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Part III

PHYSICS

Paper II

(English Version)

Time : 3 Hours   **Max. Marks : 60**

SECTION A   10×2=20

Note :— (i)   Answer ALL questions.

(ii)   Each question carries TWO marks.

(iii)   ALL are very short answer type questions.

1. What is the importance of Oersted's experiment ?

2. The earth takes 24 hours to rotate once about its axis. How much time does the sun take to shift by 1° when viewed from the earth ?

3. A short bar magnet placed with its axis at 30° with an external field of 800×10^{-4} T experiences a torque of 0.016 Nm. What is the magnetic moment of the magnet ?

4. Define magnetic declination.

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

6. Give *two* uses of infrared rays.

7. What is "Photoelectric effect" ?

8. What are "Cathode rays" ?

9. What are intrinsic and extrinsic semiconductors ?

10. Which type of communication is employed in mobile phones ?

SECTION B   6×4=24

Note :— (i)   Answer any SIX of the following questions.

(ii)   Each question carries FOUR marks.

(iii)   ALL are short answer type questions.

11. Define focal length of a concave mirror. Prove that the radius of curvature of a concave mirror is double its focal length.

12. Explain Doppler effect in light. Distinguish between red shift and blue shift.

13. State and explain Coulomb's inverse square law in electricity.

14. A 900×10^{-12} F capacitor is charged by 100 V battery. How much electrostatic energy is stored by the capacitor ?

15. Describe the ways in which Eddy currents are used to advantage.

16. How do you convert a moving coil galvanometer into an ammeter and a voltmeter ? Explain with diagrams.

17. Explain the different types of spectral series.

18. Distinguish between half-wave and full-wave rectifiers.

SECTION C $2 \times 8 = 16$

Note :— (i)   Answer any TWO of the following questions.

　　　　(ii)   Each question carries EIGHT marks.

　　　　(iii) ALL are long answer type questions.

19. (a) Explain the formation of stationary waves in stretched strings and derive harmonic equations.

　　(b) A stretched wire of length 0.6 m is observed to vibrate with a frequency of 30 Hz in the fundamental mode. Find the velocity of propagation of transverse waves in the string.

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

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