
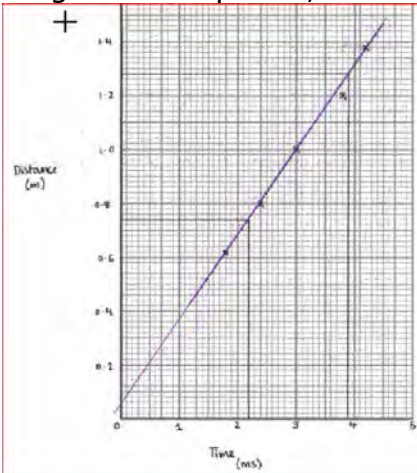


Question number	Answer	Notes	Marks												
3 (a)	B;		1												
(b) (i)	<p>MP1. Axes labelled with units; MP2. Correct scales (to occupy at least ¼ of the area of the graph and in sensible intervals); MP3. Plotting; MP4. Plotting; MP5. straight line of best fit which extends beyond given data points;</p> <div data-bbox="441 687 1184 1165"><table data-bbox="943 952 1184 1165"><thead><tr><th>Distance in m</th><th>Time in ms</th></tr></thead><tbody><tr><td>0.62</td><td>1.8</td></tr><tr><td>0.80</td><td>2.4</td></tr><tr><td>1.00</td><td>3.0</td></tr><tr><td>1.20</td><td>3.8</td></tr><tr><td>1.38</td><td>4.2</td></tr></tbody></table></div>	Distance in m	Time in ms	0.62	1.8	0.80	2.4	1.00	3.0	1.20	3.8	1.38	4.2	<ul style="list-style-type: none">ignore orientation of graphscale intervals on axes should be 2 or 5 or 10points should be less than 0.5 sq in diameter-1 each incorrect plot to max of -2tolerance = +/- ½ squareif zero is not included, then line should go through all points except 3rd or 4thif zero included, look for balance of points	5
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(ii)	<p>Attempt to find slope or gradient of line ; AND evaluation of value; matching unit; e.g. = $0.6/0.0018$ = 333 m/s</p>	<p>Δ seen or two lines from same axis seen or rise/run seen value in range of 310-350 allow 0.333 km/s 0.333 m/ms</p>	3
(iii)	<p>Any one specific variable from the experiment; e.g. hitting the block in the same place</p> <p>Use the same microphone/timer/wires</p> <p>Ensure there is no 'hammer bounce'</p>	<p>These must be specific to the experiment Accept same</p> <ul style="list-style-type: none"> • temperature • humidity • density • draughts • force • block <p>ignore</p> <ul style="list-style-type: none"> • 'keep everything the same' • use control variables • repeat experiment 	1
(iv)	<p>Any 2 suggestions from</p> <p>MP1. repeat the time readings (for each distance);</p> <p>MP2. measure the distance to the sensor of the microphone;</p> <p>MP3. use wider range of distance readings (<0.62 or >1.38);</p> <p>MP4. use intermediate distances (between points);</p>	<p>ignore imprecise suggestions e.g.</p> <ul style="list-style-type: none"> • 'be careful with timer' • 'change the distance' 	2

(Total for Question 3 = 12 marks)