2015 (A) Roll No: _____

INTERMEDIATE PART-II (12th CLASS)

PHYSICS PAPER-II (OLD SCHEME) TIME ALLOWED: 2.40 Hours

GROUP-I **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) If a point charge q of mass m is released in a non-uniform electric field, will it make a rectilinear motion?

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

(iii) Verify that an Ohm times farad is equivalent to second.

(iv) A spherical shell encloses an electric dipole. What is the electric flux through the surface of shell?

(v) How can a current loop be used to determine the presence of a magnetic field in a given region of space?

(vi) What should be the orientation of a current carrying coil in a magnetic field so that torque acting upon the coil is: (a) maximum (b) minimum

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

(b) the number of turns is doubled, but the length remainsthe same.

(viii) Differentiate between Permitivity and Permeability.

(ix) 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.

(x) In a transformer, there is no transfer of charge from the primary to the secondary coil. How is, then the power transferred?

(xi) State Faraday's Law of Electro-magnetic Induction. Write its mathematical form.

(xii) On which factors the mutual inductance of two coils depends?

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

(i) Why does resistance of conductor rise with temperature?

(ii) Do bend in a wire affect its electrical resistance?

(iii) Define specific resistance, also give its units.

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

(v) Discuss the Principle of Choke.

(vi) How can power loss be minimized in a transformer due to eddy currents?

(vii) What is meant by Para and Diamagnetic Substances?

(viii) What is meant by Ductile and Brittle Substances?

(ix) Write short note on Super Conductor.

(x) Draw the circuit diagram of Half and Full wave rectification.

(xi) Discuss only two characteristics of op-amp.

(xii) Give Mathematical Notation for NOR operation. Also give its Truth Table.

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

(i) Is it possible to create a single electron from energy? Explain.

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

(iii) What is relativistic Kinetic Energy?

(iv) How can the spectrum of Hydrogen contain so many lines when Hydrogen contains one electron?

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(v) What are the advantages of Laser over ordinary light?

(vi) Why must a GM tube for detecting α – particles have a very thin end window? Why does a GM counter for detecting γ – rays does not need a window at all?

(vii) Describe the principle of operation of a solid state detector of ionizing radiation in terms of generation and detection of charge carriers.

(viii) Discuss the advantages and disadvantages of nuclear power compared to the use of fossil fuel generated power.

(ix) What are the uses of nuclear radiation in medical diagnostics and treatment?

SECTION-II

NOTE: - Attempt any three questions.

5.(a) Find out the capacity of a parallel plate capacitor and hence define Dielectric Constant. 5

(b) How many electrons pass through an electric bulb in one minute, if 300 mA current is passed through it. 3

6.(a) State and derive Faraday's Law of Electromagnetic Induction. 5

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

7.(a) What is an impedance? Derive the relation for impedance in case of R – C series circuit. 5

(b) A 1.0m long Copper wire is subjected to stretching force and its length increases by 20 cm. Calculate the tensile strain and the percent elongation which the wire undergoes. 3

8.(a) What is meant by Rectification? Explain the action of a semiconductor diode as a full wave rectifier. 5

(b) X – rays of wavelength 22 pm are scattered from a Carbon target. The scattered radiation being viewed at 85^o to the incident beam. What is the Compton Shift? 3

9.(a) What are X – rays? How are X – rays produced? Explain the production of (i) characteristics X – rays (ii) continuous X – rays 5

(b) How much energy is absorbed by a man of mass 80 kg who receives a lethal whole body equivalent dose of 400 rem, in the form of low energy neutrons for which RBE factor is 10? 3