Question Number	Answer		Mark
17a	(Two) waves travelling in opposite directions **Or** wave meeting its reflection	(1)	
	Nodes are points of zero/minimum amplitude **and** antinodes are points of maximum amplitude	(1)	
	Nodes linked to destructive interference **and** antinodes linked to constructive interference	(1)	**3**
17b	Equates $v = f\lambda$ and $v = \sqrt{(T/\mu)}$	(1)	
	Rearranges to give $f^2 = \frac{T}{\mu\lambda^2}$ **Or** $f^2 = \frac{T}{\mu(2L)^2}$	(1)	
	Replaces T with W in equation	(1)	
	Where μ and λ are constants **Or** where μ and L are constants	(1)	
	f^2 α W **Or** no "c" in "$y=mx+c$" **Or** y-intercept is 0 **Or** in the format $y = mx$	(1)	**5**
	(MP5 is dependent on some correct working leading to an equation) (Award MP4 if stated that $\frac{1}{\mu\lambda^2}$ = constant or equivalent in terms of l)		
17c	(Connect signal generator to) cathode ray oscilloscope **Or** record movement of the string with a video camera	(1)	
	(Measure time period T and) calculate $f = 1/T$	(1)	**2**
17d	Use of $v = \sqrt{(T/\mu)}$	(1)	
	Identifies that $\lambda = 2L$	(1)	
	$\mu = 4.3 \times 10^{-4}$ kg m^{-1}	(1)	**3**
	<u>Example of calculation</u> $f\lambda = \sqrt{(T/\mu)}$, 659 Hz × (2 × 0.328 m) = $\sqrt{(80.0 \text{ N} / \mu)}$, $\mu = 4.3 \times 10^{-4}$ kg m^{-1}		
	Total for question 17		**13**