PHYSICS Part-I	Paper Code	Roll No. of the Student
Time: 20 Minutes Marks: 18	① ② ●	Serial No. Of the Answer Book_____
Multiple Choice Questions 01 Mark for each		

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 Ⓐ/Ⓑ/Ⓒ/Ⓓ, 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 _____.

Ⓐ $2000C^o$ Ⓑ $3000C^o$ Ⓒ $4000C^o$ Ⓓ $5000C^o$

ii. The atmosphere is held to the earth by _____.

Ⓐ Clouds Ⓑ Gravity Ⓒ Winds Ⓓ Rotation of earth

iii. Relation between linear & angular acceleration is given by _____.

Ⓐ $\vec{r}\,\vec{\alpha}$ Ⓑ $\vec{r}\,w$ Ⓒ $-w^2r$ Ⓓ $-\vec{w}\,\vec{r}$

iv. The angular speed in radians per hours for daily rotation of our earth is _____.

Ⓐ $\pi/12$ Ⓑ 4π Ⓒ $\pi/6$ Ⓓ 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 _____.

Ⓐ V_t Ⓑ $\frac{Vt}{2}$ Ⓒ $4V_t$ Ⓓ $2V_t$

vi. In an inelastic collision, _____ is conserved.

Ⓐ P.E Ⓑ K.E Ⓒ Both KE & P.E Ⓓ Momentum

vii. Area under velocity time graph is called _____.

Ⓐ Speed Ⓑ Velocity Ⓒ Distance Traveled Ⓓ Acceleration

viii. For $/\vec{R}/=/\vec{F}_1/=/\vec{F}_2/$ then angle between $\vec{F}_1$ & $\vec{F}_2$ is _____.

Ⓐ 0^o Ⓑ 45^o Ⓒ 90^o Ⓓ 120^o

ix. If R_x is –ve & R_y is +ve then "Θ" lies in _____ quadrant.

Ⓐ 1^{st} Ⓑ 2^{nd} Ⓒ 3^{rd} Ⓓ 4^{th}

x. The number of significant figures in 0.000200kg are _____.

Ⓐ Two Ⓑ Three Ⓒ Four Ⓓ Six

xi. One "Tera" is equal to _____.

Ⓐ 10^{18} Ⓑ 10^{15} Ⓒ 10^{12} Ⓓ 10^9

xii. The SI unit of molar specific heat is _____.

Ⓐ $J.mole.k^{-1}$ Ⓑ $J.mole^{-1}.k$ Ⓒ $J.mole^{-1}.k^{-1}$ Ⓓ $mole.K^{-1}.J^{-1}$

xiii. The value of Joules constant J=_____.

Ⓐ 3.18 J/calorie Ⓑ 4.18 J/calorie Ⓒ 5 J/calorie Ⓓ 6.18 J/calorie

xiv. The effect produced to the super position of two coherent light waves is called _____.

Ⓐ Interference Ⓑ Polarization Ⓒ Refraction Ⓓ Diffraction

xv. The wave length of visible light is about _____.

Ⓐ 10^6m Ⓑ $10^{-6}cm$ Ⓒ $10^{-6}m$ Ⓓ 10^6cm

xvi. The theoritical value of speed of sound in a gas is _____ less than the experimental value.

Ⓐ 6% Ⓑ 16% Ⓒ 26% Ⓓ 20%

xvii. To make frequency double of a spring oscillation, we have to _____ the mass.

Ⓐ Double Ⓑ Half Ⓒ Quadruple Ⓓ Reduce to $\frac{1}{4}$

xviii. The device used to measure the rate of flow of liquid in pipe is called _____.

Ⓐ Venturi meter Ⓑ Calori meter Ⓒ Carburetor Ⓓ Spectrometer

PHYSCIS 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 $V_{esc} = \sqrt{2g\,Re}$.

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 mars 85kg walks up to the third floor of a building. Which is 18m above the ground in 30 sec. Find his power in watts & horse power. 4

IV. (a) What is diffraction grating. How can the wave length of a beam of light be measured with it? 5

(b) A cylinder of 60cm diameter at the top of an incline 45cm high & 15m long is released and rolls down the incline. Find its linear & angular speeds at the bottom of incline. 4

V. (a) Define the molar heat capacities C_p & C_v for a gas. Show that for a mole of an ideal Gas $C_p - C_v = R$. 5

(b) A mass at the end of a spring describe SHM with a period of 0.06 sec. Find the acceleration when the displacement is 8cm. 4

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 $7ms^{-1}$ in 0.8 Sec. Calculate the acceleration of the sprinter. 4