# BOARD OF INTERMEDIATE EDUCATION, KARACHI

**INTERMEDIATE EXAMINATION**

**MODEL PAPER 2026**

## PHYSICS PAPER – I

Max. Marks : 17 **(Science Groups)** Time: 20 Minutes

According to New Book

## SECTION 'A'

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

**NOTE:**
i) This section consists of 20 part questions and all are to be answered. Each part question carries one mark.
ii) This Section 'A' of Multiple Choice Question (MCQs) must be solved on the **MCQs/OMR sheet** enclosed on the last page of provided **E-Sheet & OMR** (Examination Copy).
iii) The correct answer bubble must be filled on MCQs / OMR sheet 1) (A) (B) (C) (D)
iv) Use only blue / black ball point on MCQs / OMR sheet.
v) Avoid pencil / White-o pen / correction pen / ink remover and gel pen to solve the question on MCQs / OMR sheet.
vi) All notations are used in their usual meanings. The use of Scientific Calculator is allowed.

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

1. A ball is thrown upward with a velocity of $100\,m/s$. The time it takes to reach the ground is: $\left(g = 10\,m/s^2\right)$
   A) 5 second B) 10 second C) 20 second D) 40 second

2. If the dot product of two non-zero vectors vanishes, then vectors are:
   A) perpendicular B) parallel C) in opposite directions D) at an angle of 45

3. This force is also called a self-adjusting force:
   A) Friction B) Tension C) Weight D) Thrust

4. A wooden block of volume $0.05\,m^3$ is floating on the surface of water. The buoyant force acting on the block is: $\left(\text{Density of water}=1000\,\text{kg/m}^3\right)$
   A) $500\,\text{N}$ B) $50\,\text{N}$ C) $5000\,\text{N}$ D) $5\,\text{N}$

5. The SI-unit of conductance is:
   A) Ohms$(\Omega)$ B) siemens$(S)$ C) ampere$(A)$ D) volt$(V)$

6. Coulomb's force in a dielectric medium is less than that in vacuum, due to:
   A) Ionization B) Electric polarization
   C) Magnetization D) Superposition

7. The displacement-time graph for simple harmonic motion is:
   A) straight line B) circle C) ellipse D) sine curve

8. The Doppler Effect is used in this medical imaging technique:
   A) Ultrasound B) X-rays
   C) Magnetic resonance image D) Computed Tomography Scan

9. The superposition of signal wave on a carrier wave is called:
   A) Modulation B) Diffraction C) Polarization D) Refraction

10. The unit of electric flux is:
    A) $V/m$ B) $N/m$ C) $N\cdot m^2/C$ D) $N/C$

11. The resistance of a superconductor below a critical temperature is:
    A) Infinite B) Zero C) Finite D) Unchanged

12. In SHM, kinetic energy is maximum at:
    A) extreme position B) mean position
    C) between mean and extreme positions D) mean and extreme positions

13. The dimensions of angular momentum are given by:
    A) $ML^{-1}T^{-2}$ B) $ML^2T^{-1}$ C) $M^0L^2T^{-1}$ D) $MLT^{-3}$

14. A body weighs $10\,\text{N}$ out of water and $7\,\text{N}$ when submerged in water. The buoyant force on the body will be:
    A) $3\,\text{N}$ B) $5\,\text{N}$ C) $7\,\text{N}$ D) $10\,\text{N}$

15. A mass spring-oscillator has a time period $T$, if the mass is doubled, the time period will become:
    A) $T$ B) $2T$ C) $\sqrt{2}T$ D) $T/\sqrt{2}$

16. This electromagnetic wave has the shortest wavelength:
    A) Radio wave B) Ultraviolet wave C) Microwaves D) Infrared wave

17. The maximum number of beats that can be heard by human is:
    A) 3 B) 5 C) 7 D) 9

----------xxxxxxxxxx----------

# BOARD OF INTERMEDIATE EDUCATION, KARACHI

**INTERMEDIATE EXAMINATION**

**MODEL PAPER 2026**

## PHYSICS PAPER – I

Max. Marks : 68 **(Science Groups)** Time: 2 hours 40 Minutes

**INSTRUCTIONS:** i) SECTION **'B'** and SECTION **'C'** must be solved on provided **E-Sheet** (Examination Copy).
ii) Student are instructed to write their answers on page allocated for the respective question number.

**According to New Book**

**SECTION 'B'**

**(SHORT-ANSWER QUESTIONS)** **(36 Marks)**

**NOTE:** Answer any **Nine** part questions from this section. All part questions carry equal marks. Draw diagrams where necessary. Use of scientific calculator is allowed.

**2.** i) What is an ideal banking angle for a turn of 1.20 km radius on a highway with a 105 km/h speed limit?

ii) Prove the following equations are dimensionally correct:

* $F = \frac{mv^2}{r}$ * $2aS = vf^2 - vi^2$

iii) Two tug boats are towing a ship, each exerting a force of 6000 N and the angle between two forces is 60°. Calculate the resultant force on the ship.

iv) A 50g bullet is fired into a 10kg block suspended by a cord. The center of gravity of block rises by 10cm. What is the speed of bullet?

v) A car starts from rest and moves with a constant acceleration. During the $5^{th}$ second of its motion it covers a distance of 36m. Calculate acceleration of the car.

vi) A 70kg man runs up a hill through a height of 3m in 2s. Calculate the work done and power output?

**OR**

A 20m long wire has a cross sectional area of $1mm^2$ and a resistance of $5\Omega$. Calculate the conductance of the material of wire.

vii) A particle having charge $2\times10^{-19}C$, is held in an electric field between two parallel metal plates 4cm apart, is acted upon by a force of $10^{-4}N$. What is the intensity of the electric field?

**OR**

The period of oscillation of an object of an ideal mass-spring system is 0.50s and the amplitude is 5cm. What is the speed of object at equilibrium position?

viii) If the speed of sound in air at $27°C$ is $345m/s$, find the speed at $127°C$.

**OR**

A source of sound and a listener are moving toward each other with velocities 0.5 times and 0.2 times the speed of sound respectively. If the frequency of emitted sound is 2000Hz, calculate the change in the frequency heard by the listener.

ix) Derive an equation for balanced Wheatstone bridge.

**OR**

Define Electric flux, write its SI unit. Under what conditions the electric flux through a surface will be:

* Maximum * Minimum

x) Prove that the gravitational field of earth is conservative.

**OR**

What is interference of light? Write three conditions of interference of light.

**SECTION 'C'** **(DETAILED-ANSWER QUESTIONS)** **(32 Marks)**

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

**3.** Two vector $\overrightarrow{A_1}$ and $\overrightarrow{A_2}$ are making angles $\theta_1$ and $\theta_2$ with x-axis respectively. Derive the formulae for the magnitude and direction of the resultant vector.

**4.** Define Simple Harmonic Motion. A particle is moving in a circle with a constant speed; prove that its projection executes simple harmonic motion along the diameter of the circle.

**5.** Define the capacitance of a capacitor. Derive mathematical relations for the capacitance of parallel plate capacitor when:

i) Air is present between the plates ii) A dielectric slab is present between the plates

**OR**

Two smooth, rigid and not-rotating spheres of masses $m_1$ and $m_2$, moving with initial velocities $U_1$ and $U_2$ respectively, collide elastically in one dimension. Derive the expression for the velocity of any one of the sphere after collision.

**6.** State Bernoulli's Theorem and derive its equation.

**OR**

What are Newton's Rings? Explain the process of their formation. Derive the expressions for the radii of nth bright and dark rings.

**7.** What are Stationary Waves? If stationary waves are set up in a stretched string, derive expressions for the frequencies when string is vibrating in:

i) One loop ii) Two loops iii) Three loops iv) n loops

**OR**

What is an Electric Dipole? Derive the expression for electric field intensity at a point at perpendicular distance 'y' from the center of the dipole.

----------xxxxxxxxxx----------