Sig. of Supdt.....

KT-XI-18-I
Physics (Part – I)
Fresh/Reappear

Roll No.....

Fic. No.....

14

Fic. No.....

Time allowed: 3 Hrs Code: 11 **Physics (Part – I)** **Marks: 85**

Fresh / Reappear

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. .....is the ratio $\frac{1-\mu n}{1Gm}$ [D]

A. 10^{-3} B. 10^{-9} C. 10^{-12} D. 10^{-15}

ii. $\left[LT^{-2}\right]$ is dimensions of ..... [C]

A. Torque B. Work C. Acceleration D. Velocity

iii. .....is the angle between $\vec{A}$ and $\vec{B}$ for which $|\vec{A}+\vec{B}|=|\vec{A}-\vec{B}|$? [D]

A. 30° B. 45° C. 60° D. 90°

iv. A projectile is thrown so that it travels a maximum range of 1000m. How high will it rise [B]

A. 500m B. 250m C. 400m D. 1000m

v. The expression for escape velocity is ..... [B]

A. $2gR^2$ B. $\sqrt{2gR}$ C. $\frac{gR^2}{2}$ D. 2gR

vi. The atmosphere is held to the earth by ..... [B]

a. Winds B. Gravity C. Clouds D. The rotation of earth

vii. Artificial satellite moves around ..... [B]

A. Moon B.Sun C. Stars D. Earth

viii. The smooth of steady steam – line flow is known as ..... [A]

A. Laminar flow B. Turbulent flow C. Both A & B D. None of these

ix. Bernoulli's equation is based upon law of conservation of ..... [C]

A. Mass B. Momentum C. Energy D. None

x. To make the frequency double of a spring oscillation, we have to ..... [A]

A. Reduce the mass to one fourth B. Quadruple the mass C. Doublet the mass D. Half the mass

xi. In an isolated system the total energy of vibrating mass and spring is ..... [D]

A. Variable B. Low C. High D. Constant

xii. Which one of the following properties is not exhibited by the longitudinal waves? [D]

A. Reflection B. Interference C. Diffraction D. Polarization

xiii. There is no net transfer of energy by particles of medium in ..... [D]

A. Longitudinal wave B. Transverse wave C. Progressive wave D. Stationary wave

xiv. Which one of the following properties proves the transverse wave nature of light? [C]

A. Interference B. Refraction C. Polarization D. Diffraction

xv. During a sunny day we see the objects in a class room even when all the electric are off due to [C]

A. Reflection of light B. Refraction of light C. Diffraction of light D. Interference of light

xvi. Two bodies are said to be in thermal equilibrium if they have the same ..... [A]

A. Temperature B. Amount of heat C. Specific heat D. Thermal capacities

xvii. Triple point of water is ..... [D]

A. 273.16°C B. 372.16°K C. 273.16°F D. 273.16°K

xviii. What is moment of inertia of a sphere? [C]

A. MR^2 B. $1/2MR^2$ C. $2/5\ MR^2$ D. $1/2\ M^2R$

Time: 2:40 Hours KT-XI-18-I

Physics (Part – I)

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Section "B" Marks: 40

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

i. Find the dimensions of kinetic energy.

ii. Explain why do buses and heavy trucks have large steering wheels?

iii. What is head – on collision? Explain with an example.

iv. A bucket is taken to the bottom of a well, does the bucket poses any potential energy explain.

v. Why energy savers are used instead of normal bulbs?

vi. Why fly wheel of an engine made heavy in the rim?

vii. A body will be weightless when the elevator falls down just like a free falling body. Explain

viii. Explain any two applications of Bernoulli's equation.

ix. When water falls from a tap, its cross sectional area decreases as it comes down. Explain why?

x. Explain why in S.H.M acceleration is zero when the velocity is greatest?

xi. The speed of a wave on a particular string is $24ms^{-1}$. If the string is 6m long to what driving frequency will it resonate?

xii. How would you justify that light waves are transverse?

xiii. What are the conditions for a process to be reversible?

Section "C" Marks: 27

Note: Answer any THREE questions. All questions carries equal marks.

Q.3 a. Define elastic and inelastic collisions. Drive mathematical equations for calculating the final velocities of the elasticity colliding bodies in one dimension.

b. Consider a ladder weighting 200N resulting against a smooth wall such that it make an angle of 60° with the horizontal. Find the reaction on the ladder due to the wall and ground.

Q.4 a. Show that in angular form, centripetal acceleration is $\vec{a_c} = -\omega^2 \vec{r}$

b. Water flows through a pipe whose internal diameter is 2cm at a speed of $1ms^{-1}$. What should be the diameter of the nozzle if the water is to emerge at a speed of $4ms^{-1}$?

Q.5 a. Explain the speed of sound in a gas and give all the factors which affect the speed of sound in the air?

b. A mass at the end of the spring describes S.H.M with T = 0.40sec. Find out $\vec{a}$ when displacement is 0.4cm.

Q.6 a. Explain the interference effect produced by thin film.

b. Find the efficiency of Carnot's heat engine working between the steam point and ice points.