Question Number	Answer	Mark
2(a)(i)	• To ensure the sound waves are coherent **Or** to ensure the two waves have a constant phase relationship **Or** to ensure the two sound waves have the same frequency **and** wavelength **Or** to ensure the sound waves are produced in phase **(1)**	**1**
2(a)(ii)	• Loud sound could damage hearing/ears (accept named part of the ear e.g., ear drum) **(1)** • Wear ear defenders/plugs **Or** limit the volume of sound **Or** limit the duration/time of the exposure **Or** do not stand too close to the loudspeakers **(1)**	**2**
2(b)(i)	• Subtraction of distance between two maxima **(1)** • Calculation of average distance between maxima using a minimum of 3 gaps **(1)** • $w = 0.62$ m **(1)** Example of calculation Total distance = 3.33 – 0.22 = 3.11 m Number gaps = 5 $w = 3.11 / 5 = 0.62$ m	**3**
2(b)(ii)	• Use of $w = \lambda D / s$ **(1)** • Correct value of λ to 2 s.f. with correct unit **(1)** Allow e.c.f. from 2(b)(i) Example of calculation $\lambda = sw / D = 1.10 \text{ m} \times 0.62 \text{ m} / 4.0 \text{ m} = 0.1705 = 0.17$ m	**2**
2(b)(iii)	• The connections to one of the speakers were reversed **Or** waves emitted from the two speakers are in antiphase **(1)** • So destructive interference takes place **(1)**	**2**
2(c)(i)	• As $v = f \lambda$, so the frequency would need to be determined **(1)** • States suitable apparatus to measure the frequency (e.g. frequency meter, oscilloscope, suitable app on a mobile phone, etc.) **(1)**	**2**
2(c)(ii)	• As $\lambda = v / f$, λ will increase (for a constant f) **Or** if v increases (for a constant f,) λ will increase **(1)** • (As $w = \lambda D / s$), w will increase as D and s remain constant **(1)** **OR** • $w = v D / f s$ **(1)** • Hence as v increases, w will increase as f, D and s remain constant **(1)**	**2**
	Total for question 2	**14**