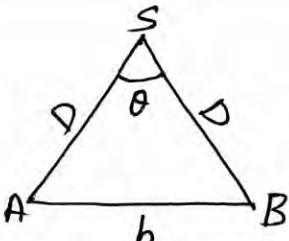






Qn No	Sub Qns	Answer Key/Value Points	Score	Total
9	(a)	 <p>Here <math>\theta = \frac{b}{D}</math> or <math>D = \frac{b}{\theta}</math></p>	1	2
	(b)	<p><math>[m] = [M]</math>  <math>[v] = [LT^{-1}]</math>  <math>[g] = [LT^{-2}]</math>  <math>[h] = [L]</math></p> <p>Any three correct <sup>Dimension</sup> eqn give <math>1\frac{1}{2}</math> marks  <math>\therefore [M^1 L^2 T^{-2}] = [M^1 L^2 T^{-2}]</math>  OR  Equn is dimensionally correct  OR  Statement is correct/true  - give one mark</p>	$1\frac{1}{2}$	
10	(a)	II and III	2	2
	(b)	$H = \frac{u^2 \sin^2 \theta}{2g}$ $\therefore H = \frac{20^2 \times \sin^2 30}{2 \times 9.8} = 5.1 \text{ m}$	1	
			$\frac{1}{2} + \frac{1}{2}$	
11	(a)	I	1	1
	(b)	$V_0 = \sqrt{\frac{g R_E^2}{(R_E + h)}} \quad \text{OR} \quad V_0 = \sqrt{\frac{G M}{R + h}}$	1	



Qn No	Sub Qns	Answer Key/Value Points	Score	Total
15	(a)	<p>Centripetal force is <sup>provided</sup> produced by</p> $\frac{mv^2}{R} = N \sin \theta + f \cos \theta \quad \text{--- (1)}$ <p>OR</p> <p>The diagram representing <math>N \sin \theta</math> OR <math>f \cos \theta</math> <del><math>N \cos \theta</math></del></p> $mg = N \cos \theta - \mu_s N \sin \theta \quad \text{--- (2)}$ $\frac{(1)}{(2)} \Rightarrow \frac{mv^2}{R} = \frac{N \sin \theta + f \cos \theta}{N \cos \theta - \mu_s N \sin \theta}$ $f = \mu_s N$ $\therefore v = \sqrt{Rg \left[ \frac{\mu_s + \tan \theta}{1 - \mu_s \tan \theta} \right]}$ <p>OR</p> <p>final eqn only - give 2 marks</p>	1 1 1 1/2 1/2	4
	(b)	I	1	1
16	(a)	Kinetic energy	1	1
	(b)	<p><math>u=0, t=10s, F=20N, m=5kg</math></p> <p><math>F=ma</math> OR <math>a=F/m</math></p> <p><math>\therefore a = \frac{20}{5} = 4 \text{ m/s}^2</math></p> <p>OR <math>a = 4 \text{ m/s}^2</math> - give 1 mark</p> <p><math>v = u + at</math></p> <p><math>v = 0 + 4 \times 10 = 40 \text{ m/s}</math></p> <p>OR <math>v = 40 \text{ m/s}</math> only</p> <p>- give one mark.</p>	1/2 1/2 1/2 1/2	

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
		$k = \frac{1}{2} m v^2$ $\therefore k = \frac{1}{2} \times 5 \times 40^2 = 4 \times 10^3 \text{ J}$ <p style="text-align: center;">OR</p> $k = 4 \times 10^3 \text{ J only give 1 mark}$	$\frac{1}{2}$ $\frac{1}{2}$	3
	(c)	True	1	1
17A	(a)	II	1	1
	(b)	$\frac{dL}{dt} = \frac{d}{dt} (\vec{r} \times \vec{p})$ $= \vec{r} \times \frac{d\vec{p}}{dt} + \frac{d\vec{r}}{dt} \times \vec{p}$ $= \vec{c}$ <p style="text-align: center;">OR</p> $\frac{d\vec{L}}{dt} = \vec{c} \text{ - give one mark}$	2  1  1	4
17B	(a)	IV	1	1
	(b)	<p>Statement / fig with eqn  OR  fig only or eqn only give one mark.</p> $I_z = I_{xt} + I_y$ <p>substitution <math>\frac{MR^2}{2} = I_D + I_D</math></p> $\therefore I_D = \frac{MR^2}{4}$	2  1  1	4

