| Question number | Answer | Notes | Marks |
|---|---|---|---|
| 11 (a) (i) | gravitational potential energy = mass x gravitational field strength x height; | ALLOW standard symbols (m x g x h)<br>DO NOT ALLOW 'gravity' for g | 1 |
| (ii) | substitution into correct equation; | | 1 |
| | calculation;<br>e.g.<br>g.p.e. = 2000 x 10 x 128<br>2.56 (MJ) | answer given to at least 3 sf<br><br><br>Allow J if correct (2560 000) | 1 |
| (b) (i) | 2.56 (MJ); | Value from (a) (ii) / 2.6 MJ | 1 |
| (ii) | They are <u>equal</u> / k.e. = work done; | | 1 |
| (iii) | work done = force x distance; | ALLOW standard symbols | 1 |
| (iv) | Substitution into correctly rearranged equation; | Allow ecf for value of energy stated in (a) (ii) or (b) (i) | 1 |
| | Calculation;<br>e.g.<br>d = W / F = 2 560 000 / 32 000<br>80 (m) | | 1 |

| Question Number | Answer | Notes | Marks |
|---|---|---|---|
| 11 (c) | Any TWO from<br><br>(Windy) –<br>(extra) drag / air resistance / friction;<br>more energy wasted (overcoming friction);<br><br>(Wet) –<br>less friction / no friction / slippier / less traction / less grip;<br>less energy transferred to car (at launch); | ANSWERS SHOULD REFER TO THE SITUATIONS GIVEN | 2 |
| | | **Total** | **10** |