

SECTION – A

[10X2=20M]

NOTE: (i) Answer all questions.

(ii) Each question carries two marks.

(iii) All are very short answer type questions.

1. The focal length of a concave lens is 30 cm. where should an object be placed so that its image is $\frac{1}{10}$ of its size?
2. Why is the electric field always at right angles to the equipotential surface? Explain.
3. Under what conditions is the current through the mixed grouping of cells maximum?
4. State Ampere's law and Biot Savart's law.
5. Current in a circuit falls from 5.0 A to 0.0 A in 0.1 s. If an average emf of 200 V is induced, give an estimate of the self-inductance of the circuit.
6. How is impact parameter related to angle of scattering?
7. Define Becquerel and curie.
8. Microwaves are used in Radar's. why?
9. Write the truth table of NAND gate. How does it differ from AND gate?
10. Define modulation. why is it necessary?

SECTION – B

[6X4=24M]

NOTE: (i) Answer any six of the following questions.

(ii) Each question carries four marks.

(iii) All are short answer type questions.

11. Explain the formation of a Rainbow.
12. State Gauss's law in electrostatics. Explain its importance.
13. Derive the expression for the capacitance of a parallel plate capacitor.
14. A wire of resistance $4R$ is bent in the form of a circle. What is the effective resistance between the ends of the diameter?
15. Describe the ways in which Eddy Currents are used to advantage.
16. What is photo electric effect? How did Einstein's Photo electric equation explain the effects of intensity (of light) and potential on photo- electric current?
17. Write short note on the discovery of neutron.
18. What is rectification? Explain the working of full wave rectifier.

SECTION – C

[2X8=16M]

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 air column enclosed in an open pipe. Derive the equations for the frequencies of harmonics produced.
20. Describe the construction and working of moving coil galvanometer obtain an expression for the torque on a loop placed in a uniform magnetic field. A coil of 20 turns has an area of 800mm^2 and carries a current of 0.5A . If it is placed in a magnetic field of 0.3T with its plane parallel to the field, what is the torque it experiences?

21. State the basic postulates of Bohr's theory of atomic spectra. Hence obtain an expression for the radius of orbit and the energy of orbital electrons in a hydrogen atom.