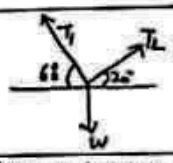
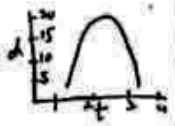
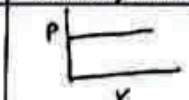
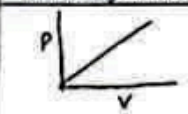
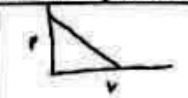
Paper Code Number:	2024 INTERMEDIATE PART-I (11th Class)	Roll No:

PHYSICS PAPER-I MODEL PAPER

TIME ALLOWED: 20 Minutes	OBJECTIVE	MAXIMUM MARKS: 17

Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

S.#	QUESTIONS	A	B	C	D
1	A measurement taken by vernier caliper with L.C 0.01 cm is recorded as 0.45 cm. The percentage uncertainty in the measurement is:	2.0 %	0.02	2×10^{-2}	20 %
2	Dimensions of force and volume are:	$[MLT]$ and $[M^0L^3T^0]$	$[MLT^{-2}]$ and $[L^3]$	$[LAMT]$ and $[MLT^{-2}]$	$[M^{-1}L^1T^2]$ and $[MLAT^{-2}]$
3	Would you compare the tensions in the given figure: 	$T_1 = 60N$, $T_2 = 20N$	$T_1 = T_2$	$T_1 > T_2$	$T_2 > T_1$
4	What would be the correct answer when two forces are combined 600N and 350N?	1000N	200N	960N	700N
5	How the displacement of vertically thrown ball varies with time as shown in figure? 	1st increase then decrease	1st decrease then increase	1st increase then constant	1st decrease then decrease
6	When a massive body (M_1) suffers elastic collision with light stationary body (M_2) then the maximum change in the final velocity of M_2?	One time	Two times	Three times	Four times
7	The net loss in work done when angle between F and d changes from 0° to 45°:	0%	14%	30%	50%
8	The ratio of rotational KE of disc to hoop is:	1 : 4	1 : 8	1 : 3	1 : 2
9	A rod, hoop and a disc are revolving in a circle of very large radius then their moment of inertia are"	Same	$\frac{1}{2}mr^2, \frac{1}{5}mr^2, \frac{3}{4}mr^2$	$\frac{1}{12}ML^2, mr^2, \frac{1}{2}mr^2$	$\frac{2}{5}mr^2, mr^2, \frac{1}{4}mr^2$
10	The correct conversion factor between torr and Nm^{-2}:	$1torr = 1.33Nm^{-2}$	$0.1torr = 13.33Nm^{-2}$	$10torr = 1.3Nm^{-2}$	$1Nm^{-2} = 1torr$
11	Energy in S.H.M is proportional to:	Displacement	Amplitude	Square of amplitude	Zero
12	A point on a wave at a distance x, 1st crest of the wave lags behind by phase angle ϕ equal to:	$\sqrt[3]{\frac{2\pi}{\lambda}}$	$\left(\frac{2\pi}{\lambda}\right)^x$	$\left(\frac{2\pi}{\lambda}\right)\left(\frac{1}{x}\right)$	$\left(\frac{2\pi}{\lambda}\right)x$
13	When fringe spacing is increased by increasing the wavelength then number of fringes are:	Increased	Decreased	Constant	1st increase and then decrease
14	The number of beats per second depend on:	Frequency of one wave	Frequency of 2nd wave	Frequency difference	None of these
15	In compound microscope, blue light is used to produce:	More diffraction	More intensity of light	Less diffraction	Less intensity of light
16	Thermal pollution is an inevitable consequence of:	3rd law of thermodynamics	Zeroth law of thermodynamics	1st law of thermodynamics	2nd law of thermodynamics
17	In which graphical representation, there is zero work done:				

INTERMEDIATE PART-II (11th Class)	2024	Roll No:
PHYSICS PAPER-I	MODEL PAPER	
TIME ALLOWED: 2.40 Hours	SUBJECTIVE	MAXIMUM MARKS: 68

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. $8 \times 2 = 16$

(i)	Why do we find it useful to have two units for the amount of substance, the kilogram and mole?
(ii)	Give the drawbacks to use the period of a pendulum as a time standard.
(iii)	Analyse precision and accuracy briefly with one example.
(iv)	How you are going to prove the homogeneity in $v = f\lambda$?
(v)	Name the three different conditions that could make $\vec{A_1} \times \vec{A_2} = \vec{0}$.
(vi)	If $\vec{A} + \vec{B} = \vec{0}$, what can you say about the components of the two vectors?
(vii)	Draw a diagram and a valid reason of a concurrent force system.
(viii)	Does a moving object have impulse? Give at least one valid reason to support your answer.
(ix)	Show that range of projectile is maximum when projectile is thrown at an angle of 45° with the horizontal.
(x)	At what point or points in its path does a projectile have its minimum speed, its maximum speed? Use diagram to support your answer.
(xi)	An object has 1J of potential energy. Explain what does it mean?
(xii)	How would you analyse loss and gain of energy in law of conservation of energy?

3. Attempt any eight parts. $8 \times 2 = 16$

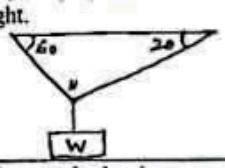
(i)	How do you prove that centripetal force performs no work? Use mathematical steps to support your answer.
(ii)	When mud flies off the tyre of a moving bicycle, in what direction does it fly? Explain with a valid reason.
(iii)	How would your elaborate the difference between real and apparent weight?
(iv)	What is meant by moment of inertia and its significance? Elaborate with the help of equations.
(v)	Two row boats moving parallel in the same direction are pulled towards each other. Explain.
(vi)	How would you analyse Torricelli's and Venturi's relation with their equations.
(vii)	What do you understand by the term "resonance sharpness" support your answer with a graph.
(viii)	Can we realize an ideal simple pendulum?
(ix)	Describe some common phenomena in which resonance plays an important role.
(x)	Analyse the patterns of interference and beats for sound waves.
(xi)	How astronomers use Doppler effect to calculate the speeds of distant stars and galaxies?
(xii)	Why sound travels faster in warm air than in cold air?

4. Attempt any six parts. $6 \times 2 = 12$

(i)	How would you analyse fringe spacing in Young's double slit experiment?
(ii)	An oil film spreading over a wet footpath shows colours. Explain how does it happen?
(iii)	How would you manage to get more orders of spectra using a diffraction grating?
(iv)	Why could it be advantageous to use blue light with a compound microscope?
(v)	How the power is lost in optical fibre through dispersion? Explain.
(vi)	Analyse the benefits of optical fibre to humanity.
(vii)	How would you describe the working of heat engine?
(viii)	Does entropy of a natural process increase or decrease? Explain it.
(ix)	Why does the pressure of a gas in a car tyre increase when it is driven through some distance?

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)	How would you analyze horizontal and vertical component of velocity for projectile motion. Use vertical component of velocity for deriving a relation for its height.	2+3=5
(b)	A load is suspended by two cords as shown in figure. Determine the maximum load that can be suspended at point N, if maximum breaking stress of the cord is 50N. 	3
6.(a)	Derive relations for quantization of frequencies of stationary waves in stretched string.	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
7.(a)	How would you create artificial gravity in a space ship and derive a relation for its frequency, also analyze the relation logically?	1+3+1=5
(b)	A simple pendulum is 50cm long. What will be its frequency of vibration at a place where $g = 9.8ms^{-2}$.	3
8.(a)	Draw the story of all thermodynamic processes used in Carnot Engine in a graph. Briefly explain all steps and derive a relation for efficiency of Carnot Engine. Also state Carnot's theorem.	1+2+1+1=5
(b)	What gauge pressure is required in the city mains for a stream from a fire hose connected the mains to reach a vertical height of 15.0m.	3
9.(a)	Give an analysis in working of Michelson's interferometer by fixing vertical mirror M_1 and varying the position of horizontal mirror M_2. Also give application of interferometer and analyse the formula for calculation of wavelength of light.	1+3+1=5
(b)	A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least 39°. What is the minimum angle for total internal reflection if pipe is in water? (refractive index of water = 1.33)	3