PHYSICS PAPER-II (NEW SCHEME) GROUP-II

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

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 bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) The electric potential at mid point in an electric dipole is:

(A) 0.5 V (B) 0 V (C) 1 V (D) 1.5 V

(2) Negative of potential gradient is equal to:

(A) Magnetic intensity (B) Electric flux (C) Electric intensity (D) Magnetic flux

(3) Drift velocity of electrons is of the order of:

(A) $10^3 \, kms^{-1}$ (B) $10^{-3} \, ms^{-1}$ (C) $10^3 \, ms^{-1}$ (D) $10^5 \, ms^{-1}$

(4) The SI unit of magnetic induction is:

(A) Weber (B) Gauss (C) Tesla (D) Nth

(5) A cross (×) represents the direction of magnetic field:

(A) Out of page (B) Tangent to page (C) Parallel to page (D) In to the page

(6) The only difference between the construction of A.C and D.C generator is:

(A) Carbon Brushes (B) Commutator (C) Coil (D) Magnetic field

(7) In three phase A.C supply, the coils are inclined at an angle of:

(A) 0° (B) 90° (C) 130° (D) 120°

(8) The SI unit of $\sqrt{LC}$ is:

(A) Second (B) Ampere (C) Hertz (D) Farad

(9) In extrinsic semiconductors, doping is of the order of:

(A) 1 atom to 10^4 (B) 1 atom to 10^8 (C) 1 atom to 10^6 (D) 1 atom to 10^3

(10) The operation of complementation is performed by:

(A) AND Gate (B) OR Gate (C) XOR Gate (D) NOT Gate

(11) In op-amp, the input resistance is of the order of:

(A) Several Mega Ohms (B) Several Kilo Ohms (C) Few Ohms (D) Hundred Ohms

(12) The factor $\dfrac{h}{m_0 c}$ has the dimensions of:

(A) Time (B) Mass (C) Length (D) Energy

(13) The value of Stefen's constant "σ" is given by: (A) $5.67 \times 10^{-8} Wm^{-2} K^{-2}$

(B) $5.67 \times 10^{-8} Wm^{-2} K^{-4}$ (C) $5.67 \times 10^8 Wm^2 K^2$ (D) $5.67 \times 10^{-8} W^2 m^2 K^{-2}$

(14) The typical nuclei have diameter less than:

(A) $10^{-14} m$ (B) $10^{-12} m$ (C) $10^{-10} m$ (D) $10^{-8} m$

(15) The particles which do not experience strong nuclear force are called:

(A) Hadrons (B) Baryons (C) Leptons (D) Mesons

(16) Iodine – 131 is used for the treatment of:

(A) Thyroid glands (B) Bones (C) Lungs (D) Eyes

(17) The term $\dfrac{\Delta \phi}{\Delta t}$ has the same units as:

(A) Time (B) Current (C) Electromotive force (D) Magnetic flux

INTERMEDIATE PART-II (12ᵗʰ CLASS)
PHYSICS PAPER-II (NEW SCHEME)   GROUP-II
TIME ALLOWED: 2.40 Hours   **SUBJECTIVE**   MAXIMUM MARKS: 68

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

SECTION-I

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

(i)   Write the names of main parts of xerography and draw its diagram.

(ii)   Define electric flux and write its formula. Also give its SI unit.

(iii)   Suppose that you follow an electric field line due to a positive point charge. Do electric field and the potential increase or decrease?

(iv)   Is $\vec{E}$ necessarily zero inside a charged rubber balloon if balloon is spherical? Assume that charge is distributed uniformly over the surface.

(v)   A solenoid 15 cm long has 300 turns of wire. A current of $5.0A$ flows through it. What is the magnitude of magnetic field inside the solenoid?

(vi)   Differentiate between sensitive and dead beat galvanometer. Also define sensitivity of galvanometer.

(vii)   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 the charge?

(viii)   A loop of wire is suspended between the poles of a magnet with its plane parallel to the pole faces. What happens if a direct current is put through the coil? What happens if an alternating current is used instead?

(ix)   Write any two methods in which the current is induced in a coil.

(x)   Why the motor is overloaded? Give the reason.

(xi)   When an electric motor, such as an electric drill, is being used, does it also act as a generator? If so what is the consequence of this?

(xii)   Can a D.C. motor be turned into a D.C generator? What changes are required to be done?

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

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

(ii)   What are the difficulties in testing whether the filament of a lighted bulb obey's Ohm's law?

(iii)   Write four sources of Current.

(iv)   What is meant by A.M and F.M.?

(v)   How many times per second will an incandescent lamp reach maximum brilliance when connected to a $50\,Hz$ source?

(vi)   What do you mean by root mean square value of voltage and write its formula?

(vii)   Distinguish between soft and hard magnetic materials with examples.

(viii)   Which is more elastic, steel or rubber? Why?

(ix)   Differentiate between ductile and brittle substances.

(x)   What is the net charge on a n-type or a p-type substance?

(xi)   What is the effect of forward and reverse biasing of a diode on the width of the depletion region?

(xii)   What is Potential Barrier? What is the value of potential barrier of Silicon and Germanium?

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

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

(ii)   We do not notice the de Broglie wavelength for a pitched cricket ball? Explain why?

(iii)   What are the measurements on which two observers in relative motion will always agree upon?

P.T.O

(iv)   Can X – rays be reflected, refracted, diffracted and polarized just like any other waves? Explain.

(v)   Explain why laser action can not occur without population inversion between atomic levels?

(vi)   What do you understand by "background radiation"? State two sources of this radiation.

(vii)   How can radioactivity help in the treatment of cancer?

(viii)   If someone accidentally swallows an α – source and a β – source which would be the more dangerous to him? Why?

(ix)   Define absorbed dose(D) and write its SI unit.

SECTION-II

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

5.(a)   What is Potentiometer? How it is used as potential divider and to measure an emf of a cell? $1 + 2 + 2$

(b)   A capacitor has a capacitance of $2.5 \times 10^{-8} F$. In the charging process, electrons are removed from one plate and placed on the other one. When the potential difference between the plates is $450V$, how many electrons have been transferred?

$(e = 1.6 \times 10^{-19} C)$ 3

6.(a)   Describe the method to determine the $e/_m$ of an electron.   5

(b)   A square coil of side 16 cm has 200 turns and rotates in a uniform magnetic field of magnitude $0.05T$. If the peak emf is $12V$. What is the angular velocity of the coil?   3

7.(a)   Explain the RLC parallel resonance circuit. Determine the value of resonant frequency and write down its properties. $1 + 2 + 2$

(b)   Calculate the gain of non-inverting amplifier shown in fig.   3
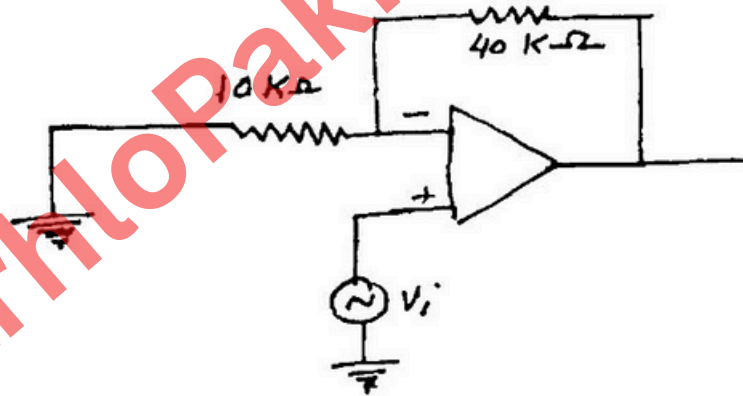
8.(a)   What is energy band theory? How behaviours of electrical conductors, insulators and semi-conductors can be explained on the basis of energy band theory.   5

(b)   A bar 1.0 m in length and located along x–axis moves with a speed of 0.75 c with respect to a stationary observer. What is the length of bar as measured by the stationary observer.   3

9.(a)   State Bohr's model of Hydrogen atom. Derive relation for quantized radii.   5

(b)   A sheet of lead 5.0 mm thick reduces the intensity of a beam of γ–rays by a factor 0.4. Find half value thickness of lead sheet which will reduce the intensity to half of its initial value.   3