Paper Code Number: 4472

2018 (A)

Roll No._____

**INTERMEDIATE PART-II (12th CLASS)**

**PHYSICS PAPER-II (NEW SCHEME) GROUP-II** MTN-G2-12-18

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 value of $\varepsilon_r$ for air is:-

(A) 1.6 (B) 1.06 (C) 1.006 (D) 1.0006

(2) In case of photocopier, a special dry, black powder called toner is given a:-

(A)Positive charge (B) Negative charge (C) Neutral (D) First positive then negative

(3) The potential difference between the head and tail of an electric eel can be up to:-

(A) 500 V (B) 600 V (C) 700 V (D) 800 V

(4) The current flowing towards the reader can be represented by a symbol:-

(A) Dot (B) Dash (C) Cross (D) Line

(5) The vector sum of the electric force and magnetic force is known as:-

(A) Maximum force (B) Lorentz force (C) Deflecting force (D) Newton's force

(6) The expression for energy density of solenoid is given as:-

(A) $\frac{B^2}{\mu_o}$ (B) $2\frac{B^2}{\mu_o}$ (C) $\frac{1}{2}\frac{B^2}{\mu_o}$ (D) $B^2\mu_o$

(7) A simple device that prevents the direction of current from changing is called:-

(A) Commutator (B) Rotor (C) Armature (D) Detector

(8) The unit of impedance is:-

(A) Volt (B) Ohm (C) Farad (D) Watt

(9) At resonance, the behaviour of R – L – C series circuit is:-

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

(10) Glass is also known as:-

(A) Solid (B) Liquid (C) Solid liquid (D) Gas

(11) The open loop gain of Op – Amp is of the order of:-

(A) $10^2$ (B) $10^3$ (C) $10^4$ (D) $10^5$

(12) The common emitter current amplification factor $\beta$ is given by:-

(A) $\frac{I_C}{I_E}$ (B) $\frac{I_C}{I_B}$ (C) $\frac{I_E}{I_B}$ (D) $\frac{I_B}{I_E}$

(13) The speed of earth around its orbit is:-

(A) $10\,km/s$ (B) $20\,km/s$ (C) $25\,km/s$ (D) $30\,km/s$

(14) The unit of Plank's constant "$h$" is:-

(A) $JC$ (B) $J/C$ (C) $JS$ (D) $J/S$

(15) In Helium – Neon Laser, the discharge tube is filled with:-

(A) 85 % of $He$ (B) 80 % of $He$ (C) 90 % of $He$ (D) 95 % of $He$

(16) The half-life of radon gas is:-

(A) 3.8 hours (B) 3.8 minutes (C) 3.8 days (D) 3.8 years

(17) The background radiation to which we are exposed, on the average is:-

(A) $1\,mSv$ per year (B) $2\,mSv$ per year (C) $3\,mSv$ per year (D) $4\,mSv$ per year

2018 (A) Roll No: _____

## INTERMEDIATE PART-II (12th CLASS)

**HYSICS PAPER-II (NEW SCHEME) GROUP-II** MTN-G2-12-18

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 a capacitor is negatively charged?

(ii) Electric lines of force never cross. Why?

(iii) Prove that $1eV = 1.6 \times 10^{-19} J$

(iv) Explain briefly the role of deflection plates in inkjet printers.

(v) Why does the picture on a T.V screen become distorted when a magnet is brought near it?

(vi) How can you use a magnetic field to separate isotopes of chemical element?

(vii) Explain briefly the working of electron gun in CRO.

(viii) Differentiate between magnetic flux and flux density.

(ix) Does the induced emf always act to decrease the magnetic flux through a circuit? Explain.

(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? Explain

(xi) A glass rod of length '$L$' is moving perpendicular to the applied magnetic field $B$ with velocity $V$. Explain briefly about the induced emf in it.

(xii) Define self inductance. Name any two factors upon which it depends.

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

(i) Is the filament resistance lower or higher in a 500 W, 220 V light bulb than in a 100W, 220 V bulb?

(ii) What is Wheatstone bridge? How can it be used to determine an unknown resistance?

(iii) What is Thermistor? Write its two uses.

(iv) What is the principle of Metal Detector? Write two uses of metal detector.

(v) How can you establish the formula for power in A.C circuits? Explain the role of power factor in it.

(vi) How does doubling of frequency affect the reactance of (a) An inductor (b) A capacitor?

(vii) Define Polymerization Reaction. Write two examples of Polymeric solids.

(viii) Define Brittle and Ductile Substances. Give two examples in each case.

(ix) Why is it impossible to have an isolated north or south pole of magnet? Explain.

(x) What is the role of potential barrier in a diode? How is it formed in a diode?

(xi) Describe by a circuit diagram, how current flows in a n – p – n transistor?

(xii) How is the XOR gate so called? Draw its symbol.

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

(i) Differentiate between Photoelectric Effect and Compton Effect.

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

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

(iv) Write any two Postulates of Bohr's model of the Hydrogen atom.

(v) What do we mean when we say that the atom [illegible]

(vi) A particle which produces more ionization is less penetrating. Explain.

(vii) Why are heavy Nuclei Unstable? Explain.

(viii) What is meant by Absorbed Dose? Write its unit.

(ix) Define Hadrons and Leptons.

## SECTION-II

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

5.(a) Define Resistivity. How does it depend upon temperature? Also define temperature coefficient of resistance. 1 + 3 + 1 = 5

(b) Determine the electric field at the position $\vec{r} = (4\hat{i} + 3\hat{j})\ m$ caused by a point charge $q = 5.0 \times 10^{-6}\ C$ placed at origin. 3

6.(a) Derive the relation for energy stored in an inductor. 5

(b) A power line 10.0 m high carries a current 200 A. Find the magnetic field of the wire at the ground. 3

7.(a) What is Transistor? Describe the use of transistor as an amplifier. Also calculate its voltage gain. 1+2+2

(b) What is the resonant frequency of a circuit which includes a coil of inductance $2.5\ H$ and a capacitance of $40\mu F$? 3

8.(a) Define Positron. How Davison and Germer experiment confirms the wave nature of particles? 1+4

(b) A 1.25 cm diameter cylinder is subjected to a load of 2500 Kg. Calculate the stress on the bar in mega pascals. 3

9.(a) Define Spontaneous and Stimulated emissions. Explain the Laser action in detail. 1+1+3

(b) A 75 kg person receives a whole body radiation dose of 24 m – rad, delivered by $\alpha$ – particles for which RBE factor is 12. Calculate (a) The absorbed energy in Joules and (b) The equivalent dose in rem. 3