# MOMENTUM AND SUVAT ANSWERS OCR ALEVEL YEAR1

## 1.

| Question | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|
| (a) | | $W = mg$<br>weight $= 1.50 \times 9.81 = 14.72$ (N) or 14. 7 (N) or 15 (N) | B1 | **Allow**: Use of 9.8 (m s$^{-2}$)<br>**Allow**: Bald 15 (N); but **not** '1.50 × 10 = 15(N)' |
| (b) | (i) | Net / resultant force (on **B**) is less / (net) force (on **B**) is less than its weight / there is tension (in the string) / there is a vertical / upward / opposing force (on **B**) | B1 | **Note**: Must have reference to force |
| | (ii) | $s = ut + \frac{1}{2}at^2$ and $u = 0$<br>$1.40 = \frac{1}{2} \times 1.09 \times t^2$<br>$t$ = 1.60 (s) | C1<br>C1<br>A1 | <br>**Allow**: 2 marks for 1.75/1.09' if answer from **(iii)** is used<br>**Allow**: 2 sf answer<br>**Allow**: 2 marks if **2.80 m** is used; time = 2.27 (s) |
| | (iii) | $v^2 = 2 \times 1.09 \times 1.40$ / $v = 0 + 1.09 \times 1.60$<br>$v$ = 1.75 (m s$^{-1}$) / $v$ = 1.74 ( m s$^{-1}$) | C1<br>A1 | Possible ecf<br>**Allow**: 1.7 or 1.8 (m s$^{-1}$) |
| | (iv) | change in velocity = 2.47 + 1.50 (= 3.97 m s$^{-1}$)<br>acceleration = $\frac{3.97}{0.030}$<br>acceleration = 132 (m s$^{-2}$) | C1<br>A1 | Ignore sign for change in velocity<br>**Allow**: 130 (m s$^{-2}$)<br>---<br>**Special case:**<br>acceleration = $\frac{2.47 - 1.50}{0.030} = 32.3$ or 32 (m s$^{-2}$) scores 1 mark |
| | | **Total** | **9** | |

## 2.

| f | | | **Must use ticks on Scoris to show where the marks are awarded** |
|---|---|---|---|
| | Large deceleration / rapid decrease in speed (triggers the air bag) | B1 | **Not** 'quick / sudden / rapid deceleration'<br>**Not** 'large acceleration' |
| | Prevent collision with steering wheel / windscreen / dashboard | B1 | |
| | Time (for stopping) is more / distance (for stopping) is more | B1 | |
| | Smaller deceleration / acceleration (of person) | B1 | **Allow**: 'smaller rate of change of momentum'<br>**Not** 'smaller rate of deceleration' |
| | **Total** | **15** | |