Question number	Answer	Notes	Marks
4 (a) (i)	speed = frequency × wavelength;	allow standard symbols and rearrangements e.g. v = f × λ	1
(ii)	determination of period; conversion from ms to s; evaluation of frequency; substitution into v = f × λ; evaluation of speed; e.g. period = 4 squares period = (4 × 1 =) 4 ms frequency (= 1/4 × 10^{-3}) = 250 (Hz) speed = 1.4 × 250 speed = 350 (m/s)	 allow ECF from incorrect frequency -1 for POT error 175, 700 (m/s) = 3 marks allow 0.004 (s)	5
(b)	any five from: MP1. reference to reaction time; MP2. suggestion that light flash and sound may not be at the same time; MP3. idea that distance is too short (to give accurate value); MP4. idea that ruler is not appropriate to measure this distance; MP5. idea of mis-counting the number of ruler lengths; MP6. idea of zero error on ruler; MP7. idea of ruler not going in a straight line; MP8. idea of lack of repeats; MP9. idea that time of travel is too short to be measured by a human;	ignore descriptions of different experimental methods allow description of reaction time issues allow suggestion that trundle wheel/tape measure should be used allow ground not being level	5

(Total for Question 4 = 11 marks)