

Question Number	Answer	Mark
17(a)	<p>Either</p> <p>Current carrying coil/conductor in a magnetic field (1)</p> <p>Coil experiences a force (1)</p> <p>Force changes direction with current (as current is changing direction) (1)</p> <p>Or</p> <p>Current in coil causes a magnetic field (1)</p> <p>Field interacts with permanent magnet's field, so force on coil (1)</p> <p>Field changes direction with current so force changes direction (1)</p>	3
17(b)(i)	<p>Use of $\omega = 2\pi f$ (1)</p> <p>Use of $v = -A\omega \sin \omega t$ (1)</p> <p>(1)</p> <p>$v = 0.82 \text{ m s}^{-1}$</p> <p><u>Example of calculation</u></p> <p>$\omega = 2\pi \text{ rad} \times 75 \text{ s}^{-1} = 471 \text{ rad s}^{-1}$</p> <p>$v = 1.75 \times 10^{-3} \text{ m} \times 471 \text{ s}^{-1} \times 1 = 0.8247 \text{ m s}^{-1}$</p>	3
17(b)(ii)	At the equilibrium/undisplaced/central/middle (position) (1)	1
17(c)	<p>MAX 2</p> <p>The driver frequency of the coil matches the natural frequency of the cone (1)</p> <p>There is a maximum transfer of energy (from the coil to the cone) (1)</p> <p>Resonance occurs (1)</p> <p>[For full marks the response must be related to the question context]</p>	2
	Total for question 17	9