

0219**C**

Total No. of Questions - 33

Total No. of Printed Pages - 3

Regd.

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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 **ANY TEN** 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. Define 'Power' of a convex lens. What is its unit?
3. How do you convert a moving coil galvanometer into an ammeter?
4. Magnetic lines form continuous closed loops. Why?
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. Microwaves are used in Radars, why?
7. Write down deBroglie's relation and explain the terms therein.
8. What is an n-type semiconductor? What are the majority and minority charge carriers in it?
9. Define modulation. Why is it necessary?
10. What are the basic blocks of a communication system?
11. What is myopia? How can it be corrected?
12. Distinguish between ammeter and voltmeter.
13. Define magnetic declination.

14. Give two uses of infrared rays.
15. What is "work function" ?

SECTION - B

6 × 4 = 24

- Note:**
- (i) Answer **ANY SIX** questions.
 - (ii) Each question carries **FOUR** marks.
 - (iii) All are of short answer type questions.

16. Define critical angle. Explain total internal reflection using a neat diagram.
17. Explain the formation of mirage.
18. Explain Doppler effect in light. Distinguish between red shift and blue shift.
19. State and explain Coulomb's inverse square law in electricity.
20. Derive the equation for the couple acting on a electric dipole in a uniform electric field.
21. Define intensity of electric field at a point. Derive an expression for the intensity due to a point charge.
22. Derive an expression for the electric potential due to a point charge.
23. Derive an expression for the capacitance of a parallel plate capacitor.
24. Derive the formula for equivalent capacitance in series combination.
25. State and explain Biot-Savart law.
26. Describe the ways in which Eddy currents are used to advantage.
27. Explain the different types of spectral series.
28. What are the limitations of Bohr's theory of hydrogen atom?
29. Describe how a semi conductor diode is used as a half wave rectifier

- Note:**
- (i) Answer any **ANY TWO** questions.
 - (ii) Each question carries **EIGHT** marks.
 - (iii) All are long answer type questions.

30. Explain the formation of stationary waves in an air column enclosed in open pipe. Derive the equations for the frequencies of the harmonics produced.
31. State Kirchhoff's laws for an electrical network. Using these laws deduce the condition for balance in a Wheatstone bridge.
32. Explain the principle and working of a nuclear reactor with the help of a labeled diagram.
- Calculate the energy equivalent of 1 g of substance.
33. 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 the air column?