

Section - A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

PHYSICS HSSC-I

SECTION - A (Marks 17)

Time allowed: 25 Minutes

حصہ اول لازماً پڑھنا ہے۔ اس حصہ کے تمام سوالات کو حل کرنا ضروری ہے۔ اس حصہ کے جوابات کاغذ پر لکھ کر مرکز کے حوالے کریں۔ ہر سوال کے سامنے دیے گئے درست دائرہ کو پر کریں۔

Fill the relevant bubble against each question:

- Which of the following is the base unit of pressure? ☐ $kg\ ms^{-1}$ ☐ $kg\ m^{-1}s^{-2}$ ☐ $kg\ m^2\ s^{-2}$ ☐ $kg\ m^{-2}\ s^{-1}$
- Error in the measurement of radius of sphere is 1%. The error in the calculated value of its volume is: ☐ 1% ☐ 2% ☐ 3% ☐ 4%
- If $A_x = A_y$, then the angle between vector \vec{A} and X-axis is: ☐ 30° ☐ 45° ☐ 60° ☐ 90°
- If the magnitudes of scalar and vector products of two vectors \vec{A} and \vec{B} are same, then angle between them will be: ☐ 30° ☐ 45° ☐ 60° ☐ 90°
- Distance covered by a freely falling body in 2 seconds will be: ☐ 9.8 m ☐ 4.9 m ☐ 29.4 m ☐ 19.6 m
- If a ball is thrown with a speed of $30\ ms^{-1}$ in a direction 30° with X-axis, then time of flight is: ☐ 3s ☐ 4s ☐ 5s ☐ 6s
- If the radius of moon is 1600 km and g on the surface of moon is $1.6\ ms^{-2}$, then the escape velocity on moon is: ☐ $1600\ ms^{-1}$ ☐ $1800\ ms^{-1}$ ☐ $2000\ ms^{-1}$ ☐ $2263\ ms^{-1}$
- The angular velocity of the second hand of a clock, in radians per second, is: ☐ $\frac{\pi}{2}$ ☐ $\frac{\pi}{3}$ ☐ $\frac{\pi}{4}$ ☐ $\frac{\pi}{30}$
- Which of the following is TRUE for orbital velocity? ☐ $v \propto r$ ☐ $v \propto \frac{1}{\sqrt{r}}$ ☐ $v \propto \frac{1}{r}$ ☐ $v \propto \sqrt{r}$
- A 2m high tank is full of water. If a hole appears at its middle, then the speed of efflux is: ☐ $2.42\ ms^{-1}$ ☐ $3.42\ ms^{-1}$ ☐ $4.42\ ms^{-1}$ ☐ $5.42\ ms^{-1}$
- For what displacement the P.E becomes one fourth of its maximum value? ☐ $x = x_0$ ☐ $x = \frac{x_0}{2}$ ☐ $x = \frac{x_0}{\sqrt{2}}$ ☐ $x = \frac{x_0}{4}$

- A simple pendulum suspended from the ceiling of a lift has time period T , when the lift is at rest. When the lift falls freely, the time period is: ☐ 0 ☐ $\frac{T}{g}$ ☐ $\frac{g}{T}$ ☐ Infinite
- Increase in velocity of sound in air for $1^\circ C$ rise in temperature is: ☐ $1.61\ ms^{-1}$ ☐ $61.0\ ms^{-1}$ ☐ $0.61\ ms^{-1}$ ☐ $0.16\ ms^{-1}$
- The distance between two consecutive crests or troughs is equal to: ☐ λ ☐ 2λ ☐ $\frac{\lambda}{2}$ ☐ $\frac{\lambda}{4}$
- It is possible to distinguish between transverse and longitudinal waves from the property of: ☐ Refraction ☐ Reflection ☐ Polarization ☐ Diffraction
- For isothermal process, first law of thermodynamics can be written as: ☐ $\Delta Q = \Delta U$ ☐ $\Delta Q = 0$ ☐ $\Delta Q = -\Delta U$ ☐ $\Delta Q = \Delta W$
- According to first law of thermodynamics: ☐ $\Delta U = \Delta W - \Delta Q$ ☐ $\Delta U = \Delta Q - \Delta W$ ☐ $\Delta W = \Delta Q + \Delta U$ ☐ $\Delta Q = \Delta U - \Delta W$

Important formulae:

- $V_{sphere} = \frac{4}{3}\pi r^3$
- $g = 9.8\ ms^{-2}$
- $T_{flight} = \frac{2v_i \sin \theta}{g}$
- $|\vec{A} \cdot \vec{B}| = AB \cos \theta$
- $v_{esc} = \sqrt{2gR}$
- $|\vec{A} \times \vec{B}| = AB \sin \theta$
- $v_2 = \sqrt{2g(h_1 - h_2)}$
- $S = r\theta$
- $P.E_{int} = \frac{1}{2}kx^2$
- $P.E_{max} = \frac{1}{2}kx_0^2$
- $\omega = \frac{\theta}{t}$
- $v_r = v_0 + (0.61)t$
- $v_0 = 332\ ms^{-1}$ at $0^\circ C$
- $T = 2\pi \sqrt{\frac{l}{g}}$
- $C_p - C_v = R$