Question Number	Answer	Mark
17(a)(i)	• $E_{el} = ½\ k\ \Delta x^2$ (1) **Or** Use of $E_{el} = ½\ F\Delta x$ **and** use of $F = k\ \Delta x$. • Elastic PE is transferred into kinetic energy (1) **Or** $E_{el} = E_k$ • $½\ m\ v^2 = ½\ k\ \Delta x^2$ (1) • States that m and k are constant so $v \propto \Delta x$. (1) **Or** States that $= \sqrt{\frac{k}{m}}\Delta x$.	**(4)**
17(a)(ii)	• Gradient calculated. (1) **Or** Use of a point on the line in a relevant equation. • Use of $½\ k\ \Delta x^2 = ½\ m\ v^2$ **or** gradient = $\sqrt{(k/m)}$ (1) i.e. $k = m \times \text{gradient}^2$ • k in range 22 – 26 N m^{-1} (1) <u>Example of calculation</u> Gradient $\frac{4.8\ \text{m s}^{-1} - 2.2\ \text{m s}^{-1}}{0.30\ \text{m}} = 8.67\ (\text{s}^{-1})$ $k = \text{mass} \times \text{gradient}^2$ $k = 3.0 \times 10^{-1}\ \text{kg} \times (8.67\ \text{s}^{-1})^2$ $k = 22.6\ \text{N m}^{-1}$	**(3)**
17(b)	• Limit of proportionality exceeded. (1) **Or** Extension no longer proportional to force. • Range of Hooke's Law exceeded. (1) **Or** Hooke's Law no longer applies.	**(2)**
	Total for question 17	**9**