

219  
(TS)

A

Total No. of Questions - 21

Total No. of Printed Pages - 2

Regd.  
No.

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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 myopia? How can it be corrected?
2. Classify the following materials with regard to magnetism :  
Manganese, Cobalt, Bismuth, Copper.
3. Define magnetic inclination or angle of dip.
4. How do you convert a moving coil galvanometer into a voltmeter?
5. What is the phase difference between A.C e.m.f. and current in the following?  
Pure resistor and pure inductor.
6. What are the applications of microwaves?
7. What is work function?
8. An electron, an  $\alpha$  particle and a proton have the same kinetic energy. Which of these particles has the shortest de Broglie wavelength?
9. Which gates are called universal gates?
10. What is modulation? Mention the basic methods of modulation.

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 critical angle. Explain total internal reflection using a neat diagram.
12. Derive the expression for the intensity at a point where interference of light occurs. Arrive at the conditions for maximum and zero intensity.
13. State Gauss's law in electrostatics. Explain its importance.
14. Derive the formula for equivalent capacitance when the capacitors are connected in series.
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. Describe the ways in which Eddy currents are used to advantage.
17. What is rectification? Explain the working of a full wave rectifier.
18. Derive an expression for potential and kinetic energy of an electron in any orbit of a hydrogen atom according to Bohr's atomic model.

SECTION C

2 × 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. How are stationary waves formed in closed pipes? Explain the various modes of vibrations and obtain relations for their frequencies. A pipe 30 cm long is open at both ends. Find the fundamental frequency. Velocity of sound in air is  $330 \text{ ms}^{-1}$ .

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

A battery of emf 10 V and internal resistance  $3 \Omega$  is connected to a resistor  $R$ . If the current in the circuit is 0.5 A, calculate the value of  $R$ .

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