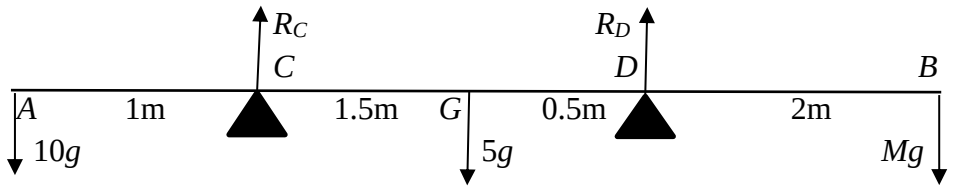
Question Number	Scheme	Marks
5.		
5(a)	M(D), $2\times R_C + 2Mg = 0.5\times 5g + 3\times 10g$	M1 A1
	$R_C = 16.25g - Mg$ oe or $R_C = 159 - 9.8M$ or $160 - 9.8M$	A1
		(3)
	Other possible equations that could be used in (a), to obtain an equation in R_C and M **only,** or in (b), to obtain an equation in R_D and M **only** ($\uparrow$), $R_C + R_D = 10g + 5g + Mg$ M(A), $R_C + 3R_D = 5g\times 2.5 + 5Mg$ M(B), $4R_C + 2R_D = 5g\times 2.5 + 5\times 10g$ M(G), $1.5R_C + 2.5Mg = 0.5R_D + 2.5\times 10g$	
5(b)	M(C), $2\times R_D + 1\times 10g = 1.5\times 5g + 4\times Mg$	M1A1
	$R_D = 2Mg - 1.25g$ oe or $R_D = 19.6M - 12.3$ or $20M - 12$	A1
		(3)
5(c)	Use of when $R_C \geq 0$ or $R_D \geq 0$ Allow equality or > 0 **N.B**. They may take moments about D or C again, with respectively $R_C = 0$ or $R_D = 0$	M1
	$M \leq 16.25$ **OR** $M \geq 0.625$ Allow equality **N.B.** Allow 2SF or better.	A1ft
	$0.625 \leq M \leq 16.25$ **N.B.** Allow 2SF or better. If either critical value appears, without working or from working done in parts (a) and/or (b), they can score M1A1ft and also potentially, the final A1.	A1
		(3)
		(9)
	Notes for question 5	
	N.B. Only penalise over accuracy, after use of g = 9.8, ONCE in this question.	
5(a)	M1 Complete method to give an equation in R_C and M **only**, correct number of terms, condone sign errors, dim correct M0 if they assume that the reactions are equal.	
	A1 Correct equation(s)	
	A1 Correct expression (g's must be collected)	
5(b)	M1 Complete method to give an equation in R_D and M **only**, correct number of terms, condone sign errors, dim correct	

	M0 if they assume that the reactions are equal.	
	A1 Correct equation(s)	
	A1 Correct expression (g's must be collected)	
5(c)	M1 Use of either of their reactions to find one critical value	
	A1ft Critical value of R_C **OR** Critical value of R_D but must be POSITIVE.	
	A1 cao Allow $0.625\text{kg} \leq M\text{kg} \leq 16.25\text{kg}$	