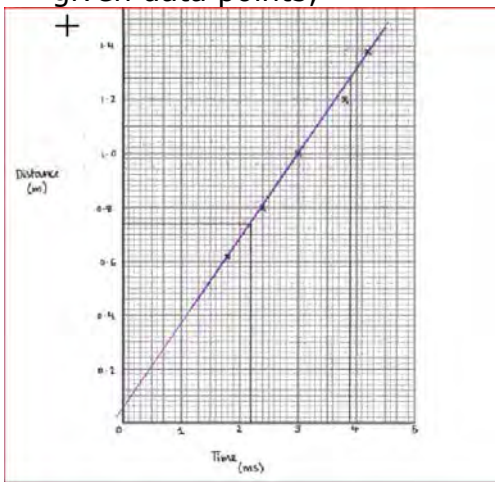
Question number	Answer	Notes	Marks
3 (a)	B;		1
(b) (i)	MP1. Axes labelled with units; MP2. Correct scales (to occupy at least ¼ of the area of the graph and in sensible intervals); MP3. Plotting; MP4. Plotting; MP5. straight line of best fit which extends beyond given data points;  Distance (m) Time (ms) **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	• ignore orientation of graph • scale intervals on axes should be 2 or 5 or 10 • points should be less than 0.5 sq in diameter • -1 each incorrect plot to max of -2 • tolerance = +/- ½ square • if zero is not included, then line should go through all points except 3rd or 4th • if zero included, look for balance of points	5

(ii)	Attempt to find slope or gradient of line ; AND evaluation of value; matching unit; e.g. = 0.6/0.0018 = 333 m/s	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	3
(iii)	Any one specific variable from the experiment; e.g. hitting the block in the same place Use the same microphone/timer/wires Ensure there is no 'hammer bounce'	These must be specific to the experiment Accept same • temperature • humidity • density • draughts • force • block ignore • 'keep everything the same' • use control variables • repeat experiment	1
(iv)	Any 2 suggestions from MP1. repeat the time readings (for each distance); MP2. measure the distance to the sensor of the microphone; MP3. use wider range of distance readings (<0.62 or >1.38); MP4. use intermediate distances (between points);	ignore imprecise suggestions e.g. • 'be careful with timer' • 'change the distance'	2

(Total for Question 3 = 12 marks)