

Question number	Answer	Notes	Marks
8 (a) (i)	gravitational potential energy = mass x g x height	Allow symbols and rearrangements, e.g. GPE = $m \times g \times h$	1
(ii)	Substitution into correct equation; Calculation; e.g. $GPE = 2.75 \times 10 \times 0.61$ $= 17 \text{ (J)}$	16.8, 16.775, 16.78 (J) allow calculation with $g = 9.81$ $= 16.46 \text{ (J)}$	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 = $0.46 \times 12.7 \times 1.3$ $7.6 \text{ (J)}$	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