Total No. of Questions – 21 Regd.
Total No. of Printed Pages – 2 No.

Part – III
PHYSICS, Paper-II
(English Version)

Time : 3 Hours] [Max. Marks : 60

SECTION – A $10 \times 2 = 20$

Note : (i) Answer all questions.

(ii) Each question carries two marks.

(iii) All are very short answer type questions.

1. Define power of a convex lens. What is it's unit ?

2. Distinguish between ammeter and voltmeter.

3. Define magnetic inclination or angle of dip.

4. The earth's magnetic field at the equator is approximately 4×10^{-5} T. Estimate the earth's dipole moment. (Radius of the earth = 6.4×10^{6} m)

5. What is the phenomenon involved in the working of a transformer ?

6. Give two uses of Infrared rays.

7. What is the de Broglie wavelength associated with an electron accelerated through a potential difference of 100 volts ?

8. Give examples of 'Photo Sensitive Substances'. Why are they called so ?

9. Draw the circuit symbols for P–N–P and N–P–N transistors.

10. Mention basic methods of modulation.

Note : **(i)** **Answer any six questions.**

(ii) **Each question carries four marks.**

(iii) **All are short answer type questions.**

11. Define critical angle. Explain total internal reflection using a neat diagram.

12. Does the principle of conservation of energy hold for interference and diffraction phenomena ? Explain briefly.

13. Derive an expression for the intensity of the electric field at a point on the equatorial plane of an electric dipole.

14. Explain parallel combination of capacitors. Derive the formula for equivalent capacitance in parallel combination of capacitors.

15. A current of 10 A passes through two very long conducting wires held parallel to each other and separated by a distance of 1 m. What is the force per unit length between them ?

16. Obtain an expression for the emf induced across a conductor which is moved in a uniform magnetic field which is perpendicular to the plane of motion.

17. State the basic postulates of Bohr's theory of atomic spectra.

18. Define NAND and NOR gates. Give their truth tables.

<div align="center">SECTION – C 2 × 8 = 16</div>

Note : **(i)** **Answer any two questions.**

(ii) **Each question carries eight marks.**

(iii) **All are long answer type questions.**

19. Explain the formation of stationary waves in stretched strings and hence deduce the laws of transverse waves in stretched strings.

20. (a) State the working principle of potentiometer. Explain with the help of circuit diagram how potentiometer is used to determine the internal resistance of the given primary cell.

    (b) In a potentiometer arrangement, the balance point with the cell is 76.3 cm. When a resistor 9.5 Ω is used in the external circuit of the cell the balance point shifts to 64.8 cm. Determine the internal resistance of the cell.

21. (a) Explain the principle and working of a nuclear reactor with the help of a labelled diagram.

    (b) If one microgram $_{92}U^{235}$ is completely destroyed in an atom bomb, how much energy will be released ?