



Roll No.

Answer Sheet No. _____

Sig. of Candidate. _____

Sig. of Invigilator. _____

PHYSICS HSSC-II

SECTION – A (Marks 17)

Time allowed: 25 Minutes

NOTE:- Section-A is compulsory and comprises pages 1-2. All parts of this section are to be answered on the question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

- (i) What is S.I unit of electric flux?
 A. NmC^{-1} B. $Nm^{-1}C^{-1}$
 C. Nm^2C^{-1} D. Nm^2C^{-2}
- (ii) What is the quantity $\frac{\Delta V}{\Delta r}$ called?
 A. Electric potential B. Electric energy
 C. Potential barrier D. Potential gradient
- (iii) In carbon resistors, what is the value of violet colour?
 A. 6 B. 7
 C. 8 D. 9
- (iv) Which equation represents the maximum output power?
 A. $P = \frac{E^2}{4R}$ B. $P = \frac{E^2}{4r}$
 C. $P = \frac{E^2}{4R^2}$ D. $P = \frac{E^2}{4r^2}$
- (v) What is the unit of magnetic flux?
 A. $Nm^{-1}A^{-1}$ B. NmA^{-1}
 C. $Nm^{-1}A$ D. $Wb.m^{-2}$
- (vi) On what principle does a transformer work?
 A. Electrostatic induction B. Electromagnetism
 C. Ohm's law D. Mutual induction
- (vii) "Eddy Currents" are set up in a direction _____
 A. Parallel to the flux B. Anti parallel to the flux
 C. At an angle of 45° to the flux D. Perpendicular to the flux
- (viii) The r.m.s value of current is given by _____
 A. $\frac{I_0}{\sqrt{2}}$ B. $\sqrt{2} I_0$
 C. $2\sqrt{2} I_0$ D. $\frac{I_0}{2\sqrt{2}}$
- (ix) At what frequency will an inductor of 1.0 H have a reactance of 500Ω ?
 A. 50 Hz B. 80 Hz
 C. 500 Hz D. 1000 Hz

DO NOT WRITE ANYTHING HERE

- (x) What are the substances called which undergo plastic deformation until they break?
 A. Brittle substances B. Ductile substances
 C. Amorphous solids D. Polymeric solids
- (xi) The common emitter current amplification factor β is given by _____
 A. $\frac{I_C}{I_E}$ B. $\frac{I_C}{I_B}$
 C. $\frac{I_E}{I_B}$ D. $\frac{I_B}{I_E}$
- (xii) In which type of logic gate, the out put is one when both inputs are zero?
 A. OR gate B. AND gate
 C. NOT gate D. NOR gate
- (xiii) $1u =$ _____ Mev
 A. 1.6×10^{-19} B. 3.36
 C. 1.66×10^{-27} D. 931
- (xiv) At what speed would the mass of an electron become double of its rest mass?
 A. 0.5C B. 0.707C
 C. 0.866C D. 0.99C
- (xv) In which region of electromagnetic spectrum of Hydrogen, the balmer series lies?
 A. Infrared B. Visible
 C. Ultraviolet D. Farultraviolet
- (xvi) The half-life of ${}^{91}_{38}\text{Sr}$ is 9.70 hours. What is its decay constant?
 A. $1.98 \times 10^{-5} \text{S}^{-1}$ B. $1.6 \times 10^{-4} \text{S}^{-1}$
 C. $2.5 \times 10^{-5} \text{S}^{-1}$ D. None of these
- (xvii) Leptons are particles that do not experience _____.
 A. Weak nuclear force B. Strong nuclear force
 C. Electric force D. Magnetic force

For Examiner's use only:

Total Marks:

17

Marks Obtained:

-----2HA 1108 (L) -----

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

NOTE:- Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

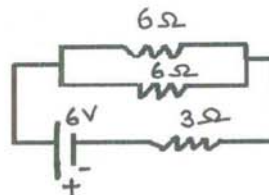
Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 3 to 4 lines. (14 x 3 = 42)

- (i) Compare Electric and Gravitational forces.
- (ii) Prove that the electric intensity at any point inside a hollow charged sphere is zero.
- (iii) What are the difficulties in testing whether the filament of a lighted bulb obeys ohm's law?
- (iv) Describe briefly, how Potentiometer is used to compare the e.m.fs of two cells.
- (v) Give three uses of Cathode Ray Oscilloscope(CRO).
- (vi) By using formula, 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 remains the same and (b) the number of turns is doubled but the length remains the same.
- (vii) Does the induced e.m.f in a circuit depend on the resistance of the circuit? Does the induced current depend on the resistance of the circuit?
- (viii) When the primary of a transformer is connected to A.C mains the current in it (a) is very small if the secondary circuit is open but (b) increases when the secondary circuit is closed. Explain these facts.
- (ix) What are Electrical oscillators? How do they play their part in metal detectors?
- (x) Compare F.M and A.M radio waves.
- (xi) What are Superconductors? Why are they preferred? Give names of the two devices where super-conductors are applied.
- (xii) What is meant by Hysteresis loss? How is it used in construction of a transformer?
- (xiii) What is Photodiode? Why is it operated in reverse biased state?
- (xiv) We often see that during day time when it is cloudy, street lights turn ON, automatically. Why does it so happen?
- (xv) How have the results of special theory of relativity been applied to NAVSTAR navigation system?
- (xvi) Photon A has twice the energy of photon B. What is the ratio of the momentum of A to that of B?
- (xvii) How can the spectrum of hydrogen contain so many lines when hydrogen contains one electron?
- (xviii) What factors make a fusion reaction difficult to achieve?
- (xix) What do you understand by "background radiation"? State two sources of this radiation.

SECTION – C (Marks 26)

Note:- Attempt any TWO questions. (2 x 13 = 26)

- Q. 3 a. What is Capacitor and its Capacitance? Discuss the factors upon which capacitance of a capacitor depends. Obtain the expression for dielectric constant. 1+1+6
- b. Find equivalent resistance of the circuit, total current drawn from the source and the current through each resistor. 05



- Q. 4 a. What is Current generator? Give the principle and construction of an A.C generator. Derive formula to calculate the e.m.f induced in the loop. 08
- b. A circuit consists of a capacitor of $2\mu F$ and a resistance of 1000Ω connected in series. An alternating voltage of 12volts and frequency $50Hz$ is applied. Find : 04
- (i) The current in the circuit
 - (ii) The average power supplied
- c. How many times per second will an incandescent lamp reach maximum brilliance when connected to a $50Hz$ source? 01
- Q. 5 a. How are the X-rays produced? Explain the production of: 08
- (i) Characteristic X-ray
 - (ii) Continuous X-ray
- b. What is the de-Broglie wavelength of an electron whose kinetic energy is $120 eV$? 04
- c. What does LASER stand for? 01