BOARD OF INTERMEDIATE EDUCATION

SENIOR INTER PHYSICS

MODEL PAPER

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

SECTION - A

I. **i) Very short answer type questions.**

ii) Answer ALL questions.

iii) Each question carries TWO marks. **$10 \times 2 = 20$**

1. Define the power of a convex lens. Write its SI units.

2. A circular coil of N turns, radius r and having current I. What is the magnetic moment of the coil?

3. What did you understand about magnetisation of a given sample?

4. What is Curie temperature?

5. A transformer of primary coil turns 10 will be able to convert 200 V ac to 2000 V ac. Find the number of turns in secondary coil.

6. What is the relation between the amplitudes of electric and magnetic fields of an electromagnetic waves in free space?

7. What is photo electric effect? Write the Einstein's photo electric equation.

8. Three particles an electron, α - particle and proton are having same kinetic energy. Which among them is having least de Broglie wavelength?

9. Draw the circuit symbols of p-n-p and n-p-n transistors.

10. What is modulation? What is the importance of modulation?

SECTION - B

II. **i) Short answer type questions.**

ii) Answer any SIX questions.

iii) Each question carries FOUR marks. **$6 \times 4 = 24$**

11. Define critical angle. With the help of a neat diagram explain the total internal reflection.

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

13. Consider an electric field $\vec{E} = 3 \times 10^3 \hat{i}$ N/C. Find the electric flux

a) Through a square plane of side 10 cm and is parallel to YZ - plane.

b) The normal drawn to the square plane is making 60° with the X - axis.

14. Derive an expression for the potential energy of electric dipole placed in an uniform electric field.

15. What are the basic components of a cyclotron? Write the uses of cyclotron.

16. Deduce an expression for magnetic energy stored in a solenoid.

17. If the wavelength of first member of Lyman series is 1216 A°. What is the wavelength of second member of Balmer series?

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

SECTION - C

III. i) Long answer type questions.

ii) Answer any TWO questions.

iii) Each question carries EIGHT marks. **$2 \times 8 = 16$**

19. Explain the formation of stationary waves in open pipe and closed pipe. Derive the harmonic frequencies produced by them.

20. What is the principle of potentiometer? Explain how to determine the internal resistance of a primary cell using potentiometer. A battery of emf 10 V and internal resistance 3 Ω is connected to a resistance 17 Ω. Find the current in the circuit.

21. Define mass defect and binding energy. Explain how the binding energy per nucleon is varying with atomic mass? Calculate the binding energy (E_b) of α - particle. Mass of proton, 1.0073 amu, Mass of neutron 1.0087 amu and Mass of α - particle 4.0015 amu. ($4H^1 \longrightarrow 2He^4 + E_b$)