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.	