

Part-III
PHYSICS
Paper – II
(English Version)

Time : 3 Hours

Max. Marks : 60

SECTION – A

(10x2=20)

Note : (i) Answer ALL questions.

(ii) Each question carries TWO marks.

(iii) ALL are very short answer type questions.

1. What is dispersion ? Which colour gets relatively more dispersed ?
2. A circular coil of radius r having N turns carries a current i . What is its magnetic moment ?
3. Define magnetic inclination or angle of dip.
4. What do you understand by the 'magnetization' of a sample ?
5. A transformer converts 200 V ac into 2000 V ac. Calculate the number of turns in the secondary if the primary has 10 turns.
6. If the wavelength of electromagnetic radiation is doubled, what happens to the energy of photon ?
7. Calculate the de Broglie wavelength of a ball of mass 0.12 kg moving with a speed of 20 m/s.
8. State Heisenberg's uncertainty principle
9. What are intrinsic and extrinsic semi conductors ?
10. What are the basic block of a communication system ?

SECTION –B

(6x4=24)

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 holds for interference and diffraction phenomena ? Explain briefly.
13. Derive the equation for the couple acting on a electric dipole in a uniform electric field.
14. Explain the behaviour of dielectrics in an external field.

15. Derive an expression for the magnetic dipole moment of a revolving electron.
16. What are Eddy currents ? Describe the ways in which Eddy currents are used to the advantage.
17. Explain the different types of spectral series of hydrogen spectra.
18. Define NAND and NOR gates. Give their truth tables.

SECTION –C

(2x8=16)

Note : (i) Answer ANY TWO questions.

(ii) Each question carries EIGHT marks.

(iii) ALL are long answer type questions.

19. How are stationary waves formed in closed pipes ? Explain the various modes of vibrations and obtain relations for their frequencies. A closed organ pipe 70 cm long is sounded. If the velocity of sound is 331 m/s. What is the fundamental frequency of vibration of air column?

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. A potentiometer wire of 5 m long and a potential difference of 6 V is maintained between its ends. Find the emf of a cell which balances against a length of 180 cm of the potentiometer wire.

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

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