| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **1 (a) (i)** | 8 – 0 (m/s) | 8 | **(1)** |

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **1(a)(ii)** | substitution<br>8 / 5 (1)<br><br>evaluation (1)<br>1.6 ($m/s^2$) | ecf from (i)<br><br>full marks for correct answer (or ecf) with no working shown. | **(2)** |

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **1(a)(iii)** | 0 | Nil / nothing / zero / none<br>(no mark for no response) | **(1)** |

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **1(b)** | substitution<br>F = 1200 x 0.8 (1)<br><br>evaluation (1)<br>960 (N) | full marks for correct answer with no working shown. | **(2)** |

| Question Number | | Indicative Content | Mark |
|---|---|---|---|
| **QWC** | * ) | an explanation linking some of the following points:<br><br>compared to a car with just the driver, a fully loaded car will<br><br>• have a greater mass / be heavier<br>• greater kinetic energy / momentum<br>• experience the same braking force (when brakes are applied)<br>• require a greater braking force (than available) to stop (in the same distance)<br>• have a smaller acceleration / deceleration<br>• take a longer time to come to rest (from given speed)<br>• travel greater distance in this time<br>• needs to do more work with same amount of force<br>• use of relevant equations such as F = ma, work done = F x d<br>• consequence of driver distractions | **(6)** |
| **Level** | **0** | No rewardable content | |
| **1** | **1 - 2** | • a limited explanation using one idea from the indicative content eg fully loaded car is heavier.<br>• in answer communicates ideas using simple language and uses limited scientific terminology<br>• spelling, punctuation and grammar are used with limited accuracy | |
| **2** | **3 - 4** | • a simple explanation which links ideas from the indicative content eg it is heavier and so it takes a longer distance to stop<br>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately<br>• spelling, punctuation and grammar are used with some accuracy | |
| **3** | **5 - 6** | • a detailed explanation which links several ideas from the indicative content e.g. It has more momentum and so it will take a longer time to stop. This means that it will travel a further distance. The answer communicates ideas clearly and coherently uses a range of scientific terminology accurately<br>• spelling, punctuation and grammar are used with few errors | |

| Question number | Answer | Additional guidance | Mark |
|---|---|---|---|
| **2(a)** | Rearrangement (1)<br>$m = \frac{f}{a}$<br><br>Substitution and conversion (1)<br>$m = \frac{1870}{1.83}$<br><br>Answer and rounding to 3 s.f. (1)<br>1020 (kg) | maximum 2 marks if kN not converted to N<br><br>award full marks for correct numerical answer without working | **(3)** |

| Question number | Answer | Additional guidance | Mark |
|---|---|---|---|
| **2(b)** | Rearrangement of $\frac{(v-u)}{t} = a$ (1)<br>$v = u + at$<br><br>Substitution (1)<br>$v = 0 + 1.83 \times 16$<br><br>Answer (1)<br>29.3 (m/s) | award full marks for correct numerical answer without working | **(3)** |

| Question number | Answer | Mark |
|---|---|---|
| **2(c)** | Correctly identifies data points from the graph to calculate areas (1)<br><br>Calculates area under AB (1)<br>240 m<br><br>Calculates area under CD (1)<br>135 m<br><br>distance travelled at constant speed = 240 m is greater than distance travelled when slowing down = 135 m (1) | **(4)** |