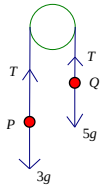
Q	Scheme	Marks	Notes
5a			**N.B**. If they use 3*m* AND 5*m* consistently, can score for (a), (b) and (c), Max M1A0 in (a) Max M1A0 DM1 A0 in (b) Max M1A0 in (c). Max B1M1A1**ft**M1A0 in (d).
	Equation of motion for *P*	M1	Require all terms. Condone sign errors
	$T-3g=3a$ oe	A1	Correct unsimplified equation
		[2]	
5b	Equation of motion for *Q*	M1	Require all terms. Condone sign errors
	$Q:5g-T=5a$ oe	A1	Second correct equation.
			Condone combined equation $5g-3g=(5+3)a$ in place of one of the above
	Solve for *T*	**D**M1	Dependent on both previous M marks, for solving for *T*. **N.B.** They could solve using a calculator, in which case this DM could be implied by a correct answer.
	$T = 36.8$	A1	Accept $\frac{15g}{4}$ oe or 37 **N.B.** Must be a numerical value.
		[4]	
5c	Force on pulley $=2T$	M1	Correct for their *T*, provided $T\neq 0$
	$F = 73.5$	A1**ft**	Accept $\frac{15g}{2}$ or 74 (not 73.6), ft on their *T* value. **N.B.** Must be a numerical value.
		[2]	
5d	Use of $a=\frac{g}{4}$ oe	B1	Must be used in (d).
	Complete method to find *v* or v^2 with $a\neq g$	M1	M0 if *s* = 8 is used
	$v^2=2\times a\times 2$ $\left(v^2=2\times\frac{g}{4}\times 2\right)$	A1**ft**	Correct unsimplified equation in *v* or v^2. ft on their $a\neq\pm g$
	Speed at ground	M1	Complete method with $a=\pm g$, *s* = 8, and a calculated v^2 at *s* = 2, condone sign errors.
	$w^2=v^2+2\times g\times 8$ $w=12.9(13)\left(\text{m s}^{-1}\right)$	A1	3 sf or 2 sf **N.B.** Only penalise overaccuracy after *g* = 9.8, ONCE for the whole question.
		[5]	
		(13)	