



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	Physical Quantities are divided into ----- Categories :
(1)	(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)	$\hat{i} \cdot \hat{i} = \hat{j} \cdot \hat{j} = \hat{k} \cdot \hat{k} =$: (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) $\frac{V_1 \sin^2 \theta}{2g}$ (B) $\frac{V_1^2 \sin \theta}{g}$ (C) $\frac{V_1 \sin \theta}{g}$ (D) $\frac{V_1^2 \sin^2 \theta}{2g}$
(7)	No work is done when $\theta =$: (A) 0° (B) 180° (C) 90° (D) 360°
(8)	1 rad = : (A) $\frac{2\pi}{360^\circ}$ (B) $\frac{360^\circ}{2\pi}$ (C) $\frac{2\pi}{3}$ (D) $57^\circ \pi$
(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) $l = \frac{\lambda_1}{4}$ (B) $l = \frac{4\lambda_1}{2}$ (C) $l = \frac{\lambda_1}{2}$ (D) $l = 2\lambda$
(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



B



Roll No.	1009 - 25000	Inter (Part - I)	Session (2020-22) to (2022-24)
Physics (Subjective)	Inter (1st - A - Exam - 2023)	Group 1st	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?	(5)
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' .	(3)
	(b)	A Gramophone record turntable accelerate from rest to an angular velocity of $45.0 \text{ rev min}^{-1}$ in 1.60 s. What is its Average Angular Acceleration?	(5)
Q.No.7	(a)	Define Molar Specific Heat of a Gas and derive relation between them.	(3)
	(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?	(5)
Q.No.8	(a)	Define and explain the phenomena of Resonance. Also give examples where Resonance plays an important role.	(3)
	(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?	(5)
Q.No.9	(a)	Describe principle, construction and working of Michelson's Interferometer.	(3)
	(b)	An Astronomical Telescope having power of 5 consists of two thin lenses 24 cm apart. Find the focal lengths of the lenses.	(5)



Physics	(A)	L.K.No. 1010	Paper Code No. 6472
Paper I	(Objective Type)	Inter (Ist - A - Exam - 2023)	
Time :	20 Minutes	Inter (Part - I)	(Group 2 nd)
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-11-2-23

Q.No.1	The percentage uncertainty in radius of a circle is 3%. The total percentage uncertainty in the area of a circle is :	(A) 4% (B) 3% (C) 6% (D) 9%
(2)	The Dimensions of $\frac{1}{2} \rho v^2$ are :	(A) $[ML^{-1}T^{-2}]$ (B) $[M^0L^2T^{-2}]$ (C) $[ML^{-3}]$ (D) $[ML^2T^{-2}]$
(3)	A Force of 10 N makes an angle of 60° with y-axis, its y-component is :	(A) $5\sqrt{3}$ N (B) 8.66 N (C) 10 N (D) 5 N
(4)	If $\vec{A} \times \vec{B}$ points along negative z-axis, the vector \vec{A} and \vec{B} must lie in :	(A) y-z Plane (B) y-x Plane (C) x-y Plane (D) z-x Plane
(5)	Inertia may expressed in S.I. :	(A) Kg (B) Newton (C) Watt (D) Joule
(6)	Which theory is better about Gravitation :	(A) Newton (B) Plank's (C) Huygen's (D) Einstein's
(7)	In the absence of External Force, the impulse of a body is :	(A) Constant (B) Maximum (C) Zero (D) Minimum
(8)	The escape velocity of a 30 Kg object from the Earth's Surface is about :	(A) 22 Kms ⁻¹ (B) 11 Kms ⁻¹ (C) 330 Kms ⁻¹ (D) 30 Kms ⁻¹
(9)	Angular Displacement covered by Earth around the sun in one year is about :	(A) π Radian (B) $\frac{\pi}{2}$ Radian (C) $\frac{\pi}{4}$ Radian (D) 2π Radian
(10)	The terminal velocity of fog droplet in air is :	(A) Zero (B) Large (C) Very Small (D) Medium
(11)	A Swing is a good example of :	(A) Mechanical Resonance (B) Chemical Resonance (C) Electrical Resonance (D) Doppler Effect
(12)	According to Laplace Equation the speed of Sound in Polyatomic Gas at S.T.P is about :	(A) 362 ms ⁻¹ (B) 318 ms ⁻¹ (C) 333 ms ⁻¹ (D) 340 ms ⁻¹
(13)	In Michelson's Interferometer one fringe is count when mirror M_1 is displaced by :	(A) λ (B) $\frac{\lambda}{4}$ (C) $\frac{\lambda}{8}$ (D) $\frac{\lambda}{2}$
(14)	The resolving power of a compound Microscope increases when we use :	(A) White Light (B) Red Light (C) Blue Light (D) Yellow Light
(15)	The sound of Frequency lower than 20 Hz is called :	(A) Infra Sonic (B) Super Sonic (C) Sonic (D) Ultra Sonic
(16)	In Thermodynamics, Internal Energy of a Gas Molecules is independent of :	(A) Initial State (B) Final State (C) Path Followed (D) All of these
(17)	The efficiency of a Carnot Engine when the temperature of the Sink is 0 K :	(A) 100 % (B) 80 % (C) Highest Efficiency (D) 50 %



B



Roll No.	1010 - 25000	Inter (Part - I)	Session (2020 - 22) to (2022 - 24)
Physics (Subjective)	Inter (1st - A - Exam - 2023)	Group 2nd	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-11-2-23

22 x 2 = 44

Q.No.2	(i)	Give the drawbacks to use the period of Pendulum as a Time Standard.
	(ii)	Does a Dimensional Analysis give any information on constant of proportionality that may appear in an Algebraic Expression? Explain.
	(iii)	How many Radians account for circumference of a circle? How many Steradians account for surface area of a sphere?
	(iv)	Differentiate between Precision and Accuracy.
	(v)	Two Vectors have unequal magnitudes. Can their sum be zero? Explain.
	(vi)	Can a body rotate about its centre of Gravity under the action of its weight?
	(vii)	What units are associated with unit vectors \hat{i} , \hat{j} and \hat{k} ?
	(viii)	An object is thrown vertically upwards. Discuss the sign of Acceleration due to Gravity, Relative to Velocity while the object is in air?
	(ix)	Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Discuss.
	(x)	A Projectile is fired at 45° with the Horizontal. Show that Range = 4 x Vertical Height
	(xi)	What are the signs of Velocity and Acceleration when the object is speeding up?
	(xii)	Explain the difference between Laminar Flow and Turbulent Flow.
Q.No.3	(i)	Calculate the work done in Kilo Joules in lifting a mass of 10 Kg (at a steady velocity) through a vertical height of 10 m.
	(ii)	A person holds a bag of Groceries while standing still, talking to a friend. A car is stationary with its engine running. From the stand point of work, how are these two situations similar?
	(iii)	Define Power and give its unit.
	(iv)	When Mud Flies Off the tyre of a moving bicycle, in what direction does it fly? Explain.
	(v)	Explain what is meant by Centripetal Force and why it must be furnished to an object if the object is to follow a circular path?
	(vi)	Write equations of Angular Motion.
	(vii)	Show that in SHM the Acceleration is zero when the velocity is greatest and the velocity is zero when the Acceleration is greatest.
	(viii)	Can we realize an Ideal Simple Pendulum?
	(ix)	Why the Soldiers are advised to break their steps while marching on a bridge?
	(x)	How are beats useful in tuning musical instruments?
	(xi)	What features do longitudinal waves have in common with transverse waves?
	(xii)	Why Radar cannot detect under water object?
Q.No.4	(i)	Can Visible Light produce Interference Fringes? Explain.
	(ii)	What is meant by Optically Active Crystals?
	(iii)	Under what conditions two or more sources of light behave as Coherent Sources?
	(iv)	Write down the importance of Collimator in Spectrometer.
	(v)	What do you understand by Linear and Angular Magnification? Explain how a Convex Lens is used as Magnifier?
	(vi)	Why does the pressure of a Gas in a car tyre increase when it is driven through some distance?
	(vii)	Specific Heat of a Gas at constant pressure is greater than Specific Heat at Constant Volume, why?
	(viii)	Can we say that First Law of Thermodynamics is Law of Conservation of Energy? Explain briefly.
	(ix)	Define Adiabatic Process. Give at least two examples.

(Part - II)

(3 x 8 = 24)

Q.No.5	(a)	Define and explain Torque. Calculate the Torque due to Force acting on a rigid body.	(5)
	(b)	A 70 Kg man runs up a long flight of stairs in 4.0 s. The Vertical height of the stairs is 4.5 m. Calculate his power output in watts.	(3)
Q.No.6	(a)	What are Geo-stationary Orbits and Geo-stationary Satellites? Find the Orbital Radius of Geo-stationary Satellites.	(5)
	(b)	A football is thrown upward with an angle of 30° with respect to the horizontal. To throw a 40 m pass what must be the initial speed of the ball?	(3)
Q.No.7	(a)	What are the applications of Bernoulli's Equation?	(5)
	(b)	A Heat Engine perform 100 J of work and at the same time rejects 400 J of Heat energy to the cold reservoirs. What is the efficiency of the Engine?	(3)
Q.No.8	(a)	Define and explain the phenomena of Resonance. Also give examples where Resonance plays an important role.	(5)
	(b)	What should be the length of a Simple Pendulum whose period is 1.0 Second at a place where $g = 9.8 \text{ ms}^{-2}$? What is the frequency of such a pendulum?	(3)
Q.No.9	(a)	What is an Astronomical Telescope? Describe its construction and working. Also calculate its magnifying Power.	(5)
	(b)	In a Double Slit Experiment, the second order maximum occurs at $\theta = 0.25^\circ$. The Wavelength is 650 nm. Determine the Slit Separation.	(3)

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