Question Number	Answer		Mark
15(a)	Conversion of beats minute^{-1} to Hz [Accept calculation of T]	**(1)**	**4**
	Use of $\omega = 2\pi f$	**(1)**	
	Use of $v = -A\omega \sin \omega t$ with $\sin \omega t = 1$	**(1)**	
	A = 1.5 (mm) [Allow max displacement = 2A]	**(1)**	
	Example of calculation $f = \frac{142}{60\ \text{s}} = 2.37\ \text{Hz}$ $\omega = 2\pi \times 2.37\ \text{s}^{-1} = 14.9\ \text{rad s}^{-1}$ $A = \frac{22.0 \times 10^{-3}\ \text{m s}^{-1}}{14.9\ \text{s}^{-1}} = 1.48 \times 10^{-3}\ \text{m} = 1.48\ \text{mm}$		
15(b)	For an object to move with simple harmonic motion there must be an acceleration/(resultant) force that is proportional to the displacement from the equilibrium position	**(1)**	**2**
	and (always) acting towards the equilibrium position	**(1)**	
	(For equilibrium position accept: undisplaced point/position or fixed point/position or central point/position) [MP2 Accept acceleration/force is in the opposite direction to the displacement] [An attempt to use the equation can only score if all terms are defined and the minus sign explained]		
	Total for question 15		**6**