Question	Answer	Marks	AO Element	Notes	Guidance
1	(λ =) $v \div f$ **OR** 340 ÷ 20 000 **OR** 340 ÷ 20 (1) 0.017 m **AND** 17 m (1)	**2**			
2	diffraction mentioned (1) wavelength of sound from drum / low frequency sound greater (than wavelength of high frequency sound) (1) more diffraction of sound from drum **OR** less diffraction of high frequency sound (1)	**3**			
3	v = fλ in any form **OR** (f =) v / λ (1) (f =) 1.2 / 0.36 (1) (f =) 3.3 Hz (1)	**3**			
4(a)	three straight crests, to the right of A parallel to incident crests **AND** the same wavelength by eye (1) curving round correct way below A (1)	**2**			
4(b)	diffraction	**1**			

Question	Answer	Marks	AO Element	Notes	Guidance
5	sound / ultrasound (1) compressions (1)	**2**			
6	C - 8	**1**			
7(a)(i)	diffraction	**1**			
7(a)(ii)	4 arcs between dashed lines centred vertically at centre of gap any 3 wavelengths same as incident wavelengths including wavelength from wavefront in gap	**2**			
7(b)(i)	wavefronts have smaller angular width **OR** do not extend as far as dashed lines **OR** less (angular) spread	**1**			
7(b)(ii)	increased wavelength **OR** more spreading use of $v = f \lambda$ **OR** increased wavelength	**2**			

Question	Answer	Marks	AO Element	Notes	Guidance
8	$v = f\lambda$ **OR** (λ =) $v \div f$ (1) (λ =) $3 \times 10^{8} \div 1.3 \times 10^{17}$ (1) (λ =) 2.3×10^{-9} m (1)	**3**			
[Total: 23]					