edexcel

October 2019
Mechanics 2 – WME02
Mark Scheme – Final

Q	Scheme	Marks	Notes
1	Moments about y-axis	M1	Or a parallel axis. Require all terms and dimensionally correct. Condone sign errors $3m\bar{x}$ or $3\bar{x}$ is a method error
	$(k+4)m\bar{x} = 2m+12m+km$	A1	Or equivalent
	Moments about x-axis	M1	Or a parallel axis. Require all terms and dimensionally correct. Condone sign errors $3m\bar{y}$ or $3\bar{y}$ is a method error
	$(k+4)m\bar{y} = m+9m+5km$	A1	Or equivalent
			Allow the first 4 marks for a combined equation in vector format
	Use of $\bar{y} = 2\bar{x}$ to form equation in k	M1	
			Allow the first 5 marks if they go straight to an equation equating the right hand sides e.g. $m+9m+5km = 2(2m+12m+km)$ with no incorrect statement about the total mass seen
	$10+5k = 2(14+k) \Rightarrow k = 6$	A1	With no errors seen
		(6)	
		[6]	
2	Use of $F = \dfrac{16000}{U}$	M1	$\dfrac{16}{U}$ scores M0
	Equation of motion.	M1	All terms required. Dimensionally correct. Condone sign errors and sin/cos confusion.
	$F - 30U - 750g\sin\theta = 0$	A1	Correct unsimplified equation in F or their F
	$\Rightarrow \dfrac{16000}{U} - 30U - 490 = 0$ $30U^2 + 490U - 16000 = 0$	DM1	Form and solve a quadratic equation in U Horizontal form seen or implied. Dependent on the two preceding M marks Need to see working if solving an incorrect quadratic or obtain an incorrect answer.
	$U = 16.3$ or $U = 16$ only	A1	Max 3 sf
		(5)	
		[5]	