QUESTION NUMBER	SCHEME	MARKS
5		
5(a)	$F = 10\cos\theta - 0.2g$ **or** $F = 0.2g - 10\cos\theta$	M1 A1
	$\lvert F \rvert$ = 1.9 or 1.89 (N)	A1
		(3)
5(b)	Friction acts downwards or down.	A1
	A0 for anything else.	
		(1)
5(c)	$R = T\sin\theta$ $\left(R = \frac{12T}{13}\right)$	M1 A1
	$F = \frac{1}{4}R$	B1
	Resolve vertically For min value $T\cos\theta = 0.2g - F$ For max value $T\cos\theta = 0.2g + F$	M1 A1 A1
(i)	Min T 3.2 or 3.19 (N)	A1
(ii)	Max T 13 or 12.7 (N)	A1
	N.B. Penalise over accuracy once for the whole question and penalise the FIRST time it is seen.	
	N.B. If 2 instead of 0.2 is used throughout the WHOLE question, treat as a MR.	
		(8)
		(12)
	Notes for question 5	
(a) M1	Resolve vertically, dimensionally correct, condone sin/cos confusion and sign errors.	
A1	Correct unsimplified equation.	
A1	Correct value for Friction, must be positive	
	N.B. If they use μR as their notation for F and never separate μ and R, allow M1A1A1. If, however, they do separate them, give M1A1A0.	
(b) A1	Correct direction from **a correct, but possibly unrounded, answer to part (a).**	
(c) M1	Resolve perpendicular to the rod. Must be dimensionally correct and have correct no of terms. Condone sin/cos confusion. **N.B.** M0 if they use T = 10	
A1	Correct unsimplified equation	
B1	$F = \frac{1}{4}R$ seen or implied	
M1	Resolve parallel to the rod for either case. Must be dimensionally correct and have correct no of terms. Condone sin/cos confusion. **N.B.** M0 if they use T = 10 or if they use F from part (a).	
A1	Correct minimum case equation	
A1	Correct maximum case equation	
(i)A1	cao for min T. Allow 0.325g	
(ii)A1	cao for max T Allow 1.3g	
	N.B. If only one found and no labels, allow the A mark for the equation but must state which one it is to score the A mark for the answer. **N.B.** If both correctly found and no labels, allow all the marks. **N.B.** If both correctly found but the answers are labelled wrongly, lose the final two A marks.	