

PHYSICS Part-I Time: 20 Minutes Marks: 18 Multiple Choice Questions 01 Mark for each	Paper Code ① ② ●	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Roll No. of the Student</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> </table> Serial No. Of the Answer Book _____	Roll No. of the Student					
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SECTION-A

Note:

- 1) Attempting all MCQs is compulsory. This paper along with the OMR sheet must be returned to the superintendent after due time.
- 2) Fill the circle (A) (B) (C) (D), which one is correct with blue or black ball point, in this sheet as well as in separate OMR Sheet like ●
- 3) If more than one circle in the OMR sheet is filled then no credit will be given to such answer.

- I.i. Temperature at the center of earth is approximately _____.
- (A) 2000C° (B) 3000C° (C) 4000C° (D) 5000C°
- ii. The atmosphere is held to the earth by _____.
- (A) Clouds (B) Gravity (C) Winds (D) Rotation of earth
- iii. Relation between linear & angular acceleration is given by _____.
- (A) $\vec{r} \vec{a}$ (B) $\vec{r} \omega$ (C) $-\omega^2 \vec{r}$ (D) $-\vec{\omega} \vec{r}$
- iv. The angular speed in radians per hours for daily rotation of our earth is _____.
- (A) $\pi/12$ (B) 4π (C) $\pi/6$ (D) 2π
- v. A rain drop of radius 'r' falls in air with terminal speed V_t . Then terminal speed of a rain drop of radius 2r is _____.
- (A) V_t (B) $\frac{V_t}{2}$ (C) $4V_t$ (D) $2V_t$
- vi. In an inelastic collision, _____ is conserved.
- (A) P.E (B) K.E (C) Both KE & P.E (D) Momentum
- vii. Area under velocity time graph is called _____.
- (A) Speed (B) Velocity (C) Distance Traveled (D) Acceleration
- viii. For $\vec{R} = \vec{F}_1 + \vec{F}_2$ then angle between $\vec{F}_1$ & $\vec{F}_2$ is _____.
- (A) 0° (B) 45° (C) 90° (D) 120°
- ix. If R_x is -ve & R_y is +ve then "θ" lies in _____ quadrant.
- (A) 1st (B) 2nd (C) 3rd (D) 4th
- x. The number of significant figures in 0.000200kg are _____.
- (A) Two (B) Three (C) Four (D) Six
- xi. One "Tera" is equal to _____.
- (A) 10^{18} (B) 10^{15} (C) 10^{12} (D) 10^9
- xii. The SI unit of molar specific heat is _____.
- (A) J.mole.k⁻¹ (B) J.mole⁻¹.k (C) J.mole⁻¹.k⁻¹ (D) mole.K⁻¹.J⁻¹
- xiii. The value of Joules constant J= _____.
- (A) 3.18 J/calorie (B) 4.18 J/calorie (C) 5 J/calorie (D) 6.18 J/calorie
- xiv. The effect produced to the super position of two coherent light waves is called _____.
- (A) Interference (B) Polarization (C) Refraction (D) Diffraction
- xv. The wave length of visible light is about _____.
- (A) 10^6m (B) 10^{-6}cm (C) 10^{-6}m (D) 10^6cm
- xvi. The theoritical value of speed of sound in a gas is _____ less than the experimental value.
- (A) 6% (B) 16% (C) 26% (D) 20%
- xvii. To make frequency double of a spring oscillation, we have to _____ the mass.
- (A) Double (B) Half (C) Quadruple (D) Reduce to $\frac{1}{4}$
- xviii. The device used to measure the rate of flow of liquid in pipe is called _____.
- (A) Venturi meter (B) Calori meter (C) Carburetor (D) Spectrometer

PHYSICS Part-I

Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"

Marks: 40

I. Attempt any Ten Parts out of the following. Each Part carries equal marks.

- i. Why does the pipe of paper squeezes when air is blown through it?
- ii. Differentiate between free oscillations & forced oscillations.
- iii. Define the following.
a) Node b) Wave Length c) Ultrasonics d) Doppler Effect
- iv. State & explain Bragg's Law.
- v. Can specific heat of a gas be zero or infinity? Can specific heat be negative.
- vi. The energy of a Photon is $E=hf$. Find dimensions of plank's constant.
- vii. Are radians & Steradians the base units of SI justify your answer.
- viii. Define & explain briefly vector product of two vectors.
- ix. Show that change in momentum is equal to impulse.
- x. Define escape velocity & prove that $V_{esc} = \sqrt{2g R_e}$.
- xi. Why is the acceleration of a body moving uniformly in a circle, directed towards the center?
- xii. Define moment of force. On what factors does it depends.
- xiii. What is the angle for which the maximum height reached & corresponding range of projectile are equal.

SECTION "C"

Marks: 27

Note: Attempt any Three questions of the following. Each question carries equal Marks.

- III. (a) What are the effects of various factors on speed of sound in air. Explain 5
(b) A man of mass 85kg walks up to the third floor of a building. Which is 18m 4
above the ground in 30 sec. Find his power in watts & horse power.
- IV. (a) What is diffraction grating. How can the wave length of a beam of light be 5
measured with it?
(b) A cylinder of 60cm diameter at the top of an incline 45cm high & 15m long is 4
released and rolls down the incline. Find its linear & angular speeds at the bottom
of incline.
- V. (a) Define the molar heat capacities C_p & C_v for a gas. Show that for a mole of an 5
ideal Gas $C_p - C_v = R$.
(b) A mass at the end of a spring describe SHM with a period of 0.06 sec. Find the 4
acceleration when the displacement is 8cm.
- VI. (a) What is equation of continuity. Show that $V \propto \frac{1}{A}$. 5
(b) A constant force "F" changes the velocity of a 60kg sprinter from 5ms^{-1} to 7ms^{-1} 4
in 0.8 Sec. Calculate the acceleration of the sprinter.