ANSWER KEY

..FIRST.... YEAR HIGHER SECONDARY EXAMINATION MARCH 2026

PART-I/II/III

SUBJECT: .....PHYSICS.....

CODE NO: ..FY..124 VERSION:...A...

..60.. SCORES .....2.. HOURS

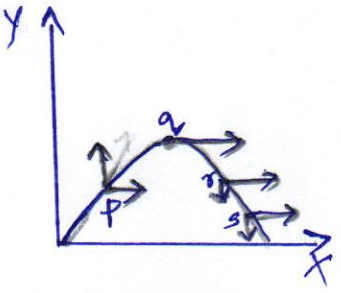
Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		Section A		
1		Zero		1
2		b) Impulse		1
3		seconds Pendulum		1
4		c) Temperature		1
5		d) Bangle		1
6		True		1
7		b) $f = \frac{v}{\lambda}$		1
		Section B		
8		statement of Moment of inertia or equation (1 mark)	1	2
		Any two factors on which inertia depends (1 mark)	1	
9		Displacement = Area under velocity-time graph (1 mark) $S = ut + \frac{1}{2}(v-u)t$ ($\frac{1}{2}$ mark) ($\frac{1}{2}$ mark) OR Derevation of $S = ut + \frac{1}{2}at^2$ using graph (2 marks)	2	2

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10		Mean free path - Average distance travelled by a molecule between two consecutive collision	1	2
		equation $l = \frac{1}{\sqrt{2}\, n \pi d^2}$	1	
		where d - diameter of gas molecules n - number density of gas molecules		
11		A — B a) - r) N/m b) - p) J/m^2 c) - s) N/m^2 d - q) m	½ ½ ½ ½	2
12		Heat engine - Device that converts thermal energy (heat energy) into mechanical energy OR Heat into work / OR Any related attempt OR W 	2	2
13		Definition of escape speed	1	2
		$V_0 = \sqrt{\frac{GM}{R}}$ $V_e = \sqrt{\frac{2GM}{R}} = \sqrt{2}\, V_0$	1	
		OR $V_0 = \sqrt{\frac{GM}{R}}$ ($\frac{1}{2}$ mark) $V_e = \sqrt{\frac{2GM}{R}}$ ($\frac{1}{2}$ mark) OR $V_e = \sqrt{2}\, V_0$ ($\frac{1}{2}$ mark		

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14		Definition of power / equation $1\ kWh = 1000 \times 3600 = 3.6 \times 10^6\ J$	1 1	2
		Section C		
15	a)	Definition of unit of a physical quantity	1	
	b	$[L] = c[T^2]$ (1 mark) $c = \frac{[L]}{[T^2]}$ unit of $c = m/s^2$ (1 mark) OR $m = c\,s^2$ (1 mark) $c = m s^{-2}$ (1 mark) OR unit of $c = m/s^2$ (2 mark)	2	3
16	a)	Definition of modulus of elasticity SI unit – Pa or Nm^{-2} Dimension – $ML^{-1}T^{-2}$	1 $\frac{1}{2}$ $\frac{1}{2}$	3
	b)	Definition of elastomer or Graph of elastomer ($\frac{1}{2}$ mark) Example of elastomer ($\frac{1}{2}$ mark)	1	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
17		$\nu_1 = \frac{V}{\lambda} = \frac{3V}{4l}$ (1 mark) $\nu_2 = \frac{V}{\lambda} = \frac{5V}{4l}$ (1 mark) $\therefore \frac{\nu_1}{\nu_2} = \frac{3V}{4l} \times \frac{4l}{5V} = \frac{3}{5} = 3:5$ (1 mark) OR $\nu_1 : \nu_2 = 3:5$ (1 mark)	3	3
18	a)	Any related attempt	1	3
	b)	statement of Ist law / $\Delta Q = \Delta U + \Delta W$ (1 mark) Explanation for conservation of energy / Law of conservation of energy (1 mark)	2	
19	a)	$\vec{A} \times \vec{B} = AB \sin\theta \hat{n}$ OR Definition	1	3
	b)	$F = \sqrt{F_1^2 + F_2^2 + 2F_1F_2\cos\theta}$ (1 mark) $= \sqrt{25+49+2\times5\times7\cos60}$ ($\frac{1}{2}$ mark) $= \sqrt{109}$ N ($\frac{1}{2}$ mark) OR $F = 10.44$ N ($\frac{1}{2}$ mark)	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
20		Definition of Conservative force Definition of Non-conservative force Examples : ½ mark for each	1 1 1	3
21	a)	statement (1 mark) $\tau = \frac{dL}{dt}$ ($\frac{1}{2}$ mark) If $\tau = 0$, $\frac{dL}{dt} = 0$ or L = a constant ($\frac{1}{2}$ mark)	2	3
	b	i) Angular velocity decreases (½) (ii) Angular velocity increases (½)	1	
22		Section D		
	a)	Definition of heat (1 mark) Definition of temperature (1 mark)	2	4
	b)	$F = \frac{9}{5}C + 32$ (1 mark) $F = \frac{C}{2}$ $\therefore \frac{C}{2} = \frac{9}{5}C + 32$ $C = -24.6^{\circ}C$ (1 mark) $\therefore F = -12.3^{\circ}F$	2	
23	a	Statement of Newtons II Law (1 mark) Definition of 1 N (1 mark) or $F = ma$ ($\frac{1}{2}$ mark)	2	4
	b	Lift moving up $R = mg + ma$ But $a = 2g$ $\therefore R = mg + 2mg = 3mg$	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
24	a)	Definition of SHM / equation of SHM	1	4
	b)	Energy position graph	2	
	c)	i) 1 Hz (½ mark)	1	
		ii) 2 unit / 2 cm (½ mark)		
25	a)	Definition of Displacement (1 mark)	2	4
		Definition of Distance (1 mark)		
	b)	i) Distance = 4 km	2	
		ii) Displacement = 0		
26		Section E		5
	a)	Definition of g / equation of g	1	
	b)	$g = \frac{GM}{R^2} = \frac{6.67\times10^{-11}\times6\times10^{24}}{(6400\times10^3)^2} = 9.8\ m/s^2$	1	
	c)	Proof $g' = g\left(1-\frac{2h}{R}\right)$	3	
		OR Proof $g = \frac{GM}{(R+h)^2}$		
27	a	Definition of projectile	1	5
	b	 (½ each)	2	
	c	Proof $T = \frac{2u\sin\theta}{g}$	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
28	a)	Definition	1	
	b)	Derivation of $h = \frac{2S\cos\theta}{r\rho g}$ OR figure only ($\frac{1}{2}$ mark)	2	
	c)	$h = \frac{2S\cos\theta}{r\rho g}$ $= \frac{2\times 0.456\times \cos 140}{2\times 10^{-3}\times 13.6\times 10^{3}\times 9.8}$ $= -0.00262\ m$ $= -2.62\times 10^{-3}\ m$	2	5
29	a)	Statement of Hooke's law	1	
	b)	Proof $E = \frac{1}{2}kx^2$ (any method)	2	
	c	workdone = Energy stored $u = \frac{1}{2}kx^2$ $F = mg = 5\times 9.8 = 49\ N$ $F = kx$ $\therefore k = \frac{49}{0.5\times 10^{-2}} = 9800\ N/m$	2	5

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		$\therefore U = \frac{1}{2} \times 9800 \times (0.5 \times 10^{-2})^2$ $U = 0.122$ J OR Workdone $= \frac{1}{2} F \times \Delta l = \frac{1}{2} mg \times \Delta l$ $= \frac{1}{2} \times 5 \times 9.8 \times 0.5 \times 10^{-2}$ $= 0.122$ J		

1 MUHAMMED IRSHAD. P HSST Physics, 9447793915

2. PRAVEEN KUMAR. C, GHSS Thayannur 9847497951

3. JIJESH. K. K ST. MICHAEL's AIHSS KANNUR 9895226657

4 INDUSHA. N.S, GVHSS Chottanikkara 9496464969

5 PRINCY. K, SNHSS, POOCHAKKAL, 7012417550

6 Subas. A. Jose, GHSS MANATHALA, 9447902281

7. Sujish. K Thomas, Sarvodayam VHSS Aryampadam, 9447610627