

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

(i) Is it possible to change both the area and the magnetic field passing through the loop and still not have an induced emf in the loop?

(ii) Can a step-up transformer increase the power level?

(iii) Why self induced emf is also called as back emf?

(iv) A beam of red light and a beam of blue light have exactly the same energy. Which bean contains the greater number of photons?

(v) Why don't we observe a Compton effect with visible light?

(vi) Describe the dual nature of energy and matter.

(vii) Which has the lower energy quanta? Radiowaves or X-rays?

(viii) Why Neon is mixed with Helium in Ne – He laser?

(ix) What do we mean when we say that the atom is excited?

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 2$

5.(a) Derive the relation for capacitance of parallel plate capacitor and hence define dielectric constant.

(b) A platinum wire has resistance of 10Ω at $0°C$ and 20Ω at $273°C$. Find the value of temperature co-efficient of resistance of platinum.

6.(a) Drive an expression of force on a moving charge in a magnetic field.

(b) A Square coil side 16cm has 200 turns and rotates in a uniform magnetic field of magnitude 0.05T If the peak emf is 12V. What is angular velocity of coil?

7.(a) What is rectification? Draw diagram and explain working of full wave rectifier.

(b) Find the value of the current and inductive reactance when A.C. voltage of 220V at 50Hz is passe through an inductor of 10H.

.(a) What is photoelectric effect? How its different results were successfully explained by Einstein?

(b) A 1.0m long copper wire is subjected to stretching force and its length increases by 20cm. Calculate the tensile strain and the percent elongation which the wire undergoes.

.(a) What is mass defect and binding energy? Draw the graph between binding energy per nucleus nucleus number. Also explain this curve.

(b) Electrons in an X-ray tube are accelerated through a potential difference 3000V. If these electr are slow down in a target, what will be the minimum wavelength of X-rays produced?