219

II

Total No. of Questions : **21**
Total No. of Printed Pages : **2**

Regd. No.

Part - III
PHYSICS - PAPER - II
(English Version)

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

Note : *Read the following instructions carefully.*

(i) Answer all the questions of Section-A. Answer any six questions in Section-B and answer any two questions in Section-C.

(ii) In Section-A, questions from Sr. Nos. 1 to 10 are Very Short Answer Type. Each question carries two marks. Answer all questions at one place in the same order.

(iii) In Section-B, questions from Sr. Nos. 11 to 18 are of Short Answer Type. Each question carries four marks.

(iv) In Section-C, questions from Sr. Nos. 19 to 21 are of Long Answer Type. Each question carries eight marks.

SECTION - A

Note : Answer *all* questions. **10x2=20**

1. What is dispersion ? Which colour gets relatively more dispersed ?

2. State Ampere's Law and Biot-Savart Law.

3. What happens to compass needles at the Earth's poles ?

4. The horizontal component of the earth's magnetic field at a certain place is 2.6×10^{-5} T and the angle of dip is 60°. What is the magnetic field of the earth at this location ?

5. Obtain the resonant frequency ω_r of a series LCR circuit with L = 2.0 H, C = 32 μF and R = 10 Ω.

6. What is the principle of production of electromagnetic waves ?

7. State Heisenberg's Uncertainty Principle.

8. The work function of Caesium is 2.14 eV. Find the Threshold frequency for Caesium.

9. Write the truth table of NAND gate. How does it differ from AND gate ?

10. Define modulation. Why is it necessary ?

SECTION - B

Note : Answer *any six* questions. **6x4=24**

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

12. How do you determine the resolving power of your eye ?

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

14. Derive an expression for the capacitance of a parallel plate capacitor.

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

16. Current in a circuit falls from 5.0 A to 0.0 A in 0.1 s. If an average emf of 200 V induced, give an estimate of the self inductance of the circuit.

17. What are the limitations of Bohr's theory of hydrogen atom ?

18. What is rectification ? Explain the working of a full wave rectifier.

SECTION - C

Note : Answer *any two* questions. **2x8=16**

19. What is Doppler Shift ? Obtain an expression for the apparent frequency of sound heard when the observer is in motion with respect to a source at rest.

20. (a) State Kirchoff's Law for an electrical network. Using these laws deduce the condition for balance in a Wheatstone Bridge.

(b) A battery of emf 10 V and internal resistance 3 Ω is connected to a resistor : If the current in the circuit is 0.5 A, what is the resistance of the resistor ?

21. (a) What is radioactivity ? State the law of radioactive decay. Show that radioactive decay is exponential in nature.

(b) Compare the radii of the nuclei of mass numbers 27 and 64.

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