| Question Number | Scheme | Marks |
|---|---|---|
| **2(a)** | $\cos\theta = \frac{4}{5}$ | B1 |
| | $2T\cos\theta = 12$ | M1A1 |
| | $2T\left(\frac{4}{5}\right) = 12 \Rightarrow T = \frac{60}{8} = 7.5\,(\text{N})$ | A1 |
| | | (4) |
| **(b)** | $\text{Ext} = 2(2.5) - 3 = 2\,\text{m}$ | |
| | $7.5 = \frac{\lambda \times 2}{3} \Rightarrow \lambda = 11.25\,(\text{N})$ * | M1A1* |
| | | (2) |
| **(c)** | $\text{EPE} = \frac{11.25 \times 2^2}{2 \times 3} = 7.5\,(\text{J})$ | M1A1 |
| | | (2) |
| | | [8] |

**(a)**

**B1** $\cos\theta = \frac{4}{5}$ seen or implied.

**M1** Resolving vertically, with 2 equal tensions (implied) and weight.

**A1** Correct equation.

**A1** $T = \frac{15}{2} = 7.5\ \text{N}$ accept any equivalent fraction, since *g* not used.

**(b)**

**M1** Use of Hooke's Law with their tension to form equation in $\lambda$. Must be using natural length of 3 (or 1.5 for half string), but condone incorrect extension for M mark.

**A1*** 11.25 or any equivalent fraction.

**(c)**

**M1** Attempt at EPE in equilibrium position. Must have same extension as (b). Condone missing half in EPE formula. If using half strings, then they must include the EPE of both strings. Must be using natural length of 3 (or 1.5 for half string). Allow if an embedded term in an energy equation.

**A1** 7.5 J. Accept any equivalent. Must be a clear answer (not embedded).