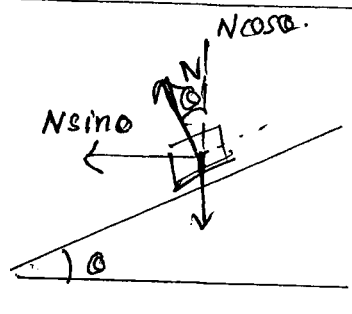


ANSWER KEYFIRST YEAR HIGHER SECONDARY ^{IMPVT} EXAMINATION October 2022

PART-I/II/III

SUBJECT: PHYSICSCODE NO: FY 824VERSION: D60 SCORES2 HOURS

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1		Zero	1	1
2		(b) Distance	1	1
3		Statement / stress \propto strain / $\frac{\text{stress}}{\text{strain}} = \text{a constant}$	1	1
4		Pascal's law	1	1
5		Process of transition of solid state to vapour state without passing through liquid state / solid \rightarrow vapour	1	1
6		False	1	1
7		Torque is zero, angular momentum is a constant / $L = \text{a constant}$	1	1
8		Four fundamental forces ($4 \times \frac{1}{2}$)	2	2
9		Definition or equation (1) Definition or equation (1)	2	2
10		work energy theorem statement / equation	2	2
11		Definition / Figure	2	2
12		Explanation based on conduction	2	2
13		statement / Equation ($E = \frac{1}{2} K_B T$)	2	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
14		$v = c \sqrt{\frac{T}{\mu}} \quad / \quad v = \sqrt{\frac{T}{\mu}} \quad / \quad v = \sqrt{\frac{T}{m}}$	2	2
15		$\frac{\Delta x}{x} \times 100 = 2 \left(\frac{\Delta a}{a} \times 100 \right) + 3 \left(\frac{\Delta b}{b} \times 100 \right) + \left(\frac{\Delta c}{c} \times 100 \right) + \frac{1}{2} \left(\frac{\Delta d}{d} \times 100 \right) \quad (1)$ $= 2 \times 4\% + 3 \times 2\% + 3\% + \frac{1}{2} \times 1\%$ $= 8\% + 6\% + 3\% + 0.5\% \quad (1)$ $= 17.5\% \quad (1)$	3	3
16		<p>Derivation of</p> <p>(i) $x = v_0 t + \frac{1}{2} a t^2$</p> <p>(ii) $v^2 = v_0^2 + 2as$</p> <p>} any method $1\frac{1}{2}$ $1\frac{1}{2}$</p>	3	3
17		<p>Statement of Newton's Second law (1)</p> <p>Proof</p> <p>$F \propto \frac{dp}{dt}$ (1 mark)</p> <p>$F \propto m \frac{dv}{dt}$</p> <p>$F \propto ma$</p> <p>$F = ma$ (1 mark)</p>	3	3
18		<p>$N \cos \theta = mg + f \sin \theta \quad (1)$</p> <p>$N \sin \theta + f \cos \theta = \frac{mv^2}{R} \quad (1)$</p> <p>$V_{max} = \sqrt{Rg \left(\frac{\mu_s + \tan \theta}{1 - \mu_s \tan \theta} \right)} \quad (1)$</p> <p>or figure only (1)</p> 	3	3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
22		Derivation $K = \frac{1}{2}mv^2 \quad (1)$ $V = \int u \, dl \quad (1)$ $\text{Kinetic energy} = \frac{1}{2} I u^2 \quad (1)$	3	3
23		Derivation of $H = \frac{V_0^2 \sin^2 \theta}{2g} \quad (2)$ $T = \frac{2V_0 \sin \theta}{g} \quad (2)$ OR Figure only (1 score)	4	4
24		(a) Statement (1 score) (b) Proof (3 score)	4	4
25		Statement / equation (2 score) Proof (2 score)	4	4
26		Explanation (i) Isothermal expansion 1 (ii) adiabatic expansion 1 (iii) Isothermal compression 1 (iv) adiabatic compression 1 OR Figure with name of process (4 score)	4	4

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
27		First harmonic $\lambda_1 = \frac{V}{2L}$ or diagram (1) Second harmonic $\lambda_2 = \frac{V}{L}$ or diagram (1) Third harmonic $\lambda_3 = \frac{3V}{2L}$ or diagram (1) $\lambda_1 : \lambda_2 : \lambda_3 = 1 : 2 : 3$ (1)	3 1	4
28	a b	Correct definition (2) Derivation of centripetal acceleration OR Figure only (1) OR $a = r\omega^2$ / $a = v\omega$ (1)	2 3	5
29	a b	law of static friction (2) $f_s = ma$ (1) $a_{max} = \mu_s g$ (1) $a_{max} = 1.5 \text{ m/s}^2$ (1)	2 3	5
30	a b	statement / equation Any related answer	2 3	5

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
31	a	<p>Derivation</p> $g = \frac{GM}{R^2} \quad (1)$ $g' = \frac{GM}{(R+h)^2} \quad (1)$ $g' = g \left[1 - \frac{2h}{R} \right] \quad (1)$	3	5
	b	<p>Let 'h' be the height at which g is same as that at depth 'd'</p> $g(h) = g(d)$ $g \left(1 - \frac{2h}{R} \right) = g \left(1 - \frac{d}{R} \right)$ $\frac{2h}{R} = \frac{d}{R} \quad h = \frac{d}{2} = \frac{80}{2} = 40 \text{ km}$ <p>OR</p> <p>Any one equation, g_h or g_d (1)</p>	2	
32	a	<p>Derivation of $T = 2\pi \sqrt{\frac{l}{g}}$</p> <p>diagram (1)</p> <p>final equation only (1)</p>	4	5
	b	<p>length of second pendulum = 1 m</p>	1	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
1.	Sebastian Mathew	9447521892	2	
2.	Ranjith RD	9526966472 RD		
3.	Dinesh Kumar. K	9961281960	2	
4.	Rajeev P-V-T	8075041521	2	
5.	Amritheshm	9946664347	2	
6.	SUOMEER. CV	9495707565	2	
7.	LEENA PHILIP	9497615905	2	
8.	Asa. K. Revi	9447105317	2	
9.	DY. Remyith JS	9447354328	2	
10.	Vinil Kumar. T	9447183149	2	
11.	Mangin. G. P	9946330275	2	
12.	SOUTHSON SOSEPA	9447214875	2	