| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **1(a)** | *T* – 0.5*g* – 1.5*g* = 2 × 0.5 | M1 A1 |
| *T* = 20.6 (N) or 21 (N) | A1 |
|  |  | **(3)** |
| **1(b)** | *R* – 1.5*g* = 1.5 × 0.5 | M1 A1 |
| Force = 15.5 (N) or 15 (N) | A1 |
| OR |  |
| *T* – *R* – 0.5*g* = 0.5 × 0.5 | M1 A1 |
| Force = 15.5 (N) or 15 (N) | A1 |
|  |  | **(3)** |
|  |  | **(6 marks)** |
| **2(a)** | For system, | M1 A1 |
|  | A1 |
|  |  | **(3)** |
| **2(b)** | For woman, | M1 A1 |
|  | A1 |
|  |  | **(3)** |
|  |  | **(6 marks)** |
| **3(a)** | 3200 N  *T*  *T*  750 kg  1000 kg  800 N  *R* N |  |
| For the whole system |  |
|  | M1 A1 |
| Leading to  🞸 | A1 |
|  |  | **(3)** |
| **3(b)** | For the caravan |  |
|  | M1 A1 |
| Leading to | A1 |
|  |  | **(3)** |
|  |  | **(6 marks)** |
| **4** |  | M1 A1  M1 A1  M1 A1 |
|  |  | **(6 marks)** |
| **5(a)** |  | M1A1 |
|  | M1A1 |
| Condone the use of  in place of one of these equations. | M1A1 |
| Reach **given answer**  correctly \*\*\* | A1 |
| Form an equation in *T*:  ,, or | M1 |
| or equivalent, 33.6*m*, 34*m* | A1 |
|  |  | **(7)** |
| **5(b)** | ,  ms-1 | M1A1 |
|  |  | **(2)** |
| **5(c)** |  | M1A1  A1  A1 |
|  |  | **(4)** |
| **5(d)** |  | M1 |
| (m) | A1 |
| Total height = (m) | A1 **ft** |
|  |  | **(3)** |
|  |  | **(16 marks)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
| 1 | M1 2016 | 2 |  | Dynamics of a particle moving in a straight line or plane | 1.1b, 3.1b, 3.3, 3.4 |
| 2 | M1 2013 | 2 |  | Dynamics of a particle moving in a straight line or plane | 1.1b, 3.1b |
| 3 | M1 Jan 2012 | 2 |  | Dynamics of a particle moving in a straight line or plane | 1.1b, 2.2a, 3.1b, 3.4 |
| 4 | M1 2017 | 5 |  | Dynamics of a particle moving in a straight line or plane | 1.1b, 3.4 |
| 5 | M1 2014 | 7 |  | Dynamics of a particle moving in a straight line or plane | 1.1b, 2.1, 2.2a, 3.1b, 3.4 |