

BOARD OF INTERMEDIATE EDUCATION, KARACHI

INTERMEDIATE EXAMINATION

MODEL PAPER 2026

PHYSICS PAPER – II

Max. Marks : 68

(Science Groups)

Time: 2 hours 40 Minutes

SECTION 'B'

According to New Book

(SHORT-ANSWER QUESTIONS) (36 Marks)

NOTE: Answer any **Nine** part questions from this section. All questions carry equal marks. Draw diagrams where necessary. Use of scientific calculator is allowed. All notations are used in their usual meanings.

2. i) An air storage tank whose volume is 112 liters contains 3kg of air at a pressure of 18atm. How much air would have to be forced into the tank to increase the pressure to 21atm. (Assuming no change in the temperature)
- ii) Prove that the difference between Molar Specific Heat at constant Pressure and Molar Specific Heat at constant volume is equal to Universal Gas Constant.
- iii) Calculate the change in entropy when 10kg of water is heated from 90°C to 100°C. Specific heat of water =4180 J. kg⁻¹ K⁻¹.
- iv) Describe how a galvanometer is converted into an ammeter with diagram? Derive related mathematical expression.
- v) An inductor with an inductance of 0.02H has a current of 2A flowing through it. Calculate the energy stored in the conductor.
- vi) An inductor has inductance of 0.5H and a frequency of 100Hz, calculate the inductive reactance.
- vii) What is modulus of elasticity? By the help of Hook's law derive the equation for Young's modulus.
- viii) Describe PN junction as a diode. Write its three properties.
- ix) Describe the NAND gate with truth table and diagram.
- x) Calculate the KE of an electron moving with the velocity of 0.98C in an inertial frame of reference.
- xi) Describe Pair Production and Pair Annihilation.
- xii) A 200 Ω resistor is connected with AC supply of 36V with frequency of 60Hz. Calculate:
 - a) current
 - b) power dissipated in the resistor
- xiii) Find the binding energy (in MeV) for lithium ${}_3\text{Li}^7$ (atomic mass = 7.016003 u).

SECTION 'C'

(DETAILED-ANSWER QUESTIONS) (32 Marks)

NOTE: Answer any **Two** questions from this section. All questions carry equal marks. Draw diagrams where necessary.

3. a) What is generator? Describe the working of A.C generator and derive an equation for the induced e.m.f.
b) What is Photoelectric Effect? Define the terms Threshold Frequency, Stopping Potential and Work Function. Also derive Einstein's photoelectric equation.
4. a) What is Carnot Engine? Describe the Carnot Cycle. Derive an equation for its efficiency.
b) What is Mass Spectrograph? Describe its principle, construction and working. Derive its relevant mathematical expression.
5. a) Describe the experiment for determination of e/m ratio of an electron. Derive its mathematical expression.
b) Write the postulates of Bohr's Atomic Model. Derive relation for radius of nth orbit of Hydrogen atom.

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BOARD OF INTERMEDIATE EDUCATION, KARACHI

INTERMEDIATE EXAMINATION

MODEL PAPER 2026

PHYSICS PAPER – II

Max. Marks : 17

(Science Groups)

Time: 20 Minutes

According to New Book

SECTION 'A'

(MULTIPLE CHOICE QUESTIONS) – (M.C.Qs.) (Marks : 17)

Note:

- This section consists of 17 part questions and all to be answered. Each part question carries 1 mark.
- Do not copy the part questions in your answerbook. Write only the answer in full against the proper number of the question and its part.
- The use of scientific calculator is allowed.

1. Select the correct answer for each from the given options:

- This type of solid has a periodic atomic arrangement:
* Polymeric * Amorphous * Glassy * Crystalline
- The Carnot engine is an ideal heat engine because it is:
* Made of most advanced material * Free from heat losses and friction
* Extremely powerful * Very small in size
- Population inversion occurs in:
* Active medium * Passive medium * Gaseous medium * Vapor medium
- If the temperature of a gas is tripled in kelvin at constant volume, the pressure of the gas will be:
* Doubled * Quadrupled * One third * Tripled
- The quantity of heat required to raise the temperature of one mole of a substance through one kelvin is called:
* Heat Capacity * Molar Specific Heat
* Latent Heat * Specific Heat
- In purely resistive AC circuit, the phase difference between current and voltage is:
* 0° * 45° * 90° * 180°
- Alternating current generator converts this energy into electrical energy:
* Wind * Mechanical * Solar * Chemical
- Momentum of photon is:
* $\frac{hc}{\lambda}$ * $\frac{h}{\lambda}$ * $\frac{\lambda}{h}$ * $\frac{c}{\lambda}$
- To produce X-rays, an element of high atomic weight is bombarded by:
* Photons * Electrons * Helium nuclei * Neutrons
- In Photoelectric Effect, increasing the intensity of light will increase the:
* Frequency of light * Wavelength of light
* Number of protons * Number of photoelectrons
- The number of electrons in one coulomb charge is:
* 1.6×10^{18} * 1.6×10^{-19} * 6.25×10^{18} * 9.1×10^{19}
- The diode radiating visible light when energized is called:
* Photo diode * Photovoltaic diode
* Photo conducting cell * Light emitting diode
- In photoelectric effect, the amount of energy required to eject an electron from the surface of metal is called:
* Threshold frequency * Binding energy * Work function * Stopping potential
- A thermodynamics process at constant volume is called:
* Isothermal * Isochoric * Adiabatic * Isobaric
- Kinetic energy per mole of an ideal gas is:
* $\frac{3}{2} kT$ * $\frac{2}{3} kT$ * $\frac{3}{2} RT$ * $\frac{2}{3} RT$
- Balmer series of hydrogen atom spectrum lies in this region:
* Infrared * Ultraviolet * Visible * Radio-wave
- Compton Effect proves the:
* Photon Theory of Light * Wave Nature of Light
* Dual Nature of Light * Uncertain Nature of Light

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