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 2nd)
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 (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^o 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 %

Roll No.	1010 - 25000	Inter (Part – I)	Session (2020 –22) to (2022 – 24)
Physics (Subjective)	Inter (Ist – 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^{o} 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^{o} 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 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 $\theta = 0.25^{o}$ The Wavelength is 650 nm. Determine the Slit Separation.	(3)

X X X X X