

Question Number	Answer	Mark
1(a)	<p>Static domino now has an unbalanced force acting on it so starts to move/fall <b>Or</b> falls from rest <b>Or</b> accelerates</p> <p><b>Or</b> Before it is hit, the static domino has no unbalanced force on it (so) remains at rest</p>	<p>(1) (1) (1) (1)</p> <p><b>2</b></p>
*1(b)	<p><b>(QWC – work must be clear and organised in a logical manner using technical terminology where appropriate)</b></p> <p><u>The bottom coin is knocked out from under the stack</u> Only the bottom coin is given a force <b>Or</b> bottom coin has an unbalanced force on it Bottom coin starts to move <b>Or</b> accelerates</p> <p><u>The flicked coin stops</u> Stacked/bottom coin gives the flicked coin a force <b>Or</b> force on flicked coin due to N3. The resultant force on the flicked coin is opposite to the direction of motion <b>Or</b> the flicked coin decelerates</p> <p><u>The stack drops down</u> The remaining stacked coins do not receive any horizontal force (so stay still horizontally) The stacked coins now have an unbalanced vertical force (and drop) <b>Or</b> there is now only weight acting (vertically)</p>	<p>(1) (1) (1) (1) (1) (1)</p> <p><b>6</b></p>
1(c)	<p>The idea that the direction of the (force of the flicked) coin on the stack is in a different direction (to initial direction of travel)</p> <p>The idea that the force from stack on (flicked) coin is in a different direction (to initial direction of travel) (Accept a labelled diagram indicating an off-centre collision)</p>	<p>(1) (1)</p> <p><b>2</b></p>
	<b>Total for question</b>	<b>10</b>

Question Number	Answer	Mark
2(a)(i)	Use of $W = mg$ (1) Use of $T\cos 30$ <b>Or</b> $W/\cos 30$ <b>Or</b> $T\sin 60$ <b>Or</b> $W/\sin 60$ (1) Factor of 4 seen/used (1) $T = 1.5 \times 10^{-3}$ N (1)  <u>Example of calculation</u> $\text{Weight} = 5.4 \times 10^{-4} \text{ kg} \times 9.81 \text{ N kg}^{-1} = 5.30 \times 10^{-3} \text{ N}$ Vertical component of tension = $T \cos 30^\circ$ $4T \cos 30^\circ = 5.30 \times 10^{-3} \text{ N}$ $T = 1.53 \times 10^{-3} \text{ N}$	4
2(a)(ii)	The tension has a horizontal <u>component</u> (as well) <b>Or</b> only the vertical <u>component</u> of the tension supports the weight (1)	1
2(b)	When under the twig (the stress/force is) tensile and when on top it is compressive (1)	1
<b>Total for question</b>		<b>6</b>

Question Number	Answer	Mark
*3(a)	<b>(QWC – work must be clear and organised in a logical manner using technical terminology where appropriate)</b>  <b>Max 5</b>  Solid ( $\text{CO}_2$ ) exerts a force on the gas ( $\text{CO}_2$ ) (1) N3 means (gas exerts) a force on the solid/X (1) Force is in opposite direction on the solid/gas (1)  There is a resultant/unbalanced force (on the solid) (1) N2/1 means the (solid) accelerates (accept changes velocity/speed) (1) Rapid because mass/friction is small (1)  (No mark for a statement of Newton's Laws)	5
3(b)	More than one jet (1)  Zero/no resultant force <b>Or</b> forces balanced/cancel (1)	2
<b>Total for question</b>		<b>7</b>