

BOARD OF INTERMEDIATE EDUCATION
SENIOR INTER PHYSICS
MODEL PAPER (ENGLISH VERSION)

TIME: 3 HOURS

MAX.MARKS: 60

SECTION – A

I. i) Very Short Answer Type questions.

ii) Answer ALL questions.

ii) Each question carries TWO marks.

10 × 2 = 20

1. What is hypermetropia? How can it be corrected?
2. Explain Brewster's Law.
3. State Gauss's Law in electrostatics.
4. Three capacitors of capacitances $1 \mu F$, $2 \mu F$ and $3 \mu F$ are connected in series with each other across a battery.
 - a) What is the ratio of charges on them?
 - b) What is the ratio of potential differences across them?
5. Define magnetic declination.
6. How are Microwaves produced?
7. A transformer transforms 200 V ac into 2000 V ac. Calculate the number of turns in the secondary if the primary has 10 turns.
8. Give two uses of infrared rays.
9. Draw the circuit symbols for p–n–p and n–p–n transistors.
10. Define modulation. Why is it necessary?

SECTION – B

II. i) Short Answer Type questions.

ii) Answer any SIX questions.

ii) Each question carries FOUR marks.

6 × 4 = 24

11. Why does the setting sun appear red?
12. Discuss the intensity of transmitted light when a polaroid sheet is rotated between two crossed polaroids?
13. Derive an equation for the couple acting on a electric dipole in a uniform electric field.
14. State the Kirchoff's Laws for electrical network. Using these laws deduce the condition for balancing in a Wheatstone bridge.

15. State and explain Biot–Savart Law.
16. Obtain an expression for the emf induced across a conductor which is moved in a uniform magnetic field which is perpendicular to the plane of motion.
17. Derive an expression for the potential and Kinetic energy of an electron in any orbit of a hydrogen atom according to Bohr's atomic model.
18. Define half life period and decay constant for a radioactive substance. Deduce the relation between them.

SECTION – C

III. i) Long Answer Type questions.

ii) Answer any TWO questions.

ii) Each question carries EIGHT marks.

$2 \times 8 = 16$

19. a) How are stationary waves formed in closed pipes? Explain the various modes of vibrations and obtain relations for their frequencies.
b) An open pipe and a closed pipe are in resonance with each other with their first overtones. Find the ratio of their lengths.
20. a) Obtain an expression for the torque on a current carrying conductor placed in a magnetic field. Describe the construction and working of a moving coil galvanometer.
b) The resistance of a moving coil galvanometer is 5Ω . The maximum current it can measure is 0.015 A. How would you convert it into a voltmeter to measure 1.5 volt?
21. a) Explain the principle and working of a nuclear reactor with the help of a labelled diagram.
b) Calculate the energy equivalent of 1 g of a substance.