

FIRST YEAR HIGHER SECONDARY EXAMINATION SAY/IMP SEPTEMBER 2016

(Scheme of Valuation)

Subject : Physics

Code No. 415

Qn. No	Scoring Indicators	Split Score		Total Score
		Score	Score	
1.	c) Strong nuclear force.	1	1	
2. a.	$\frac{\Delta A}{A} \times 100 = \frac{\Delta l}{l} \times 100 + \frac{\Delta b}{b} \times 100$ $\frac{\Delta A}{A} \times 100 = 4.3\%$ <p>[Result only give 1 mark]</p>	1	1	
		<p>b.</p> <p>Dimension of LHS = <math>M^0 L^0 T^{-1}</math></p> <p>Dimension of RHS = <math>M^0 L^0 T^{-1}</math></p> <p>OR</p> <p>Dimensions of any two quantities in the equation give 1 mark</p> <p>[LHS] ≠ [RHS] ∴ Equation is not correct</p>	$\frac{1}{2}$	$\frac{1}{2}$
3. a.	iii) BC	1		
	b. ems $\times 55 = 30m$	1		
	<p>[Graph is not marked correctly, So give 1 mark for related attempt.]</p> <p><math>S = V_0 t + \frac{1}{2} a t^2</math></p> <p><math>h = \frac{1}{2} \frac{g t^2}{2h}</math></p> <p><math>t = \sqrt{\frac{2h}{g}}</math></p> <p><math>h = \frac{1}{2} g t^2 - 1</math> score, Final answer-1 score</p>	1	$\frac{1}{2}$	$\frac{1}{2}$

$\frac{1}{6}$



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4	a.	ii) work	1	
	b.	Draw parabolic path mark direction of velocity mark direction of acceleration	1	
	c.	$V^2 = V_0^2 + 2as$ $0 = V_0^2 \sin^2 \theta - 2gH$ $\therefore H = \frac{V_0^2 \sin^2 \theta}{2g}$ [Final equation only give 1 mark]	1 1 1 1 1	5
5	a.	Concurrent Forces / Concurrent	1	
	b.	$F_3 = \sqrt{F_1^2 + F_2^2 + 2F_1F_2 \cos \theta}$ Mass of Stone = $\sqrt{150^2 + 100^2} + 0$ Mass of Stone = $180.3 \times 10^{-3}$ kg [Give full score for weight also] [Give mark if angle is taken as 30° also] [Can be solved using Parallelogram method] [Final result only give 1 mark]	1 1 1 1	3
6	a.	Normal reaction $N = mg$ $\mu_s mg = \frac{mV_{\max}^2}{R}$ $V_{\max} = \sqrt{\mu_s Rg}$	1 1 1	
	b.	Any one reason	1	3

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c.	$I = \frac{3MR^2}{2}$ Moment of inertia	1	5
9 a.	Statement of law or equation	1	
b.	$\frac{mv_c^2}{R+h} = \frac{GMm}{(R+h)^2}$	1	
	$v_c = \sqrt{\frac{GM}{R+h}} \text{ or } \sqrt{\frac{GM}{R}}$	1	
c.	$v_e = \sqrt{2gR}$	$\frac{1}{2}$	5
	$v_o = \sqrt{gR}$	$\frac{1}{2}$	
	$v_o = \frac{v_e}{\sqrt{2}} = \frac{20}{\sqrt{2}}$ $v_o = 14.14 \text{ km/s}$ <p>[Last two steps give 2 mark]</p>	$\frac{1}{2}$	
10 a.	iv) Rigidity modulus	1	2
b.	Statement of law	1	
11 a.	273.16 K OR 273.01 K	1	3
b.	Correct explanation [convection only 1 mark]	2	
12A a.	Av = constant	1	
b.	Figure	1	
	$W_1 - W_2 = (P_1 - P_2) \Delta V$ Change in KE Change in PE	$\frac{1}{2}$	

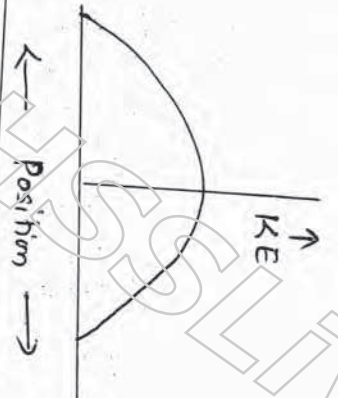




Qn.No	Scoring Indicators	Split Score	Total Score
c.	$P + \frac{1}{2} \rho v^2 + \rho g H = \text{constant}$ $v = \sqrt{2gh}$ [Theorem only - 1 mark] $v = 7.66 \text{ m/s}$ OR Explain / Define Surface tension Figure	1 1 1 1 1 1	7
12 B a.	$P_i - P_o = \frac{2S \cos \theta}{a}$ $P_i - P_o = h \rho g$ $h = \frac{2S \cos \theta}{\rho g}$	1 1 1	3
c.	$\Delta P_{\text{bubble}} = 2 \times \Delta P_{\text{Drop}}$ $\Delta P_{\text{bubble}} = 2 \times 60 = 120 \text{ N/m}^2$ $\left[ \Delta P_{\text{bubble}} = \frac{4S}{r} - \frac{1}{2} \right], \Delta P_{\text{Drop}} = \frac{2S}{r} \cdot \frac{1}{2}$ [Final Answers only - 2 marks]	1 1 1	3
13 a.	Any one difference	1	1
b.	Explanation of four process or explanation using correct graph. Name of four process only <small>at 1 mark</small> Graph only - 1 mark	2	2
c.	$\eta = 1 - \frac{T_2}{T_1}$ or $\eta = 1 - \frac{Q_2}{Q_1}$	1	4



Scoring Indicators

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14.	<p>Explanation or definition of mean free path.</p> <p>Any one factor (diameter of molecule, number density, Pressure, Temp etc)</p> <p><math>\lambda = \frac{1}{n\pi d^2}</math> or <math>\lambda = \frac{1}{\sqrt{2}n\pi d^2}</math> -1mark</p>	1	2
15. a.	<p>Definition or equation</p> <p><math>a = -\omega^2 x</math></p> <p><math>\omega = \frac{2\pi}{T}</math></p> <p><math>a = -0.986 \text{ m/s}^2</math></p>	1	4
b.		1	
c.	<p><math>v' = v \frac{(v - v_L)}{v}</math></p> <p><math>v' = 474 \text{ Hz}</math></p> <p>Doppler effect</p> <p>Diagram</p> <p>mark node</p> <p>mark antinode</p>	1	4

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