| Question number | | | Answer | Notes | Marks |
|---|---|---|---|---|---|
| 8 | (a) | (i) | gravitational potential energy = mass x g  x height | Allow symbols and rearrangements, e.g. GPE = m x g x h | 1 |
| | | (ii) | Substitution into correct equation; Calculation; e.g. GPE = 2.75 x 10 x 0.61 =  17 (J) | 16.8, 16.775, 16.78 (J) allow calculation with g = 9.81 =16.46 (J) | 2 |
| | | (iii) | Any two of- MP1. idea that system is inefficient OR not 100% efficient; MP2. idea that energy is lost / wasted / dissipated ; MP3. explanation /detail of  fate of energy; e.g. used when working against {friction / drag / air resistance} as thermal energy to parts of the apparatus or surroundings transferred to surroundings by sound converted into KE as mass fell | condone used  / transferred elsewhere Need mention of 'object' Ignore light  allow to overcome friction allow heat for thermal energy | 2 |
| | | (iv) | Substitution into correct equation;  Calculation; e.g. Energy transferred = 0.46 x 12.7 x 1.3 7.6    (J) | allow answer without working or equation seen (7.5946) | 2 |
| | (b) | | three of the following ideas- MP1. water has (initial) GPE; MP2. KE of (moving) water; MP3. Work done on turbine / generator; MP4. Work done against magnetic force; MP5. Electrical energy/power/current/voltage (produced); | allow KE in turbine / generator | 3 |

**Total 10 marks**