

Sig. of Supdt.....

Roll No.....

Fic. No.....

Code : H

Fic. No.....

Time allowed: 3 Hrs

Physics (Part – I)
Fresh / Reappear

Marks: 85

Note: There are three sections of the paper, A, B & C. Attempt Section – A on the same paper and return it to the Superintendent within the given time. No marks will be awarded for cutting, erasing or over writing. Mobile phone etc. are not allowed in the examination hall.

Time: 20 Mins

Section "A"

Marks: 18

Q.1 Write the correct option i.e. A, B, C or D in the empty box provided opposite each part.

- i. Acceleration due to gravity (g) in ft/s^2 is D
A. 98 B. 89 C. 23 D. 32
- ii. The dimension of impulse is similar to that of A
A. Momentum B. Force C. Velocity D. Torque
- iii. The cross product of two parallel vector is B
A. $AB \sin\theta \hat{n}$ B. 0 C. $\vec{0}$ D. AB
- iv. The magnitude of the vector $\vec{i} - \vec{j}$ is
A. 0 B. 1 C. 2 D. $\sqrt{2}$
- v. Radian is the SI unit of D
A. Radius B. Length C. Angle D. Distance
- vi. The angular speed in rad/ hr for daily rotation of our earth is D
A. 2π B. 4π C. $\pi/6$ D. $\pi/12$
- vii. Equation of continuity is based upon the law of conservation of B
A. Energy B. Mass C. Momentum D. Charge
- viii. The SI unit of coefficient of viscosity is A
A. Kg/m.s B. Kgm/s C. Kg.m.s D. Kg.s/m
- ix. In an isolated system the total energy of vibrating mass spring is D
A. Variable B. Low C. High D. Constant
- x. The frequency of second pendulum is C
A. 1Hz B. 2Hz C. 0.5Hz D. 0.25Hz
- xi. Distance between two consecutive nodes is B
A. $\lambda/4$ B. $\lambda/2$ C. $\lambda/3$ D. λ
- xii. Sound waves travel faster in B
A. Air B. Water C. Solid D. Vacume
- xiii. Coloured fringes observed in soap bubbles are the examples of B
A. Diffraction B. Interference C. Polarization D. Reflection
- xiv. The principle of Michelson interferometer is based on the division of B
A. Wave front B. Amplitude C. Frequency D. Speed of light
- xv. A real gas can be approximated to an ideal gas at A
A. Low density B. High pressure C. High density D. Low temperature
- xvi. Peta x pico = B
A. Kilo B. Milli C. Exa D. Nano
- xvii. The dimensions of frequency f are C
A. $[T^{-1}]$ B. $[LT^{-1}]$ C. $[MT^{-1}]$ D. $[MT^{-2}]$
- xviii. The number of significant figure in 0.000063 is
A. 6 B. 5 C. 2 D. 3

Physics (Part – I)

Fresh/Reappear

Section "B"

Marks: 40

Q.2 Attempt any TEN parts. Each parts carries equal marks.

- i. Calculate a speed of 20 m/s in Km/hr.
- ii. What is the minimum number of unequal vectors to result into a null vector? Explain with diagram.
- iii. What is head on collision? Explain with an example.
- iv. Show that the rate of change of momentum is equal to the applied force?
- v. Show that 1KWh = 3.6 mega J.
- vi. Why does the coasting rotating system slow down as water drops into the beaker?
- vii. Why a car has oblong shape design?
- viii. Is there a connection between F and x in mass spring system? Explain
- ix. Why does the speed of a sound wave in a gas changes with temperature?
- x. What is the difference between interference and diffraction?
- xi. Write the conditions to observe interference of light?
- xii. Why $C_p > C_v$? Explain.
- xiii. Define first law of thermodynamics.

Section "C"

Marks: 27

Note: Answer any THREE questions, Each question carries equal marks.

- Q.3.a. Show that the speed of sound in a given gas is independent from the pressure?
 - b. Find the speed of sound in a neon gas at 0°C . γ for mono atomic gas = 1.66.
- Q.4.a. Stat the equation of continuity. Show that how it is based on law of conservation of mass?
 - b. Water flows through a pipe whose internal diameter is 2cm at a speed of 1m/s. What would be the diameter of the nozzle if the water is to emerge at a speed of 4m/s?
- Q.5.a. Define angular momentum and show that $L = I\omega$.
 - b. What should be the orbital speed to launch a satellite in a circular orbit 900km above the surface of the earth?
- Q.6.a. Define rectangular components of a vector? Explain addition of vectors by rectangular components.
 - b. Find the two forces such that sum of the magnitudes of two forces is 16N. If the resultant force is 8N and its direction is perpendicular to minimum force?