Question Number	Scheme	Marks
7(a)	$1.4 = \frac{1}{2}a \times 2^2$	M1
	$a = 0.7$ (m s^{-2}) * **GIVEN ANSWER**	A1*
		(2)
7(b)	Inextensibility of string	B1
		(1)
7(c)	$3g - T = 3 \times 0.7$ (for B)	M1 A1
	Resultant = $2T\cos 45^o$ **OR** $= \sqrt{T^2 + T^2}$ **OR** $= \frac{T}{\cos 45^o}$	M1
	= 39 or 38.6 (N)	A1
		(4)
7(d)	$T - F = 4 \times 0.7$ (for A) **OR** $3g - F = 7 \times 0.7$ (whole system)	M1 A1
	$R = 4g$; $F = \mu \times R$	B1; B1
	$27.3 - \mu \times 4g = 4 \times 0.7$ **OR** $3g - \mu \times 4g = 7 \times 0.7$	**D**M1
	$\mu = 0.625$ or 0.63	A1
		(6)
7(e)	$v = 0.7 \times 2$ or $v = \sqrt{2 \times 0.7 \times 1.4}$	M1
	$-\mu \times 4g = 4a$	M1
	$0^2 = 1.4^2 - 2 \times \frac{5g}{8} s$	M1
	$s = 0.16$ or 0.159	A1
	0.16 + 1.4 < 2 => Does not reach pulley	A1 **cso**
		(5)
	ALTERNATIVE for final 3 marks:	**(18)**
	$v^2 = 1.4^2 - 2 \times \frac{5g}{8} \times 0.6$	M1
	= –5.39 or –5.4488	A1
	Since v^2 must be ≥ 0, does not reach pulley	A1 **cso**
	Notes for question 7	
7(a)	M1 Complete method to obtain an equation in a only. *Allow verification*	
	A1* Given answer correctly obtained or *verification completed correctly.*	
7(b)	B1 B0 if any extras given.	
7(c)	M1 Equation of motion for B with usual rules	
	A1 Correct equation	
	M1 for correct expression in terms of T	
	A1 39 or 38.6 (N)	
7(d)	M1 Equation of motion for A or whole system, with usual rules	
	A1 Correct equation	
	B1 $R = 4g$	
	B1 $F = \mu R$	
	DM1 Solving to give equation in μ only. Dependent on first M1	

Question Number	Scheme	Marks
	N.B. DM0 if they use $T = 3g$	
	A1 0.625 or 0.63 (5/8 is A0)	
7(e)	M1 Finding the speed or speed^2 of either particle when B hits the floor	
	M1 Equation of motion for A. Allow without the -ve sign.	
	M1 Complete method to find distance moved by A until it stops, condone sign error. **N.B.** This is an independent M mark but M0 if they have not found a new deceleration.	
	A1 Correct distance	
	A1 cso Correct conclusion correctly reached. Must see ' < 2' or use 2 in their working	
	ALTERNATIVE for final 3 marks:	
	M1 Complete method to find v^2 where v is speed with which it would hit the pulley, condone sign error. **N.B.** This is an independent M mark but M0 if they have not found a new deceleration	
	A1 Correct value for v^2	
	A1 cso	

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom