Number: 4474 **INTERMEDIATE PART-II (12th CLASS)**

PHYSICS PAPER-II GROUP-II MTN-GII-21 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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) The SI unit of Impedance is:

(A) Henry (B) Hertz (C) Ohm (D) Volt

(2) Which one of the following is the example of crystalline solid?

(A) Plastic (B) Glass (C) Rubber (D) Zirconia

(3) Which component of the transistor has greater concentration of impurity?

(A) Base (B) Emitter (C) Collector (D) Resistor

(4) In full wave rectification, the numbers of diodes required is:

(A) 4 (B) 3 (C) 1 (D) 5

(5) Plank's constant 'h' has the same unit as that of:

(A) Angular momentum (B) Linear velocity (C) Torque (D) Power

(6) The factor $\frac{h}{m_0 c}$ has the dimension of:

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

(7) The radius of 10th orbit of hydrogen atom in nm is:

(A) 0.53 (B) 51.3 (C) 5.3 (D) 53

(8) The binding energy per nucleon is maximum for:

(A) Iron (B) Helium (C) Radium (D) Copper

(9) Which of the following is highly penetrating?

(A) α – particles (B) γ – rays (C) X – rays (D) β – particles

(10) The force on electron in an electric field of magnitude $10^4\ NC^{-1}$ is:

(A) $1.9 \times 10^{-15}\ N$ (B) $1.6 \times 10^{-15}\ N$ (C) $1.6 \times 10^{-8}\ N$ (D) $1.8 \times 10^{-15}\ N$

(11) The total electric flux through any closed surface depends upon:

(A) Charge (B) Medium (C) Geometry of closed surface (D) Both A and B

(12) Heat generated by a 50 watt bulb in one hour is:

(A) 36000 J (B) 48000 J (C) 1800 J (D) 180000 J

(13) One Tesla(T) is equal to:

(A) $1\,NA^{-1}$ (B) $1\,Nm^{-1}$ (C) $1NA^{-1}m$ (D) $1\,NA^{-1}m^{-1}$

(14) A 5 meter wire carrying a current of $2A$ is at right angle to uniform magnetic field of 0.5 Tesla. The force on the wire is:

(A) $5N$ (B) $4N$ (C) $2N$ (D) $1.5N$

(15) Lenz's law is in accordance with the law of conservation of:

(A) Mass (B) Momentum (C) Energy (D) Charge

(16) The emf induced in $1mH$ inductor in which current changes from $5A$ to $3A$ in $1ms$ is:

(A) $2 \times 10^{-6}V$ (B) $2V$ (C) $6 \times 10^{-6}V$ (D) $8V$

(17) Current leads the applied voltage in pure _____ circuit.

(A) Resistive (B) Capacitive (C) Inductive (D) Reactive

INTERMEDIATE PART-II (12th CLASS)

PHYSICS PAPER-II GROUP-II MTN-GI-21 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 × 2 = 16**

(i) How can you identify that which plate of capacitor is positively charged?

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

(iii) Define surface charge density. Also give its S.I unit.

(iv) Describe the change in the magnetic field inside a solenoid carrying a steady current I, if (a) length of solenoid is doubled but number of turns remains same and (b) the number of turns is doubled but length remains the same.

(v) What are dissimilarities between electric and gravitational forces?

(vi) Two charged particles are projected into a region where there is a magnetic field perpendicular to their velocities. If the charges are deflected in opposite directions, what can you say about them?

(vii) Write down the main parts of C.R.O.

(viii) Define magnetic induction, also define its unit.

(ix) How would you position a flat loop of wire in a changing magnetic field so that there is no *emf* induced in the loop?

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

(xi) Name the factors upon which self inductance depends?

(xii) Write down two methods for producing the induced *emf* in a loop.

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

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

(ii) Why does the resistance of a conductor rise with increase of temperature?

(iii) Write two uses of potentiometer.

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

(v) In a R–L circuit, will the current lag or lead the voltage? Illustrate your answer by a vector diagram.

(vi) What is the advantage of three phase A.C supply over single phase A.C?

(vii) Distinguish between crystalline, amorphous and polymeric solids.

(viii) What are superconductors? Write its two applications.

(ix) Why does doping not change the basic structure of the solid? Explain.

(x) Why does light emitting diodes emit visible light?

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

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

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

(i) Will bright light eject more electrons from a metal surface than dimmer light of the same colour?

(ii) Will higher frequency light eject greater number of electrons than low frequency light?

(iii) Write the name of any four applications of photocell.

P.T.O

(iv) Write any two uses of Laser in medicine and industry.

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

(vi) What is fission chain reaction?

(vii) For what purpose, bromine is mixed with principal gas in Geiger tube?

(viii) What information is revealed by the length and shape of the tracks of an incident particle in Wilson cloud chamber?

(ix) What factors make a fusion reaction difficult to achieve?

SECTION-II

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

5.(a) Compare the properties of electric and gravitational force. 5

(b) A platinum wire has resistance of 10Ω at 0^oC and 20Ω at 273^oC. Find the value of temperature co-efficient of resistance of platinum. 3

6.(a) Define mutual induction. Also derive an expression for induced *emf* in the secondary coil. 5

(b) A coil of $0.1m \times 0.1m$ and of 200 turns carrying a current of $1.0\,mA$ is placed in a uniform magnetic field of $0.1T$. Calculate the maximum torque that acts on the coil. 3

7.(a) What is operational amplifier. Derive the relation for the gain of non-inverting amplifier. 5

(b) Find the value of current flowing through a capacitance $0.5\,\mu F$. When connected to a source of $150V$ at $50Hz$ 3

8.(a) What is fusion reaction? Discuss in detail. What is the major source of heat and light in the Sun? 5

(b) What stress would cause a wire to increase in length by 0.01% if the Young's modulus of the wire is 12×10^{10} Pa? What force would produce this stress if the diameter of the wire is 0.56 *mm*? 3

9.(a) What is photoelectric effect? Explain it on the basis of quantum theory. 5

(b) Find the speed of the electron in the first Bohr's orbit. 3