ANSWER KEY

FIRST ..... YEAR HIGHER SECONDARY EXAMINATION ..... MARCH 2024

PART-I/II/III

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

CODE NO: ..F.Y..424 VERSION:.....

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

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		Section - A		
1		(c) $M^{-1}L^{3}T^{-2}$	1	
2		(b) $\frac{1}{2}MR^2$	1	
3		(d) $\frac{4S}{R}$	1	
4		(b) First law in thermodynamics	1	5
5		True	1	
6		$a \propto -x$ / $F \propto -x$ / $F = -kx$ / $\frac{d^2x}{dt^2} + \omega^2 x = 0$ / Statement	1	
7		The waxing and waning of intensity of sound due to the interference of two sound waves of close frequencies.	1	
		Section - B		
8		Two uses (1+1 Score)	2	2
9		(i) 4 (1 Score) (ii) 3 (1 Score)	2	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
10		Derivation (Any method)		2
11		Definition or Power = $\frac{\text{Work}}{\text{Time}}$ or Power = Force x velocity (1 Score) Unit watt(W) or J/Sec (½ Score) Dimension ML^2T^{-3} (½ Score)		2
12		Explanation / Graphical Explanation		2
13		Statement or $-\frac{dQ}{dt} \propto (T_2 - T_1)$ (Sign is not necessary) (1 Score)		2
14		$C_V = \frac{5}{2}R$ (1 Score) $C_p = \frac{7}{2}R$ (1 Score) or $C_p = C_V + R$ (1 Score)		2
15		Section - C Statement (2 Score) Explanation (1 Score)		

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
		or figure (1½ Score) $R = \sqrt{P^2+Q^2+2PQ\cos\theta}$ (1 Score)		3
16.		Statement (1 Score) Derivation of $F=ma$ (2 Score)		3
17		Three laws (1 Score each) or figure or equation (½ Score each)		3
18		Explanation / $Y = \frac{\text{linear stress}}{\text{linear strain}}$ / $Y = \frac{FL}{Al}$ (2 Score) Unit Nm^{-2} or Pa (1 Score)		3
19		Figure (1 Score) Working / based on Pascal's law (1 Score) $F_2 = \frac{A_2}{A_1} \times F_1$ (1 Score)		3

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
20		$U = \frac{1}{2}kx^2$ / $U = \frac{1}{2}m\omega^2x^2$ / using sinusoidal functions (1 Score) $K = \frac{1}{2}k(A^2 - x^2)$ / $K = \frac{1}{2}m\omega^2(A^2 - x^2)$ / using sinusoidal functions (1 Score) Graph (1 Score)		3
21		Speed of longitudinal wave is, $v = \sqrt{\frac{E}{\rho}}$ / $v = \sqrt{\frac{Y}{\rho}}$ / $v = \sqrt{\frac{B}{\rho}}$ / $v = \sqrt{\frac{\gamma P}{\rho}}$ (2 Score) $V = 331\ ms^{-1}$ or $331.3\ ms^{-1}$ (1 Score)		3
22	a	Section - D Statement (2 Score) or Equation (1 Score)	2	4
	b	Elastic Collision (1 Score) Inelastic Collision (1 Score) or Definition of collision (1 Score)	2	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
23	a.	(i) Definition (1 Score) $\vec{\tau} = \vec{r} \times \vec{F}$ (½ Score) (ii) Definition (1 Score) $\vec{L} = \vec{r} \times \vec{p}$ (½ Score)	3	4
	b	Relation (1 Score)	1	
24	a.	Definition	1	4
	b.	Derivation of $v_e = \sqrt{\frac{2GM}{R}} = \sqrt{2gR}$	3	
25	a.	Definition / Equation (1 Score each)	2	4
	b	Derivation (2 Score) or Final Equation only (1 Score)	2	
26		Section-E		5
	a.	Graph	1	
	b.	Any two significance / use	2	
	c.	Derivation (2 Score) or Graph (1 Score)	2	

Qn. No	Sub Qns	Answer Key/Value Points		Score	Total Score
27	a.	Derivation or Final equation	(1 Score)	2	
	b.	$R = \frac{u^2 \sin 2\theta}{g}$	(1 Score)		
		$R = \frac{28^2 \sin 60}{9.8} = 69\,m$	(1 Score)	2	5
		or Final answer only	(½ Score)		
	c.	$\theta = 45^\circ$	(1 Score)	1	
28	a.	Statement	(1 Score)	2	
		Proof (Any Method)	(1 Score)		
	b.	Explanation / Definition	(1 Score)	2	5
		Different Types	(1 Score)		
	c.	Zero	(1 Score)	1	

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total Score
29.	a.	Explanation	1	5
	b.	Statement / Equation	2	
	c.	Explanation / $F = 6\pi\eta a v$ (1 Score)		
		$\eta = \frac{\text{Stress}}{\text{Strain Rate}}$ / $\eta = \frac{Fl}{Av}$ (1 Score)	2	

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