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

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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 $V_{esc} = \sqrt{2gR_e}$.

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 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