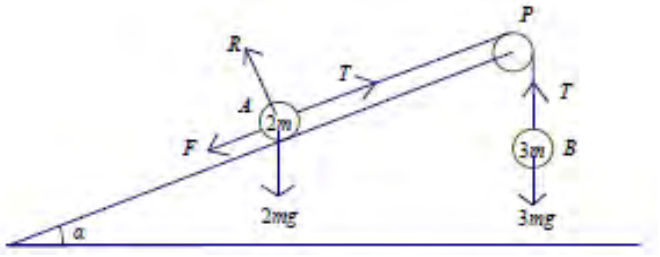
Question 3 (Total 12 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)			
	$R = 2mg\cos\alpha = \frac{24mg}{13}$	B1	This mark is given for using the model to state the normal reaction between A and the plane
	$F_{\max} = \frac{1}{3}R = \frac{8mg}{13}$	B1	This mark is given for the use of $F = \mu R$
	Equation of motion for A is $T - F_{\max} - 2mg\sin\alpha = 2ma$	M1	This mark is given for a method form an equation of motion for A
		A1	This mark is given for a correct equation of motion for A
	Equation of motion for B is $3mg - T = 3ma$	M1	This mark is given for a method to form an equation of motion for B
		A1	This mark is given for a correct equation of motion for B
	$2(3mg - T) = 3(T - \frac{8mg}{13} - \frac{10mg}{13})$ $6mg - 2T = 3T - \frac{54mg}{13}$	M1	This mark is given for a method using the equations of motion for A and B to solve for T
	$5T = \frac{132}{13}mg \Rightarrow T = \frac{132}{65}mg$	A1	This mark is given for a full method and correct working to show the answer given
(b)	$F_{\max} = \frac{8mg}{13} < \frac{10mg}{13}$ $\frac{10mg}{13}$ is the component of the weight parallel to the slope	M1	This mark is given for a comparison of $F_{\max}$ with the component of weight
	Thus A will move down the plane	A1	This mark is given for a fully justified and correct conclusion

(c)	Have the model consider air resistance Have the model use an extensible string	B2	These marks are given for two correct refinements stated (B1 for one refinement stated)