**Mark schemes**

Q1.

(a) any two from:

• bungee rope may snap

• rope may extend too much

• student may land in the river

2

(b) gravitational potential

correct order only

1

kinetic

1

elastic potential

1

(c) ½ × 40 × 352

1

24 500 (J)

accept 25 000 (J) (2 significant figures)

1

allow 24 500 (J) with no working shown for 2 marks

[7]

Q2.

(a) (i) kinetic (energy)

allow gravitational potential (energy) / gpe

movement is insufficient

1

(ii) dissipates into the surroundings

allow warms up the surroundings / air / motor

accept lost to the surroundings

accept lost as heat

ignore reference to sound

it is lost is insufficient

1

(b) energy (required) increases with load

accept positive correlation

do not accept (directly) proportional

1

further amplification eg increases slowly at first (or up to 4 / 5 N),

then increases rapidly

simply quoting figures is insufficient

an answer that only describes the shape

of the line gains no marks

1

(c) (i) E = P × t

2880

accept £28.80 for all 3 marks

an answer £2880 gains 2 marks

allow 1 mark for obtaining 48 h or converting to kW

allow 2 marks for correct substitution

ie 4 × 48 × 15

note: this substitution may be shown as two steps

an answer 2 880 000 gains 2 marks

an answer £4.80 / 480 gains 2 marks

an answer of 192 (ie calculation of energy without subsequent calculation of cost) gains 1 mark)

3

(ii) any sensible suggestion eg

conserves fossil fuels

less (fossil) fuels burned

less pollutant gas (produced)

accept a named pollutant gas

less greenhouse gas (produced)

saves energy is insufficient

1

[8]