

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, PESHAWAR

Higher Secondary School Certificate (H.S.S.C.) Examination

PHYSICS · Inter Part-I (Class XI)

Ref: PR XI (01) 23 · Physics (New) ·
Fresh/Reappear

Annual Examination 2023

Total time: 3 hours

SECTION - A (Objective)

Time: 20 minutes · Marks: 18

Each question has four options. Choose the correct option. (The printed instructions for this section are in Urdu; given here in English.)

1	As water in a level pipe passes from a narrow cross-section of pipe to a wider cross-section, the pressure against the wall	(A) Increases	(B) Decreases	(C) is zero	(D) Remains same
2	The time period of the same pendulum at Karachi and Muree are related as	(A) $T_K = T_M$	(B) $T_K > T_M$	(C) $T_K < T_M$	(D) $2T_K = 3T_M$
3	The product of frequency and time period is	(A) 1	(B) 2	(C) 3	(D) 4
4	Distance covered by wave in one (01) second is	(A) Wavelength	(B) Wave number	(C) Frequency	(D) Wave speed
5	Distance between crest and trough is	(A) λ	(B) $\frac{\lambda}{2}$	(C) $\frac{\lambda}{4}$	(D) 2λ
6	Which of the given is not properly exhibited by longitudinal waves?	(A) Reflection	(B) Interference	(C) Diffraction	(D) Polarization
7	If the amplitude of a wave is double, then its intensity is	(A) Doubled	(B) Halved	(C) One fourth	(D) Quadripled
8	Colour fringes observed in soap bubbles are examples of	(A) Diffraction	(B) Interference	(C) Polarization	(D) Reflection
9	In which of the given systems, the entropy is decreasing?	(A) A plate is shattered (C) An egg is scrambled	(B) A gas is cooled (D) A drop of dye diffuses in a cup of water		
10	The precision of measurement 385,00 Km is	(A) 1 km	(B) 100 km	(C) 1000 km	(D) 10,000 km
11	For which angle the equation $ \vec{A} \cdot \vec{B} = \vec{A} \times \vec{B} $ is correct?	(A) 30°	(B) 45°	(C) 60°	(D) 90°
12	The time rate of change of momentum gives	(A) Force	(B) Impulse	(C) Acceleration	(D) Power
13	To improve the jumping record, the long jumper should jump at an angle of	(A) 45°	(B) 60°	(C) 90°	(D) 90°
14	Dimension of Plank's constant 'h' is	(A) ML^2T	(B) ML^2T^{-2}	(C) ML^2T^2	(D) ML^2T^{-1}
15	An example of non-conservative force is	(A) Frictional force (C) Electric force	(B) Magnetic force (D) Gravitational force		
16	If momentum is increased by 20%, then K.E increases by	(A) 44%	(B) 55%	(C) 66%	(D) 77%
17	The time period of earth is	(A) 3153600 sec	(B) 3253600 sec	(C) 2953142 sec	(D) 3353600 sec
18	A unit for viscosity, the centipoises is equal to which of the given?	(A) 10^{-3} Nsm^{-2}	(B) 10^{-2} Nsm^{-2}	(C) 10^2 Nsm^{-2}	(D) 10^3 Nsm^{-2}

Note: Time allowed for Section-B and Section-C is 2 Hours and 40 minutes.

Section - B

Marks: 40

Attempt any TEN parts. Each part carries FOUR marks.

Q.1 How many radians account for circumference of a circle? How many steradians account for circumference of a sphere?

Q.2 Differentiate between precision and accuracy.

Q.3 Is it possible to add three vectors of equal magnitude but different directions, to get a null vector? Illustrate with a

diagram.

- Q.4 Can a scalar product of two vectors be negative? Provide a proof and give an example.
- Q.5 Differentiate between elastic and inelastic collision by giving at least one example.
- Q.6 Does the tension in the string of a swinging pendulum do any work? Explain.
- Q.7 Show that satellite near the earth will have greater velocity.
- Q.8 Why does smoke rise faster in a chimney on a windy day?
- Q.9 Is it possible for a person to distinguish between a raw egg and a hard boiled egg by spinning each on a table? Explain.
- Q.10 Differentiate between free and forced oscillation.
- Q.11 Give two applications in which resonance plays an important role.
- Q.12 A wave generator produces 500 pulses in 10 sec. Find the period and frequency of the pulses.
- Q.13 How might one can locate the position of nodes and antinodes in a vibrating string?

Section - C

Marks: 27

Note: Attempt any THREE questions. All questions carry equal marks.

- Q-14 (a) State and explain Huygen's principle. What is the difference between spherical and plane wave fronts? (5)
- (b) A bullet is fired in air at a speed of 500 m/s making an angle of 60° with horizontal from an AK-47 riffle. (4)
- (i) How high will the bullet rise?
- (ii) What time would it take to reach ground?
- (iii) How far would it go? (ignore air resistance)
- Q-15 (a) Show that angular momentum in magnitude is given by $|\vec{L}| = |\vec{r} \times \vec{p}| = mr^2\omega = mvr$ (5)
- (b) To what height can a 400W engine lift a 100 kg mss in 3s (4)
- Q-16 (a) What is terminal velocity? Derive mathematical relation for terminal velocity by using Stocks's Law. (5)
- (b) The radius of a small droplet in air is found to be 5.1×10^{-6} m. Coefficient of viscosity of air is 1.9×10^{-5} kg $m^{-1}s^{-1}$. Find out the settling speed of droplet in air. (4)
- Q-17 Write a short note on any two of the following:
- (a) Torricelli's Theorem (Speed of efflux) **(4.5)**
- (b) Resonance **(4.5)**
- (c) Laplaces Correction **(4.5)**

Notes on this transcription

1. The source answer sheet arrived with bubbles already shaded in; options are transcribed unmarked. No answer key is included.
2. Q-16(b) prints the viscosity of air as 1.9×10^5 kg $m^{-1}s^{-1}$; the physical value is 1.9×10^{-5} . Kept as printed. Section A Q.13 prints 90° as both the third and the fourth option; Q.10 prints "385,00 Km" — both as on the sheet.
3. Q.1 of Section B speaks of steradians for the "circumference" of a sphere (surface is meant). Board spellings kept verbatim: "Muree", "Quadriple", "Plank's", "riffle", "mss", "Stocks's Law", "Laplaces", "How might one can". A stray handwritten figure beside the Section C note on the scan is omitted.
4. The left edge of the objective scan clips the question numbers 13-18; numbering follows the printed sequence. The 3-hour total time is not printed; it is the standard total (20 min + 2 h 40 min).