

INTERMEDIATE PART-II (12th CLASS)**PHYSICS PAPER-II (OLD SCHEME)**

TIME ALLOWED: 2.40 Hours

GROUP-II**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) Do electrons tend to go to the region of high potential or of low potential?
- (ii) Electric lines of force never cross, why?
- (iii) How can you identify that which plate of the capacitor is positively charged?
- (iv) Prove that RC has same unit as of time.
- (v) Why the voltmeter should have very high resistance?
- (vi) What is Dead Beat Galvanometer?
- (vii) How can a current loop be used to determine the presence of a magnetic field in a given region of space?
- (viii) What is Lorentz Force?
- (ix) A suspended magnet is oscillating freely in a horizontal plane. The oscillations are strongly damped when a metal plate is placed under the magnet. Explain why this occurs?
- (x) Can an electric motor be used to drive an electric generator with the output from the generator being used to operate the motor?
- (xi) What is back emf effect in motor?
- (xii) Define the Unit Henry.

3. Attempt any eight parts.

8 × 2 = 16

- (i) Do bends in a wire affect its electrical resistance? Explain.
- (ii) What is Potentiometer? Write its two uses.
- (iii) What are the difficulties in testing whether the filament of a lighted bulb obeys Ohm's Law?
- (iv) How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50 Hz source?
- (v) How does doubling the frequency affect the reactance of (a) An inductor (b) A capacitor?
- (vi) What is "Choke"? Write its advantage over Rheostat.
- (vii) Define Superconductor. Write its two applications.
- (viii) What is meant by Hysteresis loss? How is it used in the construction of a transformer?
- (ix) What are Paramagnetic and Ferromagnetic substances? Give one example of each.
- (x) Photo diode is operated in reverse biased state, Why?
- (xi) What is the net charge on a n -type or a p -type substance?
- (xii) Write briefly about Photo-Voltaic Cell.

4. Attempt any six parts.

6 × 2 = 12

- (i) Which has the lower energy quanta? Radiowaves or X -rays.
- (ii) Why don't we observe a Compton effect with visible light?
- (iii) What is a Photocell? Write its at least two applications.
- (iv) How can the Spectrum of Hydrogen contain so many lines when Hydrogen contains one electron?

- (v) What do we mean when we say that the atom is excited?
- (vi) What fraction of a radioactive sample decays after two half-lives have elapsed?
- (vii) Discuss the advantages and disadvantages of Nuclear Power, compared to the use of fossil fuel generated power.
- (viii) What are Isotopes? What do they have common and what are their differences?
- (ix) What is meant by Mass Defect and Binding Energy?

SECTION-II

NOTE: - Attempt any three questions.

- 5.(a) What is Wheatstone Bridge? Explain and prove the Principle of Wheatstone Bridge. How can it be used to find the unknown resistance of a wire? 5
- (b) A point charge $q = -8.0 \times 10^{-8} C$ is placed at the origin. Calculate electric field at a point 2.0m from the origin on the $z -$ axis. 3
- 6.(a) State Ampere's Law and apply this law to find magnetic field due to a current carrying Solenoid. 5
- (b) The back emf in a motor is 120V when the motor is turning at 1680 rev. per min. What is the back emf when the motor turns 3360 rev. per min? 3
- 7.(a) Describe R – L – C series circuit and derive the relation for resonance frequency. 5
- (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
- 8.(a) Briefly discuss "Transistor as an Amplifier". Find its gain. 5
- (b) An electron is placed in a box about the size of an atom that is about $1 \times 10^{-10} m$. What is the velocity of the electron? 3
- 9.(a) Define Laser. Explain construction, working principle of He – Ne Laser. 5
- (b) The half-life of ${}_{38}^{91}Sr$ is 9.70 hrs. Find its decay constant. 3