| Question Number | Scheme | Marks |
|---|---|---|
| **6(a)** | $2000 - 500 - 500g\sin\alpha = 500a$ (truck) | M1 A2 |
| | $a = 0.256$ or $0.26$ (m s$^{-2}$) (32/125 is A0) | A1 |
| | | (4) |
| **(b)** | $D - 1200 - 500 - 1500g\sin\alpha - 500g\sin\alpha = 2000a$ (system) | M1 A2 |
| | **OR**: $D - 1200 - 1500g\sin\alpha - 2000 = 1500a$ (engine) | |
| | $D = 7700$ | A1 |
| | | |
| | **N.B**. They may write down the system and engine equations and then: (a) solve them for $a$ (b) solve them for $D$. | |
| | | (4) |
| | | **(8)** |
| | **Notes for Question 6** | |
| **6(a)** | M1 Using equation(s) of motion to give an equation in $a$ only, with correct number of terms and 500g resolved, condone sign errors | |
| | A1 Equation with at most one error | |
| | A1 Correct equation | |
| | A1 Correct answer | |
| **6(b)** | M1 Using an equation of motion to give an equation in $D$ and $a$ only, with correct number of terms and 500$g$ (or 1500$g$) resolved, condone sign errors | |
| | A1 Equation with at most one error ($a$ does not need to be substituted) Treat omission of $g$ as one error | |
| | A1 Correct equation | |
| | A1 Correct answer | |