Question Number	Answer	Mark
5(a)	Method to form a relevant equation in T only	M1
	$s = ut + \frac{1}{2}at^2 \qquad 1000 = 35T + \frac{1}{2} \times 0.4T^2$	A1
	$(T =) 25$	A1
		(3)
5(b)	Method to find the time when $v_B = v_A + 9.5$ For example, Use of $A \qquad v = u + at \quad v_A = 35 + 0.4t_1$ and use of $B \qquad v = u + at \quad v_B = 44 + 0.5t_1$ and use of $v_B = v_A + 9.5$ to form an equation in t_1 only	M1
	Correct equation in t_1 eg • $44 + 0.5t_1 = 35 + 0.4t_1 + 9.5$ • $t_1 = \frac{35 + 9.5 - 44}{0.5 - 0.4}$	A1
	$(t_1 =) 5$	A1
	Method to find the time when $s_B = s_A + 200$ For example, Use of $A \qquad s = ut + \frac{1}{2}at^2 \quad s_A = 35t_2 + \frac{1}{2}0.4(t_2)^2$ and use of $B \qquad s = ut + \frac{1}{2}at^2 \quad s_B = 44t_2 + \frac{1}{2}0.5(t_2)^2$ and use of $s_B = s_A + 200$ to form an equation in t_2 only	M1
	Correct equation in t_2 eg • $44t_2 + \frac{1}{2} \times 0.5t_2^{\,2} = 35t_2 + \frac{1}{2} \times 0.4t_2^{\,2} + 200$ • $0.05t_2^{\,2} + 9t_2 - 200 = 0$	A1
	$(t_2 =) 20$	A1
	$(t_2 - t_1 =) 15$ (s)	A1
		(7)
		(10)
	Notes for Question 5	
5(a)		
M1	Use of relevant *suvat* equations to form an equation in T only. If more than one equation is used, the method mark is given when the equations are reduced to T only.	
A1	Correct unsimplified equation in T only	
A1	Correct answer, 25 only	
5(b)		

M1	Method to form an equation in time when $v_B = v_A + 9.5$, condone use of $v_B = v_A - 9.5$. Use of relevant *suvat* equations for *A* and *B* to form a dimensionally correct equation in t_1 only. Allow use of any letter for time. If other equations are used, may find speeds $(v_A = 37, v_B = 46.5)$ before finding an equation in t_1 only.	
A1	Correct unsimplified equation in time only	
A1	Correct answer only	
M1	Method to form an equation in time when $s_B = s_A + 200$, condone use of $s_B = s_A - 200$ for the method only. Use of relevant *suvat* equations for *A* and *B* to form a dimensionally correct equation in t_2 only. Allow use of any letter for time.	
A1	Correct equation in time only	
A1	Correct answer only	
A1	Correct answer from correct values (e.g. 20 – 5 = 15)	

6.



Figure 3

A washing line $ABCD$ holds two heavy garments, one at B and one at C.

The section AB makes an angle of 20° with the horizontal, the section BC is horizontal and the section CD makes an angle of $\alpha°$ with the horizontal, as shown in Figure 3.

The points A, B, C and D all lie in the same vertical plane.

The washing line and the two garments are in equilibrium, with all three sections of the washing line taut.

- the garment at B is modelled as a particle of mass 2 kg
- the garment at C is modelled as a particle of mass 3 kg
- the washing line is modelled as being light

(a) Find the tension in AB.

(2)

(b) Find the value of α

(6)

(c) If the washing line was **not** modelled as being light, state why it would **not** be possible to answer part (a).

(1)