



Physics	(A)	L.K.No. 1529	Paper Code No. 6471
Paper I	(Objective Type)	Inter ( Ist - A - Exam - 2024 )	
Time :	20 Minutes	Inter ( Part - I )	( Group Ist )
Marks :	17	Session (2022 - 24) & (2023 - 25)	

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

Q.No.1	The main frontiers of fundamental Science are :
(1)	(A) 1 (B) 2 (●) 3 (D) 4
(2)	The sum of three numbers 2 . 7543 , 4 . 10 and 1 . 273 upto correct decimal place is : (A) 8 . 12 (●) 8 . 13 (C) 8 . 127 (D) 8 . 1273
(3)	The vector $\vec{A} = \frac{1}{\sqrt{2}} \hat{i} + \frac{1}{\sqrt{2}} \hat{j}$ is a : (A) Null Vector (●) Unit Vector (C) Vector of magnitude $\sqrt{2}$ (D) Vector of magnitude $\frac{1}{\sqrt{2}}$
(4)	If $ \vec{A} \cdot \vec{B}  =  \vec{A} \times \vec{B} $ then angle between vectors $\vec{A}$ and $\vec{B}$ is : (A) 0 (●) $\frac{\pi}{4}$ (C) $\frac{\pi}{2}$ (D) $\pi$
(5)	The Momentum and Kinetic Energy of a body having the same value at the speed of : (A) $8 \text{ ms}^{-1}$ (B) $1 \text{ ms}^{-1}$ (C) $4 \text{ ms}^{-1}$ (●) $2 \text{ ms}^{-1}$
(6)	Motion of Projectile is : (A) One Dimensional (●) Two Dimensional (C) Three Dimensional (D) Four Dimensional
(7)	Tidal Energy is due to Gravitational Pull of : (●) Moon (B) Sun (C) Earth (D) Mars
(8)	The relation for Moment of Inertia of the thin ring is : (●) $mr^2$ (B) $\frac{1}{2} mr^2$ (C) $\frac{2}{5} mr^2$ (D) $\frac{2}{3} mr^2$
(9)	The Unit of Rotational K.E is : (A) $\text{rad s}^{-1}$ (B) Js (●) J (D) $\text{Kg m}^2$
(10)	Stoke 's Law hold for bodies when they have : (●) Spherical Shape (B) Curved Shape (C) Rectangular Shape (D) Triangle Shape
(11)	Time Period of Simple Pendulum only depends on : (A) Mass (●) Length (C) Amplitude (D) Displacement
(12)	If the path difference between two waves is $\frac{\lambda}{2}$ then Interference will be : (●) Constructive (B) Destructive (C) Beats (D) Both A and B
(13)	The maximum value of beat frequency is : (●) 10 Hz (B) 100 Hz (C) 20 Hz (D) 30 Hz
(14)	The effective path difference between two x-ray beams reflected from a crystal plane is : (A) $d \sin \theta$ (B) $\frac{d}{2} \sin \theta$ (●) $2d \sin \theta$ (D) $\frac{2 \sin \theta}{d}$
(15)	Using the relation for Magnification Power $M = 1 + \frac{d}{f}$ if $f = 5 \text{ cm}$ and $d = 25 \text{ cm}$ then M will be : (A) 4 (B) 5 (●) 6 (D) 7
(16)	When Ice melts , entropy : (●) Increases (B) Decreases (C) Constant (D) Zero
(17)	For the Isothermal Process , the first Law of Thermodynamics can be written as : (A) $Q = \Delta U + w$ (B) $Q = \Delta U$ (C) $Q = -\Delta U$ (●) $Q = W$







Roll No.	1529 -	Inter (Part - I)	Session (2022-24) & (2023-25)
Physics (Subjective)	Inter (1st - A- Exam - 2024)	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

Bahawalpur Board-G-1-2024

Make Diagram where necessary.

Part - I

22 x 2 = 44

Q.No.2	(i)	The length and width of a rectangular plate are 15.3cm and 12.80cm respectively. Find the area of the plate upto correct significant figures.
	(ii)	Give the drawbacks to use the period of a pendulum as a time standard.
	(iii)	Name several repetitive phenomenon occurring in nature which could serve as reasonable time standards.
	(iv)	Why do we find it useful to have two units for the amount of substance , the Kilogram and the Mole?
	(v)	If Force of magnitude 20N makes an angle of $30^\circ$ with x - axis then find its y - component?
	(vi)	Can you add zero to a Null vector?
	(vii)	Two vectors have unequal magnitudes . Can their sum be zero? Explain.
	(viii)	Define Impulse and show how it is related to Linear Momentum?
	(ix)	At what point or points in its path does a projectile have its minimum speed , its maximum speed?
	(x)	Does the man can jump high on the surface of moon as compare to earth ? Explain.
	(xi)	An object has 1 J of Potential Energy . Explain what does it mean?
	(xii)	What is meant by work done by a constant force?
Q.No.3	(i)	Show that Orbital Angular Momentum $L_0 = mvr$
	(ii)	When mud flies off the tyre of a moving bicycle , in what direction does it fly? Explain.
	(iii)	What is meant by Moment of Inertia? Explain its significance.
	(iv)	What are directions of Angular Momentum and Angular Velocity?
	(v)	Explain the term Viscosity.
	(vi)	Explain how swing is produced in a fast moving Cricket Ball?
	(vii)	Can we realize an Ideal Simple Pendulum?
	(viii)	Explain Damping with an example.
	(ix)	For SHM , explain the equations : (a) $y = A \sin (\omega t + \phi)$ (b) $a = -\omega^2 x$
	(x)	Explain how sound travel faster in warm air than in cold air ?
	(xi)	Explain the terms Crest , Trough , Node and Antinode.
	(xii)	Which Phenomenon is used to detect the motion of an aeroplane in a radar?
Q.No.4	(i)	Why the Polaroid sun glasses are better than ordinary sun glasses?
	(ii)	Why x-rays cannot be diffracted by diffraction grating ?
	(iii)	It is impossible to get phase Coherent beam of light from two separate sources of light . Why?
	(iv)	A magnifying glass gives a five times enlarged image at a distance of 25 cm from the lens . Find the Focal Length of the Lens .
	(v)	Why multimode graded index fiber is better for long distances than multimode step index Fiber?
	(vi)	What are the conditions necessary for the total internal reflection to take place?
	(vii)	Under what condition the efficiency of a Carnot Engine will be 100% ?
	(viii)	Is it possible to Construct a Heat Engine that will not expel heat into the atmosphere ? Explain.
	(ix)	When 50 J of heat enter into a system and 20 J of work is done by the system. What will be the change in internal energy of the system?

( Part - II )



3 x 8 = 24

Q.No.5	(a)	What is Elastic Collision ? In case of Elastic Collision of two bodies in one dimension , write their velocities after Collision.	(5)
	(b)	Find the Projection of vector $\vec{A} = 2\hat{i} - 8\hat{j} + \hat{k}$ in the direction of the vector $\vec{B} = 3\hat{i} - 4\hat{j} - 12\hat{k}$ .	(3)
Q.No.6	(a)	What assumptions are made by Laplace to calculate speed of sound in air?	(5)
	(b)	A man pushes a lawn mower with a 40 N Force directed at an angle of $20^\circ$ downward from the horizontal. Find the work done by the man as he cuts a strip of grass 20 m long .	(3)
Q.No.7	(a)	How would you analyse Moment of Inertia with mass distribution and orientation ? Also derive its formula for a rigid body.	(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.8	(a)	What is Carnot Engine ? Explain its working and calculate its efficiency.	(5)
	(b)	Water flows through a hose, whose internal diameter is 1 cm at a speed of $1 \text{ ms}^{-1}$ . What should be the diameter of the nozzle if the water is to emerge at $21 \text{ ms}^{-1}$ .	(3)
Q.No.9	(a)	What is Simple Microscope ? Derive relation for its Magnifying Power.	(5)
	(b)	In a double slit experiment , the second order maximum occurs at $\theta = 0 . 25^\circ$ . The Wavelength is 650nm . Determine the slit separation.	(3)





Physics	(C)	L.K.No.1530	Paper Code No. 6476
Paper I	(Objective Type)	Inter ( Ist – A – Exam – 2024 )	
Time :	20 Minutes	Inter ( Part – I )	Group 2 <sup>nd</sup>
Marks :	17	Session (2022 – 24) & (2023 – 25)	

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

Q.No.1	A Paratrooper having :	
(1)	<input checked="" type="radio"/> Dynamic Equilibrium (B) Static Equilibrium (C) Acceleration (D) Zero Velocity	
(2)	$\text{Kg m}^2 \text{ s}^{-2}$ is the unit of : (A) Work (B) Force (C) Moment of Force <input checked="" type="radio"/> Both A and C	
(3)	The sum of $2.7342$ , $2.3$ , $1.432$ and $5.32$ upto the correct decimal place is : (A) $11.78$ <input checked="" type="radio"/> $11.8$ (C) $11.786$ (D) $11.7862$	
(4)	The angle between two vectors $2\hat{i} - 3\hat{j}$ and $3\hat{k}$ is : (A) $30^\circ$ <input checked="" type="radio"/> $90^\circ$ (C) $60^\circ$ (D) $0^\circ$	
(5)	Tidal Energy is due to Gravitational Pull of : <input checked="" type="radio"/> Moon (B) Sun (C) Earth (D) Mars	
(6)	Acceleration of $1.5 \text{ ms}^{-2}$ expressed in $\text{Km Hour}^{-2}$ is : (A) $324 \text{ Km Hour}^{-2}$ <input checked="" type="radio"/> $19440 \text{ Km Hour}^{-2}$ (C) $5400 \text{ Km Hour}^{-2}$ (D) $4 \text{ Km Hour}^{-2}$	
(7)	Distance covered by a freely falling body in 2 sec will be : (A) $4.9 \text{ m}$ (B) $29.2 \text{ m}$ (C) $19.6 \text{ m}$ <input checked="" type="radio"/> $44.1 \text{ m}$	
(8)	A man in an elevator descending with deacceleration will conclude that his apparent weight has : (A) Increased <input checked="" type="radio"/> Decreased (C) Remain Constant (D) Reduced to Zero	
(9)	When the bob of Simple Pendulum is at its dynamic equilibrium position, it has : <input checked="" type="radio"/> K.E (B) P.E and K.E (C) P.E (D) Both A and B	
(10)	A two meter high tank containing water is hit by two bullets of same caliber at $1.5 \text{ m}$ and $1 \text{ m}$ above the ground, the speed of efflux is maximum for : <input checked="" type="radio"/> $1 \text{ m}$ (B) $1.5 \text{ m}$ (C) $0.5 \text{ m}$ (D) $0.3 \text{ m}$	
(11)	$100^\circ$ is equal to : <input checked="" type="radio"/> $1.7 \text{ rad}$ (B) $16.5 \text{ rad}$ (C) $1.82 \text{ rad}$ (D) $1.75 \text{ rad}$	
(12)	The distance from first antinode to 7 <sup>th</sup> node is equal to : (A) $\frac{10\lambda}{2}$ (B) $3\lambda$ <input checked="" type="radio"/> $\frac{11\lambda}{4}$ (D) $7\lambda$	
(13)	The infrared light emitted from LED has a Wavelength : <input checked="" type="radio"/> $1.3 \mu\text{m}$ (B) $1.23 \mu\text{m}$ (C) $1.38 \mu\text{m}$ (D) $1 \mu\text{m}$	
(14)	The spacing between two adjacent dark fringes is : (A) $\frac{\lambda L}{2d}$ <input checked="" type="radio"/> $\frac{\lambda L}{d}$ (C) $\frac{n\lambda}{d}$ (D) $\frac{2L}{d}$	
(15)	The Wavelength of the fundamental mode of vibration of a closed end pipe is : (A) $2\ell$ (B) $\ell$ (C) $\ell/2$ <input checked="" type="radio"/> $4\ell$	
(16)	When the temperature difference between source and sink is Constant, then the efficiency will be : (A) Smaller <input checked="" type="radio"/> Remain Same (C) Greater (D) Zero	
(17)	The Entropy of sand in a desert at night time will be : <input checked="" type="radio"/> Increases (B) Zero (C) Constant (D) Decreases	





Roll No.	1530 - 22000	Inter (Part - I)	Group 2 <sup>nd</sup>
Physics (Subjective)	Inter (1st - A - Exam - 2024)	Time 2 : 40 Hours Marks : 68	Session (2022 - 24) & (2023 - 25)

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.

Bahawalpur Board-G-2-2024

Make Diagram where necessary.

(Part - I)

22 x 2 = 44

Q.No.2	(i)	Two sides of a rectangle are 15 . 3 cm and 12 . 80 cm . Find the area of the plate.
	(ii)	What is a Light Year?
	(iii)	Write the dimensions of : (i) Pressure (ii) Density .
	(iv)	Time Period of a Simple Pendulum is measured by a Stop Watch. What type of errors are possible in the Time Period?
	(v)	If $\vec{A} - \vec{B} = \vec{0}$ , what can you say about the components of the two vectors?
	(vi)	Can you add zero to a Null Vector?
	(vii)	Name three different conditions that could make $\vec{A}_1 \cdot \vec{A}_2 = 0$
	(viii)	What is the difference between Uniform and Variable Velocity? Define Acceleration.
	(ix)	How Force and Momentum are related to each other?
	(x)	Calculate Time of Flight in case of a Projectile.
	(xi)	How Power and Velocity are related to each other?
	(xii)	What energy changes are involved when a cup breaks into pieces?
Q.No.3	(i)	What is meant by Angular Momentum? Explain the Law of Conservation of Angular Momentum.
	(ii)	Explain how many minimum number of Geo-Stationary Satellite are required for Global Coverage of T.V. Transmission.
	(iii)	Differentiate between Tangential Velocity and Angular Velocity.
	(iv)	Prove that $v = r\omega$
	(v)	Explain the difference between Laminar Flow and Turbulent Flow.
	(vi)	Define Viscosity and Drag Force.
	(vii)	What is meant by Phase Angle? Does it define angle between maximum displacement and the driving Force?
	(viii)	Find the Time Period of Simple Pendulum , if the value of 'g' increases by 2 times.
	(ix)	What do you mean by Damping ?
	(x)	How are Beats Useful in Tuning musical Instruments ?
	(xi)	Explain the terms Crest , Trough , Node and Antinode.
	(xii)	What is the effect of temperature on Speed of Sound ? Explain .
Q.No.4	(i)	How would you manage to get more orders of Spectra using a diffraction grating?
	(ii)	Write two uses of Michelson's Interferometer.
	(iii)	10,000 lines Per Centimeter has been ruled on a diffraction grating. Find its Grating Element.
	(iv)	How the light signal is transmitted through the Optical Fibre?
	(v)	What are the uses of Spectrometer?
	(vi)	Find Magnifying Power of Convex Lens of 25cm Focal Length acts as a magnifying glass.
	(vii)	Why does the pressure of a gas in a car tyre increases when it is driven through same distance?
	(viii)	Give an example of natural process that involves an increase in Entropy.
	(ix)	Derive Boyle's Law from Kinetic Theory of Gases.

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(Part - II)

3 x 8 = 24

Q.No.5	(a)	When a ball is thrown with some initial velocity $V_1$ making an angle $\theta$ with the horizon . Discuss its Motion . Also derive relation for Height , Time of Flight and Range.	(5)
	(b)	What is the Unit Vector in the direction of Vector $\vec{A} = 4\hat{i} + 3\hat{j}$ ?	(3)
Q.No.6	(a)	Define Conservative Field and prove that work done is independent of the path followed by the body in Gravitational Field.	(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 length of the wave is reduced by one-third without changing the tension?	(3)
Q.No.7	(a)	What is Simple Pendulum ? Show that the motion of Pendulum is S.H.M . Also find relation for its Time Period and Frequency.	(5)
	(b)	What is the least speed at which an Aeroplane can execute a vertical loop of 1 . 0 Km radius so that there will be no tendency for the pilot to fall down at the highest point?	(3)
Q.No.8	(a)	State and Prove equation of Continuity $A_1V_1 = A_2V_2$ .	(5)
	(b)	A Heat Engine performs 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.9	(a)	Describe in detail the construction and working of Michelson's Interferometer.	(5)
	(b)	A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least $39^\circ$ . What is the minimum angle for total internal reflection if pipe is in water. ( Refractive Index of water = 1 . 33 ) .	(3)





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.

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) $0^\circ$ (B) $180^\circ$ (C) $90^\circ$ (D) $360^\circ$	
(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) $\rho V$ (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) $\sqrt{\frac{vY}{p}}$ (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 (1st - 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

**Bahawalpur Board-2023**

Make Diagram where necessary.

Part - I

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 $0^\circ$ to $60^\circ$ .
	(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 $45.0 \text{ rev min}^{-1}$ 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.	(5)





<b>Physics</b>	<b>(A)</b>	<b>L.K.No. 1010</b>	<b>Paper Code No. 6472</b>
<b>Paper I</b>	<b>( Objective Type )</b>	<b>Inter ( Ist – A – Exam – 2023 )</b>	
<b>Time :</b>	<b>20 Minutes</b>	<b>Inter ( Part – I )</b>	<b>( Group 2<sup>nd</sup> )</b>
<b>Marks :</b>	<b>17</b>	<b>Session (2020 – 22) to (2022 – 24)</b>	

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.

### Bahawalpur Board-2023

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 $60^\circ$ 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 <sup>-1</sup> (B) 11 Kms <sup>-1</sup> (C) 330 Kms <sup>-1</sup> (D) 30 Kms <sup>-1</sup>
(9)	Angular Displacement covered by Earth around the sun in one year is about :	(A) $\pi$ Radian (B) $\frac{\pi}{2}$ Radian (C) $\frac{\pi}{4}$ Radian (D) $2\pi$ 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 <sup>-1</sup> (B) 318 ms <sup>-1</sup> (C) 333 ms <sup>-1</sup> (D) 340 ms <sup>-1</sup>
(13)	In Michelson's Interferometer one fringe is count when mirror M <sub>1</sub> is displaced by :	(A) $\lambda$ (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.</b>	<b>1010 - 25000</b>	<b>Inter (Part - I)</b>	<b>Session (2020 - 22 ) to (2022 - 24)</b>
<b>Physics (Subjective)</b>	<b>Inter ( 1st - A- Exam - 2023 )</b>	<b>Group 2nd</b>	<b>Time 2 : 40 Hours Marks : 68</b>

**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

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 $45^\circ$ 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 $30^\circ$ 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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D





<b>Physics</b>	<b>(B)</b>	<b>L.K.No. 1107</b>	<b>Paper Code No. 6473</b>
<b>Paper I</b>	<b>( Objective Type )</b>	<b>Inter – A – 2022</b>	<b>( Group Ist )</b>
<b>Time :</b>	<b>20 Minutes</b>	<b>Inter ( Part I )</b>	
<b>Marks :</b>	<b>17</b>	<b>Session (2020 – 22) to (2021 – 23)</b>	

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.

### Bahawalpur Board-2022

Q.No.1	Average Translational Kinetic Energy of Gas Molecule is related by :		
(1)	(A) $\frac{1}{2} KT$ (B) $KT$ (C) $\frac{2}{3} KT$ (D) $\frac{3}{2} KT$		
(2)	The S.I. unit of product of Pressure and Volume is : (A) Watt (B) Joule (C) Pascal (D) Kelvin		
(3)	When a Beam of white light falls perpendicularly on a plane of glass, then angle of refraction will be : (A) $90^\circ$ (B) $60^\circ$ (C) $0^\circ$ (D) $180^\circ$		
(4)	The phase difference of $180^\circ$ is equivalent to a path difference of : (A) $\frac{\lambda}{2}$ (B) $\frac{\lambda}{4}$ (C) $2\lambda$ (D) $\lambda$		
(5)	Speed of Sound in Air is independent of : (A) Density (B) Pressure (C) Temperature (D) Elasticity		
(6)	Speed of Sound at $10^\circ C$ is : (A) $332 \text{ ms}^{-1}$ (B) $339 \text{ ms}^{-1}$ (C) $349 \text{ ms}^{-1}$ (D) $360 \text{ ms}^{-1}$		
(7)	Total Energy of Particle in SHM is proportional to square of : (A) Acceleration (B) Velocity (C) Time Period (D) Amplitude		
(8)	Pressure is low where speed is : (A) High (B) Low (C) Zero (D) Constant		
(9)	The range of a projectile becomes half of the maximum range at angle of projection : (A) $15^\circ$ (B) $25^\circ$ (C) $45^\circ$ (D) $72^\circ$		
(10)	How many Radians are in a Semi Circle : (A) $2\pi \text{ rad}$ (B) $\frac{\pi}{2} \text{ rad}$ (C) $\pi \text{ rad}$ (D) $10\pi \text{ rad}$		
(11)	Escape Velocity of an object is independent of : (A) Mass of the Object (B) Mass of the Planet (C) Radius of the Planet (D) Type of Planet		
(12)	For the impulse to be zero, which of the following must be constant : (A) Force (B) Velocity (C) Acceleration (D) All these		
(13)	The time to reach the maximum height by the Projectile is : (A) $\frac{V_i \sin \theta}{g}$ (B) $\frac{2 V_i \sin \theta}{g}$ (C) $\frac{V_i^2 \sin^2 \theta}{g}$ (D) $\frac{V_i^2 \sin \theta}{g}$		
(14)	Minimum Coplanar unequal forces for producing equilibrium are : (A) 2 (B) 3 (C) 4 (D) 5		
(15)	$\hat{i} \cdot (\hat{j} \times \hat{k})$ equals : (A) 1 (B) Zero (C) $\hat{i}$ (D) $-\hat{j}$		
(16)	The percentage uncertainties in Length and Width of a rectangle are 2% and 3%. Its area has percentage uncertainty : (A) 1% (B) 5% (C) 6% (D) 2%		
(17)	The number 56.8546 is rounded off to three significant figures as : (A) 57.0 (B) 56.8 (C) 56.9 (D) 56.854		







Roll No.	1101 - 23000	Session (2020-22) to (2021-23)	Inter (Part - I)
Physics (Subjective)	Inter - A - 2022	Time 2 : 40 Hours Marks : 68	Group-Ist

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

**Bahawalpur Board-2022**

22 x 2 = 44

Q.No.2	(i)	What are the Dimensions and Units of Gravitational Constant G in the formula $F = G \frac{m_1 m_2}{r^2}$ ?
	(ii)	Why do we find it useful to have two units for the amount of substance, the kilogram and the mole ?
	(iii)	Write the dimensions of Pressure and Density.
	(iv)	Define Random Error and Systematic Error. How can these errors be reduced ?
	(v)	Can the velocity of an object reverse the direction when acceleration is constant? If so give an example.
	(vi)	Explain the circumstances in which the velocity $\vec{v}$ and acceleration $\vec{a}$ of a car are : (a) Anti Parallel (b) $\vec{v}$ is zero but $\vec{a}$ is not zero.
	(vii)	A football is thrown upward with an angle of $30^\circ$ above the horizon. To throw a 40 m pass what must be the initial speed of ball ?
	(viii)	Differentiate clearly between Elastic and Inelastic Collision. What can you say about momentum during these Collisions?
	(ix)	For an Adiabatic Process, write down the form of first law of Thermodynamics.
	(x)	Give an example of natural process that involves an increase in entropy.
	(xi)	A thermos flask containing milk as a system is shaken rapidly. Does the temperature of milk rise ?
	(xii)	Why does the pressure of a Gas in a car tyre increase when it is driven through some distance ?
Q.No.3	(i)	Can a vector have a component greater than the vector magnitude?
	(ii)	Is it possible to Add a Vector Quantity to a Scalar Quantity ? Explain.
	(iii)	If $\vec{A} + \vec{B} = 0$ what can you say about the components of the two vectors ?
	(iv)	State First and Second Conditions of Equilibrium.
	(v)	Does the work done in raising a box on the platform depend upon how fast it is raised up ? If not why ?
	(vi)	When Rocket re - enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from ?
	(vii)	What is meant by Moment of Inertia ? Explain its role in angular motion.
	(viii)	Describe what should be the maximum velocity for a satellite to orbit close to the earth around it ?.
	(ix)	Differentiate between Angular Acceleration and Centripetal Acceleration.
	(x)	State the Huygen's Principle.
	(xi)	Under what conditions two or more sources of light behave as coherent sources ?
	(xii)	How would you manage to get more orders of spectra using a diffraction grating?
Q.No.4	(i)	Why Fog Droplets appear to be suspended in air ?
	(ii)	Does frequency depend on Amplitude for Harmonic Oscillators?
	(iii)	Can we realize an Ideal Simple Pendulum ?
	(iv)	What information would you use to elaborate the formula of time period of Simple Pendulum? Support your answer with varying different parameters.
	(v)	How are beats useful in tuning musical instruments ?
	(vi)	As a result of distant explosion, an observer senses a ground tremor and then hears the explosion. Explain the time difference.
	(vii)	How the power is lost in optical fibre through dispersion ? Explain.
	(viii)	How would you compile the facts for reflection of Waves ?
	(ix)	What information would you use to write for single mode step index fibre ?



# Bahawalpur Board-2022

( Part II )

**L.K.No.1107**



Q.No.5	(a)	Define and explain the term Torque. Calculate the Torque due to force acting on a rigid body.	(5)
	(b)	How large a force is required to accelerate an electron ( $m = 9.1 \times 10^{-31}$ Kg) from rest to a speed of $2.0 \times 10^7 \text{ ms}^{-1}$ through a distance of 5.0 cm?	(3)
Q.No.6	(a)	Discuss how Astronauts get Artificial Gravity in space? Derive $f = \frac{1}{2\pi} \sqrt{\frac{g}{R}}$	(5)
	(b)	What is the Least Speed at which an Aeroplane can execute a vertical loop of 1.0 Km Radius? So that there will be no tendency for the pilot to fall down at the highest point.	(3)
Q.No.7	(a)	Define Bernoulli's Equation and prove that : $P + \frac{1}{2} \rho v^2 + \rho gh = \text{constant}$ for Ideal Fluid.	(5)
	(b)	A steel wire hangs vertically from a fixed point, supporting a weight of 80 N at its lower end. The diameter of the wire is 0.50 mm and its length from the fixed point to the weight is 1.5 m. Calculate the fundamental frequency emitted by the wire when it is plucked? (Density of Steel is $7.8 \times 10^3 \text{ Kg m}^{-3}$ )	(3)
Q.No.8	(a)	Discuss the energy conservation in Simple Harmonic Motion.	(5)
	(b)	A light is incident normally on a grating which has 2500 lines per centimeter. Compute the Wavelength of a Spectral Line for which the deviation in second order is $15.0^\circ$ .	(3)
Q.No.9	(a)	Define Molar Specific Heat of Gas. Show that $C_p - C_v = R$	(5)
	(b)	A compound Microscope has lenses of focal length 1.0 cm and 3.0 cm. An object is placed 1.2 cm from the object lens. If a virtual image is formed 25 cm from the eye, calculate the separation of the lenses and the magnification of the instrument.	(3)







<b>Physics</b>	<b>(C)</b>	<b>L.K.No. 1108</b>	<b>Paper Code No. 6476</b>
<b>Paper I</b>	<b>( Objective Type )</b>	<b>Inter – A – 2022</b>	<b>( Group 2nd )</b>
<b>Time :</b>	<b>20 Minutes</b>	<b>Inter ( Part I )</b>	
<b>Marks :</b>	<b>17</b>	<b>Session (2020 – 22) to (2021 – 23)</b>	

**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.

### Bahawalpur Board-2022

<b>Q.No.1</b> <b>(1)</b>	The magnitude of the vector product of two non-zero vectors $\vec{A}$ and $\vec{B}$ making an Angle $\theta$ with each other is : (A) $AB \sin \theta \cdot \hat{n}$ (B) $AB \cos \theta$ (C) $AB \sin \theta$ (D) $AB$
<b>(2)</b>	Error in the measurement of Sphere is 1%. The error in the calculated value of volume is : (A) 1 % (B) 3 % (C) 5 % (D) 7 %
<b>(3)</b>	The dimensions of the relation $\sqrt{\frac{F \times l}{m}}$ are equal to the dimensions of : (A) Force (B) Momentum (C) Acceleration (D) Velocity
<b>(4)</b>	If Cross Product of $\vec{A} \times \vec{B}$ is along y-axis, then $\vec{A}$ and $\vec{B}$ must lie in : (A) xy - Plane (B) yz - Plane (C) Space (D) xz - Plane
<b>(5)</b>	Tidal Energy is due to Gravitational Pull of : (A) Sun (B) Moon (C) Earth (D) Mars
<b>(6)</b>	In Projectile Motion, the Vertical Component of the Velocity : (A) Remains Constant (B) Becomes Zero (C) Varies Point to Point (D) Increases with time
<b>(7)</b>	For a typical rocket, how much mass of rocket is in the form of fuel : (A) 50 % (B) 60 % (C) 80 % (D) 100 %
<b>(8)</b>	If Linear Velocity and Radius are both made half of a body moving in a circle, the Centripetal Force becomes : (A) $F_c$ (B) $\frac{F_c}{2}$ (C) $\frac{F_c}{4}$ (D) $2 F_c$
<b>(9)</b>	In Mass Spring System, $\frac{1}{2} K x_0^2$ represents : (A) Total Energy (B) Kinetic Energy (C) Potential Energy (D) Velocity
<b>(10)</b>	The fluid is said to be incompressible if its density is : (A) Zero (B) Very High (C) Very Small (D) Constant
<b>(11)</b>	The ratio of Moment of Inertia of Disc and hoop is : (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{3}{4}$ (D) $\frac{3}{2}$
<b>(12)</b>	Types of Waves used in Sonar are : (A) Light Waves (B) Heat Waves (C) Sound Waves (D) Water Waves
<b>(13)</b>	The light signal in Optical Fibre must be regenerated by a device called : (A) Motor (B) Generator (C) Repeater (D) Laser
<b>(14)</b>	What remains constant in an Adiabatic Process : (A) Volume (B) Pressure (C) Temperature (D) Heat
<b>(15)</b>	If a Stretched String is 4 m and has 4 loops of Stationary Wave, then Wavelength is : (A) 1 m (B) 2 m (C) 3 m (D) 4 m
<b>(16)</b>	If $P$ = Pressure, $V$ = Volume of a Gas, then $P\Delta V$ represents : (A) Work (B) Density (C) Power (D) Temperature
<b>(17)</b>	Fringe Spacing increases if we use : (A) Red Light (B) Blue Light (C) Yellow Light (D) Green Light





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

**Bahawalpur Board-2022**

Make Diagram where necessary.

Part - I

22 x 2 = 44

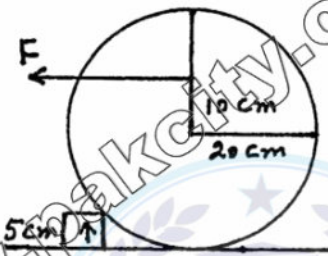
Q.No.2	(i)	Time for 40 vibrations of Simple Pendulum recorded by a stop watch with least count one tenth of a second is 80 . 6 s . Find Time Period.
	(ii)	The length and width of a rectangular plate are measured to be 15 . 3 cm and 12 . 80 cm respectively. Find area of plate .
	(iii)	The Wavelength $\lambda$ of a Wave depends on the speed $v$ of the wave and its frequency $f$ , knowing that $[\lambda] = [L]$ , $[v] = [LT^{-1}]$ and $[f] = [T^{-1}]$ . Decide which of the given is correct $f = v\lambda$ or $f = \frac{v}{\lambda}$
	(iv)	Give the drawbacks to use the period of Pendulum as Time Standard.
	(v)	Water is projected from two rubber pipes at the same speed from one at an angle of $30^\circ$ and from the other at $60^\circ$ . Why are the ranges equal ?
	(vi)	Define Projectile. Give examples and discuss its Horizontal and Vertical Accelerations.
	(vii)	Explain the difference between Elastic and Inelastic Collisions. Explain how would a bouncing ball behave in each case. Give Plausible reasons for fact that K.E. is not conserved in most cases ?
	(viii)	Can the velocity of an object reverses the direction when acceleration is constant ? If so give example.
	(ix)	A thermos flask containing milk as a system is shaken rapidly. Does the temperature of the milk rise ?
	(x)	Is it possible to a heat engine that will not expel heat into the atmosphere ?
	(xi)	Give an example of a natural process that involves an increase in entropy.
	(xii)	Write the Postulates of Kinetic Molecular Theory of Gases.
Q.No.3	(i)	A vector can not have a component greater than the Vector's Magnitude why ?
	(ii)	What is the magnitude of a vector $\vec{A} = -4\hat{i} + 5\hat{j}$ ? In which quadrant does the vector lie ?
	(iii)	If all the components of the vectors, $\vec{A}_1$ and $\vec{A}_2$ were reversed, how would this alter $\vec{A}_1 \times \vec{A}_2$ ?
	(iv)	A girl drops a cup from a certain height which breaks into pieces. What energy changes are involved ?
	(v)	Calculate the work done in kilo Joules in lifting a mass of 10 Kg through a vertical height of 10 m at steady velocity.
	(vi)	Define Kilowatt Hour. Show that $1 \text{ kWh} = 3.6 \text{ MJ}$ .
	(vii)	Obtain a relation for Orbital Velocity of a Satellite orbiting around the earth at a distance "r" from centre of the earth.
	(viii)	What is meant by Moment of Inertia ? Explain its role in angular motion.
	(ix)	Explain the difference between Tangential and Angular Velocity. How can these Velocities be related to each other ?
	(x)	Define Grating Element. A diffraction grating has 5000 lines / cm , calculate Grating Element.
	(xi)	An oil film spreading over a wet footpath shows colours. Explain how does it happen ?
	(xii)	Write down the two postulates of Huygen's Principle.
Q.No.4	(i)	What is Drag Force ? What will be the effect of Drag Force acting upon a small sphere of Radius " r " , moving down through a liquid , depend ?
	(ii)	What is meant by Phase Angle ? Does it define angle between maximum displacement and the driving force ?
	(iii)	If a Mass Spring System is hung vertically and set into oscillations, why does the motion eventually stop ?



(iv)	What is the frequency of Simple Pendulum if its length is 100 cm ?
(v)	What are the conditions of Constructive and Destructive Interference of Sound ?
(vi)	What features do Longitudinal Waves have in common with Transverse Waves ?
(vii)	Explain why sound travel faster in Warm Air than in Cold Air ?
(viii)	What do you mean by Linear Magnification and Angular Magnification ? Explain how a Convex Lens is used as Magnifier ?
(ix)	What is function of Repeaters in Transmission of Signals through Optical Fibres ?



## Part - II

Q.No.5	(a)	How would you prove that work done is independent of the path followed by a body? Also define conservative field.	(5)
	(b)	A Spherical Ball of weight 50 N is to be lifted over the step as shown in the figure. Calculate the minimum force needed just to lift it above the floor. 	(3)
Q.No.6	(a)	Define Projectile. Also derive the relation for : (i) Height of Projectile (ii) Time of Flight	(5)
	(b)	What is the Least Speed at which an Aeroplane can execute a vertical loop of 1.0 Km Radius? So that there will be no tendency for the pilot to fall down at the highest point.	(3)
Q.No.7	(a)	What is Doppler's Effect? Discuss its two cases for source and observer relative to each other.	(5)
	(b)	What Gauge Pressure is required in the city mains 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 Simple Harmonic Motion. Prove that the motion of Simple Pendulum is Simple Harmonic Motion. Also derive the expression for its time period.	(5)
	(b)	Yellow Sodium light of Wavelength 589 nm, emitted by a single source passes through two narrow slits 1.00 mm apart. The Interference pattern is observed on a screen 225 cm away. How far apart are two adjacent bright fringes ?	(3)
Q.No.9	(a)	What is meant by Molar Specific Heat of a Gas? Show that $C_p - C_v = R$	(5)
	(b)	An Astronomical Telescope having magnifying power of 5 consist of two thin lenses 24 cm apart. Find the focal lengths of the lenses.	(3)







<b>Physics</b>	<b>(D)</b>	<b>L.K.No. 1107</b>	<b>Paper Code No. 6477</b>
<b>Paper I</b>	<b>( Objective Type )</b>	<b>Inter – A – 2021</b>	<b>( Group Ist )</b>
<b>Time :</b>	<b>20 Minutes</b>	<b>Inter ( Part I )</b>	
<b>Marks :</b>	<b>17</b>	<b>Session (2017 -19) to (2020 – 22)</b>	

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.

Q.No.1	If the percentage uncertainty in the radius of sphere is 3 %, then total uncertainty in volume is :		
(1)	(A) 4 % (B) 7 % (C) 9 % (D) 13 %		
(2)	The magnitudes of Dot and Cross Product of two vectors are $2\sqrt{3}$ and 2 respectively , then the angle between vectors is :		
	(A) $30^\circ$ (B) $45^\circ$ (C) $60^\circ$ (D) $90^\circ$		
(3)	If two unit vectors are perpendicular to each other , then magnitude of their resultant is :		
	(A) 1 (B) $\sqrt{2}$ (C) $\sqrt{2.5}$ (D) $2\sqrt{2}$		
(4)	$\sqrt{\frac{F \times l}{m}}$ is equal to :		
	(A) Torque (B) Frequency (C) Speed (D) Power		
(5)	Acceleration of Rocket is given by the relation :		
	(A) $a = \frac{M}{mv}$ (B) $a = \frac{mv}{M}$ (C) $a = \frac{m}{Mv}$ (D) $a = \frac{Mv}{m}$		
(6)	The speed of hoop on reaching the bottom of an inclined plane is :		
	(A) $\sqrt{\frac{3}{4}gh}$ (B) $\sqrt{gh}$ (C) $\sqrt{\frac{4}{3}gh}$ (D) $\sqrt{2gh}$		
(7)	Kilo Watt - Second is the unit of :		
	(A) Power (B) Energy (C) Momentum (D) Time		
(8)	For which pair of angles , Range is same :		
	(A) $(15^\circ, 60^\circ)$ (B) $(35^\circ, 65^\circ)$ (C) $(30^\circ, 60^\circ)$ (D) $(20^\circ, 45^\circ)$		
(9)	The ratio of Rotational and Translational K.E. of hoop is :		
	(A) 1 : 2 (B) 1 : $\sqrt{2}$ (C) 1 : 1 (D) $\sqrt{2}$ : 1		
(10)	The value of $\gamma$ for diatomic gas is :		
	(A) 1.29 (B) 1.4 (C) 1.67 (D) 1.73		
(11)	Time Period of Simple Pendulum is directly proportional to :		
	(A) $\ell$ (B) $\ell^2$ (C) $\ell^{1/2}$ (D) $g$		
(12)	If Radius of Droplet is halved , then its Terminal Velocity becomes :		
	(A) Half (B) Double (C) One Fourth (D) Four Times		
(13)	The speed of sound at a given temperature is $v$ , by doubling pressure speed of sound is :		
	(A) $0.5 v$ (B) $v$ (C) $2 v$ (D) $3 v$		
(14)	Pressure of a Gas is equal to :		
	(A) $\frac{2}{3} \rho < v^2 >$ (B) $\frac{3}{2} \rho < v^2 >$ (C) $\frac{1}{3} \rho < v^2 >$ (D) $\rho < v^2 >$		
(15)	If a Convex Lens of Focal Length 5 cm is used as a Simple Microscope , then its magnifying Power is :		
	(A) 5 (B) 6 (C) 10 (D) 25		
(16)	Angle between Wavefront and Ray of light is :		
	(A) $0^\circ$ (B) $45^\circ$ (C) $60^\circ$ (D) $90^\circ$		
(17)	For a Diatomic Gas $C_v = \frac{5R}{2}$ then $\gamma$ for this gas is equal to :		
	(A) $\frac{5}{7}$ (B) $\frac{7}{5}$ (C) $\frac{4}{3}$ (D) $\frac{3}{4}$		







Roll No.	1107 - 2100	Session (2017-19) to (2020-22)	Inter (Part - I)
Physics (Subjective)	Inter - A - 2021	Time 2 : 40 Hours Marks : 68	Group Ist

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

22 x 2 = 44

- Q.No.2 (i) What are the Dimensions and Units of Gravitational Constant  $G$  in the formula  $F = G \frac{m_1 m_2}{r^2}$  ?
- (ii) Show that the famous Einstein Equation  $E = mc^2$  is dimensionally consistent.
- (iii) The time of 30 vibrations of a simple pendulum recorded by a stop watch accurate upto one tenth of a second is 54.6 s. Find its period with uncertainty ?
- (iv) The Wavelength of a Wave depends on the speed  $V$  and its frequency  $f$ , decide which of the given is correct  $f = v\lambda$ ,  $f = v/\lambda$  ?
- (v) Can you add zero to a Null Vector ?
- (vi) If all the components of the vectors  $\vec{A}_1$  and  $\vec{A}_2$  were reversed, how would this alter  $\vec{A}_1 \times \vec{A}_2$  ?
- (vii) Show that the Vector Addition is Commutative.
- (viii) At what point or points in its path does a projectile have its minimum speed, its maximum speed ?
- (ix) How impulse is related to linear momentum ?
- (x) Define two types of Collisions.
- (xi) Show that the range of projectile is maximum when projectile is thrown at an angle of  $45^\circ$  with the horizontal ?
- (xii) Why Fog Droplets appear to be suspended in air ?
- Q.No.3 (i) In which case is more work done: when a 50 Kg bag of books is lifted through 50 cm OR when a 50 Kg crate is pushed through 2 m across the floor with a force of 50 N ?
- (ii) Show that Power is the Dot Product of Force and Velocity.
- (iii) Define Kilowatt Hour.
- (iv) Show that  $a = r\alpha$  where  $\alpha$  is the Angular Acceleration.
- (v) Write down three equations of Angular Motion.
- (vi) When Mud flies off the tyre of a moving Bicycle ? In what direction does it fly ? Explain.
- (vii) Find the Time Period of Simple Pendulum if the value of " $g$ " increases by 2-times and mass of the Bob increases 2-times ?
- (viii) Define Resonance giving one example of Resonance.
- (ix) When the Oscillation is given to the Mass Spring System, why this system do not oscillate indefinitely ?
- (x) What is the difference between Open and Closed Organ Pipe ?
- (xi) How the Velocity of Waves generated in a String change, if the tension in the String is made 4-times ?
- (xii) What is the effect of pressure and Density of the Medium on the Velocity of Sound ?
- Q.No.4 (i) Define Diffraction Grating and Grating Element.
- (ii) Can Visible light produce interference fringes ? Explain.
- (iii) Under what conditions two or more sources of light behave as Coherent Sources of light ?
- (iv) What do you mean by Normal Adjustment of Astronomical Telescope ?
- (v) What is Spectrometer ? Give names of its main parts.
- (vi) What are Source and Sink for Carnot Engine ?
- (vii) Write down two Postulates for Kinetic Theory of Gases.
- (viii) Specific Heat of a gas at constant pressure is greater than the specific heat at constant volume. Why ?
- (ix) Is it possible to construct a heat engine that will not expel heat into atmosphere ?

Part - II



- Q.No.5 (a) Explain the addition of Vectors by Rectangular Components. (5)
- (b) A 1500 Kg car has its velocity reduced from 20 m/sec to 15 m/sec in 3.0 sec. How large was the average retarding force ? (3)
- Q.No.6 (a) Derive Newton's formula for the speed of sound in air and describe the correction by Laplace in it. (5)
- (b) How large a force is required to accelerate an electron ( $m = 9.1 \times 10^{-31}$  Kg) from rest to a speed of  $2.0 \times 10^7$  ms<sup>-1</sup> through a distance of 5.0 cm ? (3)
- Q.No.7 (a) Define Centripetal Force and derive the relation of Centripetal Force. (5)
- (b) What Gauge Pressure is required in the city mains 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) Consider a Horizontal Spring Mass System. Discuss Law of Conservation of Energy for this System. (5)
- (b) A Heat Engine performs 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.9 (a) Describe the construction and working of Michelson's Interferometer. (5)
- (b) An Astronomical Telescope having magnifying power of 5 consists of two thin lenses 24 cm apart. Find the Focal Lengths of these lenses. (3)







<b>Physics</b>	<b>(A)</b>	<b>L.K.No. 1108</b>	<b>Paper Code No. 6472</b>
<b>Paper I</b>	<b>( Objective Type )</b>	<b>Inter – A – 2021</b>	<b>( Group 2nd )</b>
<b>Time :</b>	<b>20 Minutes</b>	<b>Inter ( Part I )</b>	
<b>Marks :</b>	<b>17</b>	<b>Session (2017 -19) to (2020 – 22)</b>	

**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.

Q.No.1	In earth's Gravitational Field , work done in a closed path is :
(1)	(A) Maximum (B) Positive (C) Negative (D) Zero
(2)	A two meter high tank is full of water. A hole appears at its middle , what is speed of Efflux : (A) 3.75 m/s (B) 4.91 m/s (C) 4.42 m/s (D) 5.11 m/s
(3)	A particle execute SHM of amplitude A . Potential Energy is maximum when the displacement is : (A) $\pm A$ (B) Zero (C) $\pm \frac{A}{2}$ (D) $\pm \frac{A}{\sqrt{2}}$
(4)	In Young's Double Slit Experiment the Fringe Spacing is equal to : (A) $\frac{d}{\lambda L}$ (B) $\frac{L}{\lambda d}$ (C) $\frac{\lambda L}{d}$ (D) $\frac{Ld}{\lambda}$
(5)	Expression for Resolving Power of Lens is : (A) $\alpha_{min} = \frac{\lambda}{D}$ (B) $R = \frac{1}{\alpha_{min}}$ (C) $R = \frac{D}{1.22 \lambda}$ (D) $R = \frac{\lambda}{\lambda_2 - \lambda_1}$
(6)	Which of the following measurement is more precise : (A) 3127 s (B) 312.7 s (C) 31.27 s (D) 3.127 s
(7)	A system takes 88 seconds to complete 25 oscillations. Time period of the system is : (A) 3.52 s (B) 35.2 s (C) 3.82 s (D) 0.032 s
(8)	If $r = 5 \text{ m}$ and $F = 4 \text{ N}$ are along same direction then Torque is : (A) 5 N-m (B) 20 N-m (C) 10 N-m (D) Zero
(9)	If Vector makes angle $\theta$ with the x-axis , its x-component is : (A) $A \sin \theta$ (B) $A \tan \theta$ (C) $A \cos \theta$ (D) $A \sec \theta$
(10)	Which of the given variable is present in all three equations of Motion : (A) Acceleration (B) Distance (C) Time (D) Torque
(11)	Motion along y-axis is : (A) One Dimensional (B) Two Dimensional (C) Three Dimensional (D) Angular
(12)	One Radian is equal to : (A) $2\pi \text{ rev}$ (B) $\frac{\pi}{4} \text{ rev}$ (C) $\frac{\pi}{2} \text{ rev}$ (D) $\frac{1}{2\pi} \text{ rev}$
(13)	S.I. Unit of Angular Acceleration is : (A) $\text{rad/s}^2$ (B) $\text{rev/s}^2$ (C) $\text{degree/s}^2$ (D) $\text{m/s}^2$
(14)	If 20 Waves passes through medium in 1 second with speed of $20 \text{ ms}^{-1}$ , then Wavelength is : (A) 20 m (B) 200 m (C) 400 m (D) 1 m
(15)	Velocity of Sound is maximum in : (A) Air (B) Nitrogen (C) Metal (D) Glass
(16)	The Efficiency of Heat Engine is 100% , when temperature of Sink is : (A) $0^\circ\text{C}$ (B) $0^\circ\text{F}$ (C) 0 K (D) 273 K
(17)	Area under p-v Diagram of Carnot Engine represents : (A) Heat Input (B) Heat Output (C) Efficiency (D) Work done





# Bahawalpur Board-2021



Roll No.	1108 - 2000	Session (2017-19) to (2020-22)	Inter (Part - I)
Physics (Subjective)	Inter - A - 2021	Time 2 : 40 Hours Marks : 68	Group 2nd

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

22 x 2 = 44

Q.No.2	(i)	What are the Dimensions and Units of Gravitational Constant G in the formula $F = G \frac{m_1 m_2}{r^2}$ ?	
	(ii)	Is a Precise Measurement also an Accurate Measurement ? Explain your answer.	
	(iii)	Show that the equation $V_f = V_i + at$ is dimensionally correct.	
	(iv)	Is it possible to add a Vector Quantity to a Scalar Quantity ? Explain.	
	(v)	How would the two vectors of the same magnitude have to be oriented if they were to be combined to give a resultant equal to a vector of the same magnitude ?	
	(vi)	If all the components of the vectors $\vec{A}_1$ and $\vec{A}_2$ were reversed, how would this alter $\vec{A}_1 \times \vec{A}_2$ ?	
	(vii)	State the Law of Conservation of Linear Momentum, pointing out the importance of Isolated System.	
	(viii)	Prove that for angles of Projection, which exceed or fall short of $45^\circ$ by equal amounts the ranges are equal.	
	(ix)	What is Force due to Water Flow ?	
	(x)	Explain the difference between Laminar Flow and Turbulent Flow.	
	(xi)	Write the Dimensions of : (a) Density (b) Power	(xii) Does a Moving Object have impulse ?
Q.No.3	(i)	Define Power and Absolute P.E.	(ii) Define Stationary Waves and Organ Pipe.
	(iii)	Why does sound travel faster in Solids than in Gases?	(iv) Prove the relation $v = f\lambda$ for Waves.
	(v)	Define Work Energy Principle and write its formula.	(vi) Define Simple Pendulum and Second Pendulum.
	(vii)	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.	
	(viii)	Define Angular Velocity and Angular Displacement.	
	(ix)	Find the speed of Hoop on reaching at the bottom of the inclined plane when rolled down from an inclined plane of height h.	
	(x)	Explain the difference between Tangential Velocity and the Angular Velocity. If one of these is given for a wheel of known radius, how will you find the other ?	
	(xi)	Under what conditions does the addition of two simple Harmonic Motions produce a resultant, which is also Simple Harmonic ?	
	(xii)	Explain the relation between Total Energy, Potential Energy and Kinetic Energy for a body oscillating with S.H.M.	
Q.No.4	(i)	Can Visible light produce interference fringes ? Explain.	
	(ii)	Explain whether the Young's Experiment is an Experiment for studying Interference or Diffraction Effects of light?	
	(iii)	What are Newton's Rings ? Why the centre of the Newton's Rings is dark for reflected light ?	
	(iv)	Explain the difference between Magnifying Power and Resolving Power of Optical Instrument ?	
	(v)	What is the function of Collimator in Spectrometer ?	
	(vi)	Can the mechanical energy be converted completely into Heat Energy, if so give an example.	
	(vii)	What is the difference between Isothermal and Adiabatic Process ?	
	(viii)	State 1st Law of Thermodynamics. How it is applicable on human body ?	
	(ix)	Derive Boyle's Law from Kinetic Theory of Gases.	
Part - II			
Q.No.5	(a)	Define Vector Product. Write down the four characteristics of Scalar Product.	(5)
	(b)	A ball is thrown horizontally from a height of 10 m with velocity of 21 m/s. How far off it hit the ground and with what velocity ?	(3)
Q.No.6	(a)	Define Absolute Potential Energy. Derive relation for Absolute P.E. of body of mass m on the surface of earth.	(5)
	(b)	A stationary wave is established in a string which is 120 cm long and fixed at both ends. The string vibrates in four segments at a frequency of 120 Hz. Determine its Wavelength and the fundamental frequency.	(3)
Q.No.7	(a)	What are Real and Apparent Weight ? Find the apparent weight in different cases for an object suspended by a string and spring balance in an elevator moving vertically.	(5)
	(b)	What Gauge Pressure is required in the city mains 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)	What is Carnot Engine ? Discuss Carnot Cycle, also derive relation for its efficiency.	(5)
	(b)	A block of Mass 4 Kg is dropped from height of 0.6 m on to a spring of Spring Constant $K = 1960 \text{ Nm}^{-1}$ . Find the maximum distance through which spring will be compressed ?	(3)
Q.No.9	(a)	Write down the construction of Compound Microscope and derive a relation for its Angular Magnification.	(5)
	(b)	In a Double Slit Experiment, the second order maximum occurs at $\theta = 25^\circ$ . The Wavelength is 650 nm. Determine the Slit Separation.	(3)







Physics	(A)	L.K.No. 1109	Paper Code No. 6471
Paper I	(Objective Type)	Inter -A- 2019	(New Pattern)
Time :	20 Minutes	Inter (Part I)	(Group Ist)
Marks :	17	Session (2015 -17) to (2018 - 20)	

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.

### Bahawalpur Board-2019

Q.No.1	The numerical value of constants in any formula cannot be determined by dimensional analysis , (1) however it can be found by : (A) Addition (B) Physical Quantities (C) Experiments (D) Uncertainty
(2)	A measurement taken by Vernier Calliper with least count as 0.01 cm is recorded as 0.45 cm , it has fractional uncertainty : (A) 0.01 (B) 0.02 (C) 0.03 (D) 0.45
(3)	The Unit Vector in the direction of $\vec{A}$ is : (A) $\hat{A} = \frac{A}{A}$ (B) $\hat{A} = A\vec{A}$ (C) $\hat{A} = \frac{\vec{A}}{A}$ (D) $\vec{A} = \frac{A}{\hat{A}}$
(4)	If $\vec{A} \times \vec{B}$ is along y-axis, then $\vec{A}$ and $\vec{B}$ are in : (A) x-y Plane (B) y-z Plane (C) Space (D) x-z Plane
(5)	Everything in the vastness of space is in a state of : (A) Rest (B) Rectilinear Motion (C) Perpetual Motion (D) Projectile Motion
(6)	One Watt Hour is equal to : (A) 3.6 MJ (B) 3.6 KJ (C) 36 KJ (D) 36 MJ
(7)	Angle $30^\circ$ is equal to : (A) $\frac{\pi}{2}$ rad (B) $\frac{\pi}{3}$ rad (C) $\frac{\pi}{4}$ rad (D) $\frac{\pi}{6}$ rad
(8)	The Rotational K.E. of Disc is equal to : (A) $\frac{1}{4} mv^2$ (B) $\frac{1}{2} mv^2$ (C) $\frac{1}{4} I\omega^2$ (D) $I\omega^2$
(9)	A 20 metre high tank is full of water. A hole appears at its middle. The speed of efflux will be : (A) $10 \text{ ms}^{-1}$ (B) $14 \text{ ms}^{-1}$ (C) $11.5 \text{ ms}^{-1}$ (D) $9.8 \text{ ms}^{-1}$
(10)	Bernoulli's Equation based upon Law of Conservation of : (A) Mass (B) Linear Momentum (C) Angular Momentum (D) Energy
(11)	If the Initial Phase is $\frac{\pi}{2}$ then displacement of SHO is : (A) $x = x_0^2 \sin wt$ (B) $x = \sin wt$ (C) $x = x_0 \cos wt$ (D) Zero
(12)	When an Observer is moving away from a stationary source , sending waves with speed $v$ , the waves received by him at the rate of : (A) $\frac{v - u_o}{\lambda}$ (B) $\frac{v + u_o}{\lambda}$ (C) $\frac{\lambda}{v - u_o}$ (D) $\frac{\lambda}{v + u_o}$
(13)	When a Transverse Wave travelling in rare medium , incident on denser medium after reflection phase changes by : (A) $360^\circ$ (B) $180^\circ$ (C) $90^\circ$ (D) $0^\circ$
(14)	Polarization proves that light waves are : (A) Longitudinal (B) Stationary (C) Matter (D) Transverse
(15)	The magnifying power of a magnifying glass is : (A) $1 - \frac{d}{f}$ (B) $1 - \frac{f}{d}$ (C) $\frac{f}{d}$ (D) $\frac{d}{f} + 1$
(16)	If $C_p$ for a gas is $\frac{7R}{2}$ then the value of $C_v$ will be : (A) $\frac{3R}{2}$ (B) $\frac{5R}{2}$ (C) $\frac{9R}{2}$ (D) R
(17)	If the temperature of sink is equal to absolute zero , the efficiency of heat engine should be : (A) 100 % (B) 50 % (C) Zero (D) Infinity





Roll No.	1109 - 2500	Session (2015 - 17 ) to (2018 - 20)	Inter (Part - I) / (Group Ist )
Physics (Subjective )	Inter - A - 2019	Time 2 : 40 Hours Marks : 68	(New Pattern)

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 given in the Question Paper

## Bahawalpur Board-2019

Make Diagram where necessary.

Part - I

22 x 2 = 44

- Q.No.2 (i) Show that Einstein Equation  $E = mc^2$  is dimensionally correct.  
(ii) Given that  $V = (5.2 \pm 0.1)$  volt. Find its percentage uncertainty.  
(iii) What is a Unit Vector? Give its formula.  
(iv) Can a body rotate about its centre of gravity under the action of its weight? Explain.  
(v) Can the magnitude of a vector have a negative value? Discuss.  
(vi) Define Joule using formula for the work done.  
(vii) When a rocket re-enters the atmosphere, its nose cone becomes hot. Where does this heat energy come from?  
(viii) Define Drag Force. Give its formula.  
(ix) Two row boats moving parallel in the same direction are pulled towards each other. Explain.  
(x) Does the Acceleration of a Simple Harmonic Oscillator remain constant during its motion? Is the Acceleration ever zero? Explain.  
(xi) If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop?  
(xii) Name two characteristics of Simple Harmonic Motion.
- Q.No.3 (i) Explain the condition in which velocity "v" is zero and acceleration of a car is not zero.  
(ii) Define Isolated System. Give its example.  
(iii) Define Impulse. Give its units.  
(iv) At what point or points in its path does a projectile have its minimum speed, its maximum speed?  
(v) Explain what is meant by Centripetal Force? Give its formula.  
(vi) Show that Orbital Angular Momentum is given as  $L_p = mvr$   
(vii) Give one practical application of the Rotational Kinetic Energy.  
(viii) Why does a Diver change his body position before and after diving in the pool?  
(ix) What is the effect of pressure of the Medium on the speed of sound?  
(x) Differentiate between Transverse and Longitudinal Waves.  
(xi) Explain why sound travels faster in Warm Air than Cold Air?  
(xii) Explain the term Nodes and Antinodes.
- Q.No.4 (i) For what purpose Huygen's Principle is used?  
(ii) How would you manage to get more orders of Spectra using a diffraction grating?  
(iii) An oil film spreading over a wet footpath shows colours. Explain how does it happen?  
(iv) If a person was looking through a telescope at the full moon, how would the appearance of the moon be changed by covering half of the objective lens?  
(v) Define Resolving Power. Give its expression.  
(vi) What happens to the temperature of the room, when an air conditioner is left running on a table in the middle of the room?  
(vii) Is it possible to construct a heat engine that will not expel heat into the atmosphere?  
(viii) Carnot Cycle provides the basis to define a temperature scale that is independent of material properties. Explain.  
(ix) Define Entropy. Explain in terms of Second Law of Thermodynamics.

### Part - II

- Q.No.5 (a) Define Molar Specific Heats of Gases and prove that the relation  $C_p - C_v = R$  (5)  
(b) The length and width of rectangular plate are measured to be 15.3 cm and 12.80 cm respectively. Find the correct area of the plate. (3)
- Q.No.6 (a) State and explain law of Conservation of Linear Momentum. (5)  
(b) A load of 10 N is suspended from a clothes line. This distorts the line so that it makes an angle of  $15^\circ$  with the horizontal at each end. Find the tension in the clothes line. (3)
- Q.No.7 (a) Prove that the work done is independent of the path followed in Gravitational Field. (5)  
(b) An Organ Pipe has a length of 50 cm. Find the frequency of its fundamental note and the next harmonic when it is open at both ends. (3)
- Q.No.8 (a) Discuss the energy conservation in SHM. (5)  
(b) Calculate the angular momentum of a Star of Mass  $2 \times 10^{30}$  Kg and radius  $7.0 \times 10^5$  Km. If it makes one complete rotation about its axis once in 20 days. (3)
- Q.No.9 (a) What is Interference of Light? Discuss the Young's Double Slit Experiment. Also Derive the relation for Fringe Spacing. (5)  
(b) An Astronomical Telescope having magnifying power of 5 consists of two thin lenses 24 cm apart. Find the Focal Length of the lenses. (3)







# Bahawalpur Board-2019

Physics	(A)	L.K.No. 1110	Paper Code No. 6472
Paper I	(Objective Type)	Inter -A- 2019	(New Pattern)
Time :	20 Minutes	Inter (Part I)	(Group 2 <sup>nd</sup> )
Marks :	17	Session (2015 -17) to (2018 - 20)	

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.

Q.No.1	Which one of the following is not a unit of energy :
(1)	(A) Kilowatt (B) Erg (C) Joule (D) Kilowatt hour
(2)	How many significant zeros are there in the amount 0.00501 : (A) 1 (B) 2 (C) 3 (D) 4
(3)	Magnitude of Resultant Vector of 6 N and 8 N which are perpendicular to each other is : (A) 14 N (B) 10 N (C) 20 N (D) 2 N
(4)	If a Force of 5 N is applied parallel to Moment Arm of 5 m , then Torque is equal to : (A) 25 Nm (B) 5 Nm (C) 10 Nm (D) Zero Nm
(5)	Area under velocity - time graph represents : (A) Force (B) Displacement (C) Distance (D) Acceleration
(6)	Consumption of Energy by a 60 Watt Electric Bulb in 2 Seconds is : (A) 120 J (B) 60 J (C) 30 J (D) 0.5 J
(7)	The correct S.I. Unit of Angular Momentum is : (A) $\text{Kgs m}^{-2}$ (B) $\text{Kg ms}^{-1}$ (C) $\text{Kg m}^2 \text{s}^{-1}$ (D) $\text{Kg m}^2 \text{s}^{-2}$
(8)	If External Torque on a body is zero , then which of these quantities is constant : (A) Force (B) Linear Momentum (C) Linear Velocity (D) Angular Momentum
(9)	A 10 meter high tank is full of water. A hole appears at its middle. The speed of efflux will be : (A) $5 \text{ ms}^{-1}$ (B) $10 \text{ ms}^{-1}$ (C) $100 \text{ ms}^{-1}$ (D) $5.11 \text{ ms}^{-1}$
(10)	The S.I. Unit of Flow Rate of a Fluid is : (A) $\text{m}^2 \text{s}^{-1}$ (B) $\text{ms}^{-1}$ (C) $\text{m}^3 \text{s}^{-1}$ (D) $\text{m}^3 \text{s}^{-2}$
(11)	The distance covered by a body in one complete vibration is 20 cm , what is the amplitude of the vibration : (A) 10 cm (B) 80 cm (C) 5 cm (D) 20 cm
(12)	Newton calculated speed of sound in air using the process : (A) Adiabatic (B) Isobaric (C) Isochoric (D) Isothermal
(13)	In a stretched string , if speed of the wave is doubled , the tension in string will increase by : (A) 2 (B) 4 (C) 6 (D) 8
(14)	The locus of all points in the same phase of vibration is : (A) Wavefront (B) Wavelength (C) Crest (D) Trough
(15)	When light ray travels from one medium to another , the characteristic which does not change is : (A) Velocity (B) Wavelength (C) Amplitude (D) Frequency
(16)	The Average Kinetic Energy of Gas is zero at : (A) $0^\circ\text{C}$ (B) $-273^\circ\text{C}$ (C) $100^\circ\text{C}$ (D) 100 K
(17)	At constant temperature , if pressure is halved , then its volume : (A) Constant (B) Halved (C) Doubled (D) Four Times





Roll No.	1110 - 254000	Session (2015 -17 ) to (2018 - 20)	Inter (Part - I) / ( Group 2nd )
Physics (Subjective )	Inter - A -2019	Time 2 : 40 Hours Marks : 68	(New Pattern)

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 given in the Question Paper

## Bahawalpur Board-2019

Make Diagram where necessary.

Part - I

22 x 2 = 44

- Q.No.2 (i) The period of a Pendulum cannot be used as a Time Standard why?  
(ii) What is the difference between Kilogram and Mole?  
(iii) Explain Cartesian Coordinate System.  
(iv) Can a body rotate about its centre of gravity under the action of its weight? Explain.  
(v) If two perpendicular vectors have same magnitude, find the angle between their sum and difference?  
(vi) An object has 2 Joule potential energy. Explain what does it mean?  
(vii) Explain the situations in which work is positive, negative or zero.  
(viii) Derive Venturi Relation.  
(ix) How a Dynamic Lift is produced in an Aeroplane?  
(x) Does the Acceleration of a Simple Harmonic Oscillator remain constant during its motion? Explain.  
(xi) What should be the natural period of Simple Pendulum whose length is 90 cm?  
(xii) Explain the Tuning of Radio by Resonance.
- Q.No.3 (i) Define Longitudinal Waves. Give an example.  
(ii) Give the effect of Variation of Pressure on the speed of sound.  
(iii) Explain the terms : (i) Crest (ii) Trough  
(iv) Is it possible for two identical waves travelling in the same direction along a string to give rise to a stationary wave?  
(v) Show that Orbital Angular Momentum  $L_0 = mvr$   
(vi) What is meant by Centripetal Force and why it must be furnished to an object if the object is to follow a circular path?  
(vii) Prove that  $v = r\omega$   
(viii) Define Angular Acceleration. Also give its formula.  
(ix) Derive formula for the time of Flight of a Projectile.  
(x) Show that range of a projectile is maximum at an angle of projection of  $45^\circ$ .  
(xi) Explain the circumstances in which the velocity  $\vec{v}$  and acceleration  $\vec{a}$  of a car are :  
(i) Perpendicular (ii) Parallel  
(xii) Can the velocity of an object reverse direction when acceleration is constant? If so give an example.
- Q.No.4 (i) How does one can obtain a plane wave?  
(ii) Can visible light produce interference fringes? Explain.  
(iii) Define Ray of Light and Beam of Light.  
(iv) Why would it be advantageous to use blue light with compound microscope?  
(v) How a Convex Lens is used as a Magnifier?  
(vi) Define Thermodynamics.  
(vii) Explain with example that heat can be added to a system without heating.  
(viii) Can the Mechanical Energy be converted completely into Heat Energy? If so give an example.  
(ix) Specific Heat of a Gas at constant pressure is greater than specific heat at constant volume. Explain.

### Part - II

- Q.No.5 (a) Define First Law of Thermodynamics and discuss it by giving appropriate examples. (5)  
(b) Show that the famous "Einstein Equation  $E = mc^2$ " is dimensionally consistent. (3)  
Calculate equivalence energy of one kilogram.
- Q.No.6 (a) Define Rectangular Components of a vector. How two vectors can be added by rectangular components method? (5)  
(b) A ball is thrown horizontally from a height of 10 m with velocity of 21 m/s. How far off it hit the ground and with what velocity? (3)
- Q.No.7 (a) What is Escape Velocity? Derive an expression for it and calculate its value on the surface of the earth. (5)  
(b) Two tuning forks exhibit beats at a beat frequency of 3 Hz. The frequency of One Fork is 256 Hz. Its frequency is then lowered slightly by adding a bit of wax to one of its prong. The two forks then exhibit a beat frequency of 1 Hz. Determine the frequency of the second tuning fork. (3)
- Q.No.8 (a) Prove the law of conservation of energy in vibrating mass-spring system. (5)  
(b) An electric fan rotating at  $3 \text{ rev s}^{-1}$  is switched off. It comes to rest in 18.0 s. Assuming deceleration to be uniform, find its value. How many revolutions did it turn before coming to rest? (3)
- Q.No.9 (a) Describe the diffraction of x-rays by crystals, hence derive Bragg's Equation. (5)  
(b) A compound microscope has lenses of focal lengths 1.0 cm and 3.0 cm. An object is placed 1.2 cm from the object lens. If a virtual image is formed 25 cm from the eye, calculate the separation of the lenses and the magnification of the instrument. (3)







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 number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Q.No.1	Number of Steradians in a Solid Sphere is :
(1)	(A) $\pi$ (B) $2\pi$ (C) $4\pi$ (D) $\frac{\pi}{2}$
(2)	If a Vector $\vec{A}$ makes an angle $\theta^\circ$ with x-axis then its x - component is : (A) $A \cos \theta$ (B) $A^2$ (C) $A$ (D) $A \sin \theta$
(3)	The Magnitude of $\hat{i} \times \hat{j}$ is equal to : (A) 1 (B) $\hat{k}$ (C) $-\hat{k}$ (D) Zero
(4)	Significant Figures in 0.0010 are : (A) 1 (B) 2 (C) 3 (D) 4
(5)	Original Source of Energy for Biomass is : (A) Earth (B) Moon (C) Sun (D) Star
(6)	Change of Momentum is called : (A) Acceleration (B) Impulse (C) Force (D) Pressure
(7)	Angular Momentum has the same unit as : (A) Impulse x Distance (B) Power x time (C) Linear Momentum x time (D) Work x frequency
(8)	The number of Satellite which form the Global Positioning System close to earth are : (A) 22 (B) 24 (C) 30 (D) 34
(9)	A 6.0 meter high tank is full of water. A hole appears at its middle. What is speed of efflux : (A) $5.66 \text{ ms}^{-1}$ (B) $6.66 \text{ ms}^{-1}$ (C) $7.66 \text{ ms}^{-1}$ (D) $8.66 \text{ ms}^{-1}$
(10)	In a Stretched String, if speed of Wave is doubled the tension will be : (A) 2 (B) 4 (C) 8 (D) 6
(11)	In which of following Speed of Sound Wave is greatest (A) Air (B) Water (C) Vacuum (D) Steel
(12)	The Dimensions of Spring Constant "K" are : (A) $[MT^{-2}]$ (B) $[M^{-2}T]$ (C) $[M^2T^{-2}]$ (D) $[MLT^{-2}]$
(13)	The locus of all points in the same Phase of Vibration is called : (A) Wave Front (B) Interference (C) Diffraction (D) Polarization
(14)	The Internal Energy of System does not depend on : (A) Temperature (B) Pressure (C) Path (D) Initial and Final State
(15)	The least distance of Distinct Vision is : (A) 5 cm (B) 10 cm (C) 30 cm (D) 25 cm
(16)	Which is not Optically Active : (A) Sugar (B) Tartaric Acid (C) Water (D) Sodium Chlorate
(17)	The Mean Kinetic Energy of Gas is zero at : (A) $0^\circ\text{C}$ (B) $-273^\circ\text{C}$ (C) 100 K (D) $100^\circ\text{C}$





Roll No.	809 - 23000	New Pattern ( Group Ist )
Physics (Subjective)	Inter-A-2018	Inter ( Part - I )
Time = 2 : 40 Hours	Total Marks : 68	Session ( 2015 - 17 ) to ( 2017 - 19 )

Note : It is compulsory to attempt ( 8 - 8 ) parts each from Q.No.2 and Q.No. 3 while attempt any (6) parts from Q. No.4 and attempt any (03) questions from Part II. Write same Question No. and its Part No. as given in the question paper.

## Bahawalpur Board-2018

Part - I

22 x 2 = 44

Q.No.2 (i) Write the dimensions of : (i) Pressure (ii) Density



(ii) How many Nanoseconds in one year?

(iii) Define Precision and Accuracy.

(iv) The time period of Simple Pendulum is measured by the stop watch. What type of errors are possible in the time period?

(v) Is it possible to add a Vector Quantity to Scalar Quantity? Explain.

(vi) Write down the condition for a body to be a complete equilibrium.

(vii) Prove that  $\vec{A} \cdot \vec{B} = A_x B_x + A_y B_y + A_z B_z$

(viii) Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Discuss.

(ix) Write any two properties of an Inertial frame of Reference.

(x) Define Impulse. Also give its S.I. Unit.

(xi) Explain what do you understand by the term Viscosity.

(xii) Define Torricelli's Theorem.

Q.No.3 (i) Calculate the work done in Kilo Joules in lifting a mass of 10 Kg through a vertical height of 10 m.

(ii) Define Joule and Watt.

(iii) Derive the relation between Power, Force and Velocity.

(iv) A Disc and a hoop start moving down from the top of an inclined plane at the same time. Which one will be moving faster on reaching the bottom?

(v) Why does a diver change his body position before and after diving in the pool?

(vi) Why Einstein's Theory of Gravitation is better than Newton's?

(vii) Why the Motion of Projection of a point revolving in a circle with variable angular velocity is not Simple Harmonic Motion?

(viii) What do you mean by Phase?

(ix) What is meant by Phase Angle? Does it define angle between Maximum Displacement and the Deriving Force?

(x) Is it possible for two Identical Waves travelling in the same direction along a string to give rise to a stationary wave?

(xi) How should a sound source move with respect to an observer, so that the frequency of its sound does not change?

(xii) Taking an example of Periodic Wave, prove that  $v = f\lambda$

Q.No.4 (i) Why the Polaroid Sunglasses are better than Ordinary Sunglasses?

(ii) An oil film spreading over a wet footpath shows colours. Explain briefly.

(iii) Write two points of Huygen's Principle.

(iv) Focal Length of a Convex Lens is 5 cm. Calculate its magnification.

(v) Define Refractive Index of a Medium. Write its two mathematical forms.

(vi) Derive Boyle's Law from Kinetic Theory of Gases.

(vii) Why the Average Velocity of the Molecules in a Gas is zero, but the average of square of the velocity is not zero? Explain.

(viii) Define Adiabatic Process. Give one example.

(ix) No Spark Plug is used in Diesel Engine. How it gets ignition?

P.T.O.



## Bahawalpur Board-2018

L.K.No. 809



Part - II

- Q.No.5 (a) Define Projectile and derive an expression for maximum height and Horizontal Range of the projectile? (5)
- (b) The magnitude of Dot and Cross Products of two vectors are  $6\sqrt{3}$  and 6. Find the angle between the vectors. (3)
- Q.No.6 (a) Define Absolute P.E. Derive an expression for it in Gravitational Field. (5)
- (b) A Gramophone Record turn table accelerates from rest to an angular velocity of  $45 \text{ rev min}^{-1}$  in 1.60 second. What is its Average Angular Acceleration? (3)
- Q.No.7 (a) State First Law of Thermodynamics and apply this law in Isothermal Expansion and in Adiabatic Expansion Processes. (5)
- (b) A Heat Engine performs 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) What is Simple Pendulum? Show that its time period depends only on the length and acceleration due to Gravity. (5)
- (b) Find the temperature at which the velocity of Sound in air is two times its velocity at  $10^\circ\text{C}$ ? (3)
- Q.No.9 (a) What is Simple Microscope? Derive the relation for its Magnification? (5)
- (b) In Double Slit Experiment, the second order maximum occurs at  $\theta = 0.25^\circ$ . The Wavelength is 650 nm. Calculate the Slit Separation. (3)

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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 number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Q.No.1	Number of Steradians in a Solid Sphere is : (1) (A) $\pi$ (B) $2\pi$ (C) $4\pi$ (D) $\frac{\pi}{2}$
(2)	The Chips are made of : (A) Carbon (B) Germanium (C) Gold (D) Silicon
(3)	Angle between two vectors $3\hat{i} + 4\hat{j}$ and $4\hat{i} - 3\hat{j}$ is : (A) $30^\circ$ (B) $90^\circ$ (C) $60^\circ$ (D) $45^\circ$
(4)	Forces 12 N and 5 N are added, the resultant can not be : (A) 13 N (B) 7 N (C) 6 N (D) 17 N
(5)	Original Source of Energy for Biomass is : (A) Earth (B) Moon (C) Sun (D) Star
(6)	The unit of Solar Constant is : (A) $\text{kWm}^{-2}$ (B) $\text{kWm}^2$ (C) $\text{kWm}$ (D) $\text{kWm}^{-1}$
(7)	Angular Momentum has the same unit as : (A) Impulse x Distance (B) Power x Time (C) Linear Momentum x time (D) Work x Frequency
(8)	If the Radius of Earth is increased to four times of the present. Critical Velocity $V_0$ becomes : (A) $\frac{V_0}{\sqrt{2}}$ (B) $\sqrt{2} V_0$ (C) $2 V_0$ (D) $\frac{1}{2} V_0$
(9)	The law of conservation of energy is the basis of : (A) Equation of Continuity (B) Bernoulli's Equation (C) Venturi Relation (D) Interference
(10)	Beats can be heard when difference of frequencies is not more than : (A) 8 Hz (B) 10 Hz (C) 2 Hz (D) 4 Hz
(11)	The Wave form of Simple Harmonic Motion is : (A) Sine Wave (B) Cosine Wave (C) Tangent Wave (D) Saw Tooth Wave
(12)	On Reflection of Longitudinal Waves from denser medium, there will be phase change of : (A) $\pi$ rad (B) $2\pi$ rad (C) Zero (D) $\frac{\pi}{2}$ rad
(13)	The angle between the Ray of Light and Surface of the Wave Front is : (A) $60^\circ$ (B) $30^\circ$ (C) $180^\circ$ (D) $90^\circ$
(14)	A glass grating has 5000 lines/cm then grating element will be : (A) $2 \times 10^{-6}$ m (B) $2 \times 10^{-4}$ m (C) $2 \times 10^{-3}$ m (D) $2 \times 10^{-7}$ m
(15)	Critical Angle is that angle of incidence for which angle of refraction is : (A) $90^\circ$ (B) $45^\circ$ (C) $42^\circ$ (D) $24^\circ$
(16)	No Spark Plug is needed in : (A) Carnot Engine (B) Petrol Engine (C) Steam Engine (D) Diesel Engine
(17)	Force Acting on the Piston to move outward is : (A) Compressive Stroke (B) Power Stroke (C) All Strokes (D) Exhaust Stroke





Roll No.	810 - 22000	New Pattern ( Group 2nd )
Physics (Subjective)	Inter-A-2018	Inter ( Part - I )
Time = 2 : 40 Hours	Total Marks : 68	Session ( 2015 - 17 ) to ( 2017 - 19 )

Note : It is compulsory to attempt ( 8 - 8 ) parts each from Q.No.2 and Q.No. 3 while attempt any (6) parts from Q. No.4 and attempt any (03) questions from Part II. Write same Question No. and its Part No. as given in the question paper.

## Bahawalpur Board-2018

Part - I

22 x 2 = 44

Q.No.2 (i) Why do we find it useful to have two units for the amount of substance, the kilogram and the mole?

(ii) How many years in one Second?

(iii) Define Radians and Steradian.

(iv) Show that the Einstein Equation  $E = mc^2$  is dimensionally consistent.

(v) What is the Unit Vector in the direction of the vector  $\vec{A} = 4\hat{i} + 3\hat{j}$ ?

(vi) Name the two different conditions that could make  $\vec{A} \times \vec{A} = 0$

(vii) Define Resultant Vector and Null Vector.

(viii) Define Impulse and Show that how it is related to Linear Momentum?

(ix) Define Elastic and Inelastic Collisions.

(x) What is meant by Linear Momentum? Also give its S.I. Unit.

(xi) Why Fog Droplets appear to be suspended in air?

(xii) Explain how the Swing is produced in the fast moving cricket ball?

Q.No.3 (i) An object has 1 Joule of Potential Energy. Explain what does it mean?

(ii) When rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from?

(iii) Define Joule and Watt.

(iv) What is meant by Moment of Inertia? Explain its significance.

(v) Show that Orbital Angular Momentum  $L_o = mvr$

(vi) Prove that 1 Radian =  $57.3^\circ$

(vii) Can we realize an Ideal Simple Pendulum?

(viii) What do you mean by Phase?

(ix) Define Restoring Force and Simple Harmonic Motion.

(x) What features do Longitudinal Waves have in common with Transverse Waves?

(xi) What is the effect of Pressure on the Speed of Sound in Gases?

(xii) State the principle of Superposition.

Q.No.4 (i) Differentiate between Constructive and Destructive Interference.

(ii) Why the Polaroid Sunglasses are better than ordinary Sunglasses?

(iii) Can you obtain Newton's rings with transmitted light? If yes, would the pattern be different from that obtained with reflected light?

(iv) An Astronomical Telescope has an objective and eye piece of Focal Length 100 cm and 5 cm respectively. Calculate its angular magnification.

(v) Define Total Internal Reflection and Critical Angle.


(vi) Specific Heat of a Gas at constant pressure is greater than the specific heat at constant volume, why?

(vii) Can the efficiency of a Carnot Engine 100%? Explain.

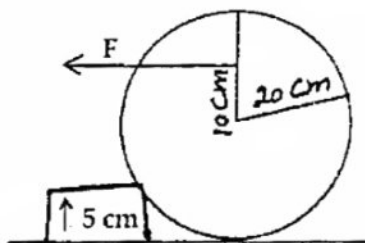
(viii) Is it possible to convert internal energy into mechanical energy? Explain with an example.

(ix) Does the Entropy of a system increase or decrease due to friction? Explain.



Q.No.5 (a) Prove that the Total Linear Momentum of an Isolated System remains constant.  (5)

(b) A spherical ball of weight 50 N is to be lifted over the step as shown in the given figure. Calculate the minimum force needed just to lift it above the floor. (3)



Q.No.6 (a) What are Geostationary Orbits? Derive an expression for the orbital radius of Geostationary Satellite. (5)

(b) How large a force is required to accelerate an electron of mass  $9.1 \times 10^{-31}$  Kg from rest to a speed of  $2.0 \times 10^7 \text{ ms}^{-1}$  through a distance of 5.0 cm? (3)

Q.No.7 (a) State and Derive the Equation of Continuity. (5)

(b) A Heat Engine performs 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) What is Simple Pendulum? Show that its motion is SHM. Derive an expression for its time period. (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) What is Simple Microscope? Describe its construction, working and derive expression for its magnification. (5)

(b) Sodium light ( $\lambda = 589 \text{ nm}$ ) is incident normally on a grating having 3000 lines per centimetre. What is the highest order of the spectrum obtained with this grating? (3)