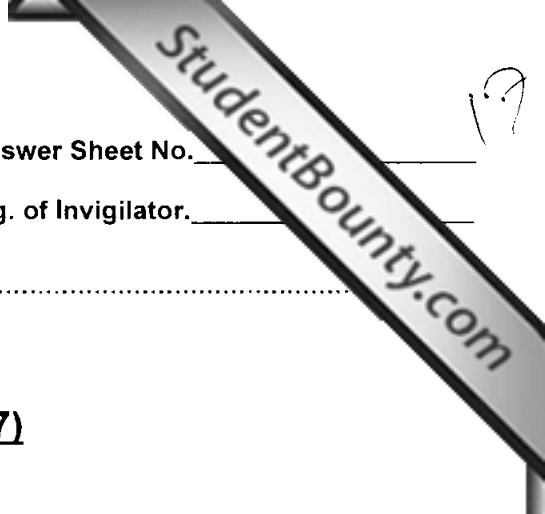




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Sig. of Invigilator. _____

Time allowed: 25 Minutes

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

- Page 1 of 2 (Phy)

- (ix) To determine the interplaner space, equation used is _____
- A. $d \sin \theta = n\lambda$ B. $2d \sin \theta = n\lambda$
 C. $\frac{d \sin \theta}{2} = n\lambda$ D. $\sin \theta = n\lambda$
- (x) One dyne is equal to _____
- A. $10^3 N$ B. $10^5 N$
 C. $10^{-5} N$ D. $10^{-3} N$
- (xi) If $\vec{A} = 4\hat{i} + 3\hat{j}$ then its unit vector will be _____
- A. $\frac{2\hat{i} + 3\hat{j}}{6}$ B. $\frac{6}{2\hat{i} + 3\hat{j}}$
 C. $\frac{4\hat{i} + 3\hat{j}}{5}$ D. $\frac{5}{4\hat{i} + 3\hat{j}}$
- (xii) The slope of Velocity-Time graph at any instant represents _____
- A. Gravity B. Average acceleration
 C. Instantaneous acceleration D. Velocity
- (xiii) Thermal pollution is an inevitable consequence of the _____
- A. 1st law of thermodynamics B. 2nd law of thermodynamics
 C. 2nd law of motion D. 1st law of motion
- (xiv) The efficiency of a heat engine can be increased by increasing the temperature of _____
- A. Engine B. Cold reservoir
 C. Hot reservoir D. None of these
- (xv) An organ pipe is 50 m long, with one end closed. Its fundamental frequency will be _____
- A. 250 Hz B. 330 Hz
 C. 360 Hz D. 350 Hz
- (xvi) In a multimode step index fibre, density of the optical material decreases from _____
- A. Edges to core B. Core $\rightarrow$ edges
 C. Even D. Multiple
- (xvii) Glass-air boundary acts as a/an _____
- A. Mirror B. Glass
 C. Water D. Air

For Examiner's use only:

Total Marks:

17

Marks Obtained:



PHYSICS HSSC-I

Time allowed: 2:35 Hours

Total Marks Sections B and C

NOTE: Sections B and C comprise pages 1-2. Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 3 to 4 lines. (14 x3 = 42)

- (i) Specific heat of gas at constant pressure is greater than specific heat at constant volume. Why?
- (ii) Relate work done of a moving particle with its energy.
- (iii) Why is the 1st law of motion also titled as the law of Inertia?
- (iv) Pair the physical quantities having the same dimension:
 - a. Acceleration
 - b. Force
 - c. Work done
 - d. Rate of change of mom
 - e. Kinetic Energy
 - f. Gravity
- (v) Two masses m_1 and m_2 are attached to a compressed spring at rest. What will be the ratio of their final velocity?
- (vi) Relate how orbital speed of a satellite depends on its radius.
- (vii) Define Radian.
- (viii) The magnitude of dot-product and cross product of two vectors is $6\sqrt{3}$ and 6, respectively. Find the angle between the vectors.
- (ix) Give any three examples of non-conventional energy sources.
- (x) Find the angle between $\vec{A} = 5\hat{i} + \hat{j}$ and $\vec{B} = 2\hat{i} + 4\hat{j}$
- (xi) Why would it be advantageous to use Blue light for a compound microscope?
- (xii) In optical fibre system, how can the time difference of different dispersions be reduced?
- (xiii) What are the conditions used, while calculating time period of a simple pendulum?
- (xiv) Write an expression that harmonics are integral multiple of fundamental note, for stationary waves.
- (xv) Compare expression of $a = -\omega^2 x$ with the rate of change in velocity.
- (xvi) State the direction of the following vectors in simple situation:
 - a. Angular momentum
 - b. Angular velocity
- (xvii) Define Torr.
- (xviii) Certain globular particle has a density of 1246 kg m^{-3} . It falls through pure water ($\eta = 8.0 \times 10^{-4} \text{ Nm}^{-2}\text{s}$) with a terminal speed of 3.0 cm h^{-1} . Find the radius of the particle.
- (xix) The diameter and length of a metallic cylinder is 1.22 cm and 5.35 cm, respectively. What will be the volume of the cylinder?

SECTION – C (Marks 26)

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

- Q. 3**
- a. Prove that during one dimension elastic motion relative speed of approach is equal to the relative speed of separation. 04
 - b. A foot-ball is thrown upward with an angle of 30° with respect to horizontal. To throw a 40 m pass, what must be the initial speed of the ball? 03
 - c. Define Impulse and show its relation to linear momentum. 07
- Q. 4**
- a. Derive Bernoulli's equation for fluid. 03
 - b. Water flows through a hose, whose internal diameter is 1 cm at a speed of 1ms^{-1} . What should be the diameter of the nozzle if the water is to emerge at speed of 21ms^{-1} ? 03
 - c. In an orbiting space-station, would the blood pressure in major arteries of the legs be greater than the blood pressure in the major arteries of neck. 03
- Q. 5**
- a. During Young's Double Slit Experiment, explain how the interfringes distance also depends upon the wavelength of the light used. 07
 - b. Explain the colours spectrum on an oil film spreading over a wet footpath. 03
 - c. A light is incident normally on a grating which has 2500 lines/cm. Compute the wavelength of a spectral line for which the deviation of second order is 15.0° . 03

— 1HA 1308 (L) —

- (x) Unit of angular momentum in System International is _____
- A. $kg - m^{-1} - sec^{-1}$ B. $kg - m^{-1}$
 C. $kg - m^2 - sec^{-1}$ D. None of these
- (xi) To calculate the speed of light which formula did Michelson use?
- A. $c = \sqrt{fd}$ B. $c = \frac{1}{16fd}$
 C. $c = 16fd$ D. $c = \frac{1}{16}fd$
- (xii) Dimension of Power is _____
- A. ML^2T^{-2} B. $M^2L^2T^{-1}$
 C. ML^2T^{-3} D. ML^3
- (xiii) In head to tail arrangement the sum of a closed polygon will be _____
- A. 1 B. Zero
 C. -1 D. +2
- (xiv) Drag force between the layers of moving fluid _____
- A. Remains constant B. Decreases
 C. Increases D. None of these
- (xv) Phenomenon that can be explained on the basis of Principle of superposition are _____ in number.
- A. 1 B. 2
 C. 3 D. 4
- (xvi) The position at which stationary waves have maximum displacement from the mean position is called _____
- A. Node B. Anti-node
 C. Displacement D. Mean position
- (xvii) For a normal adjustment, in a telescope, the magnifying power is _____
- A. $f_o \div f_e$ B. $f_e \div f_o$
 C. $\frac{1}{f_o}$ D. $f_o + f_e$

For Examiner's use only:

Total Marks:

17

Marks Obtained:

— 1HA 1308 (ON) —



PHYSICS HSSC-I

Time allowed: 2:35 Hours

Total Marks Sections B and C:

NOTE: Sections B and C comprise pages 1-2. Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 3 to 4 lines. (14 x3 = 42)

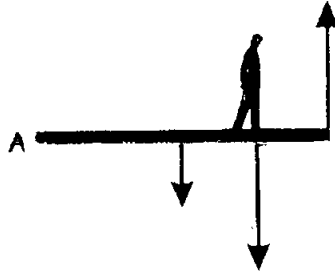
- (i) Explain why sound travels faster in warm air than in cold air.
- (ii) Apply the conditions of equilibrium on a paratrooper jumping from a helicopter.
- (iii) Name any three conditions that would make $\vec{A}_1 \times \vec{A}_2 = 0$
- (iv) Find the work done if the applied force $\vec{F} = 3\hat{i} + 2\hat{j}$ moves a block of mass m from point (2, -1) to point (6,4).
- (v) Why do we call gravitational field, a conservative one also?
- (vi) A brick of mass 2 kg is dropped from a height of 5m. What would be its velocity at a height of 3 m before hitting the ground?
- (vii) Give rotational analogue of the 2nd law of motion.
- (viii) Prove that 1 rad= 57.3°
- (ix) What is Critical velocity?
- (x) Relate the effect of wavelength and resolving power.
- (xi) Give the mathematical relation of law of conservation of mass for a flowing efflux.
- (xii) What happens when a jet plane flies faster than the speed of sound?
- (xiii) Find the fundamental notes for a pipe 1m long when:
 - a. Both the ends are closed
 - b. One end is open
- (xiv) Relate Doppler's Effect and frequency of light emitted from the stars.
- (xv) Distinguish between Un-polarized and Plane polarized light.
- (xvi) In a double slit experiment, the 2nd order maximum lies at $\theta = 0.25^\circ$. If the wavelength used is 650 nm then determine the slit separation.
- (xvii) Why do Gases have two specific heats?
- (xviii) Is it true that diesel engine does not need an ignition spark? If yes then why?
- (xix) Find the dimension of co-efficient of viscosity.

SECTION – C (Marks 26)**Note: Attempt any TWO questions. All questions carry equal marks.**

(2)

- Q. 3**
- Explain turning effect of a body of mass m .
 - A uniform beam of 200 N is supported horizontally. If the breaking tension of the rope is 400 N, how far can a man of weight 400 N walk from point A, on the beam as shown in the following diagram:

04



- Can a vector have a component greater than vector's magnitude? 02
- Q. 4**
- Evaluate the force needed to bend the normally straight path of the particle of mass m , into a circular path. 07
 - Calculate the angular momentum of a star of mass $2.0 \times 10^{30} \text{ kg}$ and Radius $7.0 \times 10^5 \text{ km}$.
If it makes one complete rotation about its axis once in 20 days, what is its kinetic energy? 04
 - What should be the minimum number of geostationary satellites, required to give full global coverage of T.V transmission. 02
- Q. 5**
- Using the equation of efficiency of an engine, explain that increase in the efficiency depends upon the temperature of hot reservoirs. 06
 - State the postulates of kinetic theory of gases. 04
 - Find the average speed of oxygen molecule in the air at S.T.P 03