Physics	(A)	L.K.No. 1009	Paper Code No. 6471
Paper I	(Objective Type)	Inter (Ist – A – Exam – 2023)	
Time :	20 Minutes	Inter (Part – I)	(Group Ist)
Marks :	17	Session (2020 – 22) to (2022 – 24)	

Note : Four possible choices A , B , C ,D to each question are given. Which choice is correct fill that circle in front of that Question No. Use Marker or Pen to fill the circles. Cutting or filling two or more circles will result in Zero Mark in that Question.

Bwp-11-1-23

Q.No.1 (1)	Physical Quantities are divided into ---------- Categories :	(A) = 1 (B) = 2 (C) = 3 (D) = 4
(2)	Dimension of Force is :	(A) ML^{-2} (B) MLT^{-2} (C) $ML^{-1}T$ (D) MLT^{2}
(3)	A + (−A) = :	(A) 2A (B) A (C) 0 (D) − 1
(4)	$\hat{i}.\hat{i} = \hat{j}.\hat{j} = \hat{k}.\hat{k}$ = :	(A) 1 (B) 0 (C) −1 (D) None of these
(5)	Acceleration " a " of the Rocket is :	(A) $\frac{Mv}{m}$ (B) $\frac{mv}{m}$ (C) $\frac{mv}{M}$ (D) $\frac{Mm}{v}$
(6)	Height of Projectile is h = :	(A) $\frac{V_i Sin^2\theta}{2g}$ (B) $\frac{V_{i^2} Sin\theta}{g}$ (C) $\frac{V_i Sin\theta}{g}$ (D) $\frac{V_{i^2} Sin^2\theta}{2g}$
(7)	No work is done when θ = :	(A) 0^o (B) 180^o (C) 90^o (D) 360^o
(8)	1 rad = :	(A) $\frac{2\pi}{360^o}$ (B) $\frac{360^o}{2\pi}$ (C) $\frac{2\pi}{3}$ (D) $57^o\pi$
(9)	When the lift is moving upward with an Acceleration " a " then tension in string is :	(A) w + ma (B) w + ma^2 (C) ma − w (D) w − ma
(10)	The Mass of Droplet is :	(A) $\frac{\rho}{v}$ (B) $\frac{v}{\rho}$ (C) ρV (D) $2\rho V$
(11)	Time Period of Pendulum is T = :	(A) $2\pi\sqrt{\frac{l}{g}}$ (B) $\sqrt{\frac{2\pi l}{g}}$ (C) $2\pi\sqrt{\frac{g}{\rho}}$ (D) $2g\sqrt{\frac{\pi}{\rho}}$
(12)	Laplace Expression for the speed of sound in Gas is V = :	(A) $\sqrt{\frac{v\gamma}{p}}$ (B) $\sqrt{\frac{\gamma P}{\rho}}$ (C) $\rho\sqrt{\frac{\gamma}{p}}$ (D) $\gamma\sqrt{\frac{\rho}{p}}$
(13)	In the Fundamental Note, the distance between Anode and Antinode is :	(A) $\ell = \frac{\lambda_1}{4}$ (B) $\ell = \frac{4\lambda_1}{2}$ (C) $\ell = \frac{\lambda_1}{2}$ (D) $\ell = 2\lambda$
(14)	The distance between two adjacent dark fringes can be proved to be : :	(A) $\frac{\lambda L}{d}$ (B) $\frac{\lambda d}{L}$ (C) $\frac{Ld}{\lambda}$ (D) $\frac{\lambda L}{d}$
(15)	Angular Magnification is defined as M = :	(A) $\frac{\alpha}{\beta}$ (B) $\frac{\beta}{\alpha}$ (C) $\alpha\beta$ (D) $\alpha^2\beta^2$
(16)	In Charles's Law, the constant is :	(A) *Pressure* (B) Temperature (C) *Volume* (D) Density
(17)	Entropy of the Universe is always :	(A) Remain Constant (B) Increases (C) Decreases (D) Always Zero

Roll No.	1009 - 25000	Inter (Part – I)	Session (2020 –22) to (2022 – 24)
Physics (Subjective)	Inter (Ist – A– Exam – 2023)	Group Ist	Time 2 : 40 Hours Marks : 68

Note : It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2, Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part – II .Write the Same Question Number and its Part Number as given in the Question Paper

Make Diagram where necessary. | Part - I | BWP-11-1-23 | 22 x 2 = 44

Q.No.2	(i)	Name several repetitive phenomenon occurring in nature which could serve as reasonable time standard.
	(ii)	Write the dimensions of : (a) Pressure (b) Density
	(iii)	Show that the expression $V_f = V_i + at$ is dimensionally correct.
	(iv)	Define and explain significant figures.
	(v)	Two vectors have unequal magnitudes. Can their sum be zero ? Explain.
	(vi)	Name the three different conditions that could make $\vec{A_1} \times \vec{A_2} = \vec{0}$
	(vii)	Write down the steps for addition of vectors by rectangular component method.
	(viii)	Explain the circumstances in which the velocity $\vec{v}$ and acceleration $\vec{a}$ of a car are : (a) Parallel (b) Perpendicular to one another
	(ix)	At what point or points in its path does a projectile have its minimum speed , its maximum speed ?
	(x)	What is an Inertial Frame of Reference ?
	(xi)	The Horizontal Range of a projectile is four times of its maximum height. What is the angle of projection ?
	(xii)	Explain how the swing is produced in a fast moving cricket ball ?
Q.No.3	(i)	Calculate the loss in work done when angle between force and displacement is changed from 0° to 60°.
	(ii)	A 70 Kg man runs up a long flight of stairs in 4 . 0 seconds. The vertical height of the stairs is 4 . 5 m . Calculate the power output in watts.
	(iii)	A girl drops a cup from a certain height which breaks into pieces. What energy changes are involved ?
	(iv)	How would you generate a plan to create artificial gravity in a space station ?
	(v)	Why does a diver change his body positions before and after diving in the pool ?
	(vi)	When Mud Flies off the tyre of a moving bicycle, in what direction does it fly ? Explain.
	(vii)	What is Sharpness of Resonance ? Give its purpose.
	(viii)	Name two characteristics of S.H.M.
	(ix)	Can we realize an Ideal Simple Pendulum?
	(x)	Differentiate between Red Shift and Blue Shift for a moving star.
	(xi)	Why sound travels faster in Warm Air than in Cold Air ? Support your answer by proper reasoning.
	(xii)	How should a sound source move with respect to an observer so that the frequency of its sound does not change ?
Q.No.4	(i)	Define Interference and Diffraction of Light.
	(ii)	An Oil Film spreading over a wet footpath shows colours. Explain how does it happen ?
	(iii)	Why the Polaroid sun glasses are better than ordinary sun glasses ?
	(iv)	Distinguish between Magnifying Power and Resolving Power.
	(v)	One can buy a cheap Microscope for use of Children. The images seen in such a Microscope have coloured edges. Why is this so ?
	(vi)	State First Law of Thermodynamics and give its formula.
	(vii)	What is a Heat Engine ? Write formula for its efficiency.
	(viii)	A Thermos Flask containing milk as a system is shaken rapidly. Does the temperature of milk rise ?
	(ix)	Can the Mechanical Energy be converted completely into heat energy ? If so give an example.

(Part - II) (3 x 8 = 24)

Q.No.5	(a)	Define Scalar Product of Two Vectors. Write down the characteristics of Scalar Product of two vectors.	(5)
	(b)	A brick of mass 2 . 0 Kg is dropped from a rest position 5 . 0 m above the ground. What is its velocity at a height of 3 . 0 m above the ground ?	(3)
Q.No.6	(a)	Explain Elastic Collision in One Dimension to prove that magnitude of Relative Velocity of approach is equal to the magnitude of the relative velocity of separation and also write the equations of V_1' and V_2'.	(5)
	(b)	A Gramophone record turntable accelerate from rest to an angular velocity of 45 . 0 rev min^{-1} in 1 . 60 s . What is its Average Angular Acceleration ?	(3)
Q.No.7	(a)	Define Molar Specific Heat of a Gas and derive relation between them.	(5)
	(b)	What Gauge Pressure is required in the city main for a stream from a fire hose connected to the mains to reach a vertical height of 15 . 0 m ?	(3)
Q.No.8	(a)	Define and explain the phenomena of Resonance. Also give examples where Resonance plays an important role.	(5)
	(b)	The frequency of the note emitted by a Stretched String is 300 Hz. What will be the frequency of this note when the tension is increased by One – Third without changing the length of the wire ?	(3)
Q.No.9	(a)	Describe principle , construction and working of Michelson's Interferometer.	(5)
	(b)	An Astronomical Telescope having power of 5 consists of two thin lenses 24 cm apart. Find the Focal length of	(3)