SOUND WAVES 2 MARK SCHEMES

Question 1			
Question	Answers	extra information	mark
(a)(i)	(A =) a microphone	correct order essential	1
	(B =) an oscilloscope	**or** cathode ray oscilloscope **or** CRO	1
(a)(ii)	the amplitude	accept any unambiguous indication	1
(a)(iii)	quieter / softer	do **not** accept less (which could refer to the amplitude, frequency or wavelength)	1
(b)	sound cannot travel through a vacuum / (empty) space / free space	accept there is no medium for the sound to travel through	1
	(because) there is / are nothing / no particles to vibrate	accept (because) there is / are nothing / no particles between them and the source (of the sound)	1
Total			6
Question 2			
(a)(i)	same frequency / period / pitch / wavelength	ignore references to amplitude	1
(a)(ii)	differences in waveform / shape / quality	accept the diagrams are not identical	1

(b)(i)	20 000 Hz / hertz **or** 20 kHz / kilohertz	in both cases, if the **symbol** rather than the name is used, it must be correct in every detail	1
Total			3

Question 3

(a)(i)	20 (Hz) to 20 000 (Hz) / 20 kHz	or reversed order	1
(a)(ii)	ultrasound / ultrasonic	do not accept sonic	1
(b)	examples discriminates against (young) people who are not being a nuisance discriminates against young people (just) moves the group to another meeting place discourages young people from shopping distresses babies it s morally / ethically wrong	allow any reasonable response it bothers young people is insufficient ignore reference to animals ignore damages hearing	1
(c)	(mechanical) vibration	accept vibrations in the air / particles	1
(d)(i)	the sound intensity gets (much) less the greater the distance from (the source of) the sound	allow the clos<u>er</u> you are to the machine the more likely it is to damage your hearing	1

	correct comparison from the graph eg sound is 100 (w/m †) at 1 (m) but only 20 (w/m †) at 2.5 (m)	accept the graph falls steeply (at first) and then more gently	1
(d)(ii)	any **two** from: • (so) data can be compared • anomalous results can be checked / removed / identified • more than one set of data • intensity / loudness fluctuates	increases reliability is insufficient improves accuracy is insufficient fair test is insufficient	2
Total			**8**