

219**TS****A**

Total No. of Questions – 21

Total No. of Printed Pages - 02

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 **all** questions.
(ii) Each question carries **two** marks.
(iii) **All** are very short answer type questions.

1. Define power of a convex lens. What is its unit ?
2. What are the units of magnetic moments and magnetic induction ?
3. Classify the following materials with regard to magnetism :
Manganese, Cobalt, Nickel, Bismuth, Oxygen and Copper
4. How do you convert a moving coil galvanometer into a voltmeter ?
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. Write down de Broglie's relation and explain the terms therein.
8. What is Photoelectric effect ?
9. Draw the circuit symbols for p-n-p and n-p-n transistors.
10. What is modulation ? Why is it necessary ?

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. With a neat labelled diagram, explain the formation of image in a simple microscope.
12. Explain Doppler effect in light. Distinguish between Red shift and Blue shift.
13. Derive an expression for the intensity of the electric field at a point on the axial line of an electric dipole.

14. Derive an expression for the electric potential due to a point charge.
15. State and explain Biot-Savart Law.
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. Explain the different types of spectral series in a hydrogen atom.
18. Describe how a semiconductor diode is used as a half-wave rectifier.

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. Explain the formation of stationary waves in an air column enclosed in open pipe. Derive the equations for the frequencies of the harmonics produced.
 A open organ pipe 85 cm long is sounded. If the velocity of sound is 340 m/s, what is the fundamental frequency of vibration of the air column ?
20. State Kirchhoff's law for an electrical network. Using these laws deduce the condition for balance in a Wheatstone bridge.
 A wire of resistance $4R$ is bent in the form of a circle. What is the effective resistance between the ends of the diameter ?
21. What is radioactivity ? State the law of radioactive decay. Show that radioactive decay is exponential in nature.
 The half life of radium is 1600 years. How much time does 1 g of radium take to reduce to 0.125 g ?