Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

(a) a renewable biofuel

1

(b) any two from

- burning wood causes air pollution
  allow creates smoke
- burning wood may lead to deforestation
  ignore cutting down trees
- destruction of habitats
- burning wood is carbon-neutral
  allow does not contribute to global warming or the greenhouse effect or climate change

2

(c) the chemical store of energy of the wood decreases
both the store of energy and what happens to the store are required

1

the internal/thermal store of energy of the pipe increases

1

the internal/thermal store of energy of the water increases

1

(d) energy is dissipated (to the surroundings)
allow energy is transferred/lost to the surroundings

1

at the same rate that energy is transferred to the water

1

[8]

Q2.

(a) the kinetic energy (and the potential energy) of the particles increases
allow the speed of the particles increases

1

so the internal energy increases because it is the sum of kinetic and potential energy (of

Downloaded from www.merit-minds.com

the particles)

1

(b) latent heat (of vaporisation)

allow specific latent heat (of vaporisation)

1

(c) stays the same

1

(d) more collisions per second

1

a greater force per collision

1

(e) $0.875 = \frac{\text{useful output energy transfer}}{1\,560\,000}$

allow a correct substitution using incorrectly/not converted values of efficiency and/or energy

1

useful output energy transfer = 1 365 000(J)

this answer only

the equation

$$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$$

must have been used to score subsequent marks

1

1 365 000 = 125 × c × (22.1–11.6)

allow a correct substitution using their calculated value of useful output energy

1

$$c = \frac{1\,365\,000}{125 \times 10.5}$$

allow a correct re-arrangement using their value of useful output energy

1

c = 1040 (J/kg °C)

allow a correct calculation using with their value of useful output energy

1

$c = 1.04 \times 10^3$ (J/kg °C)

this mark can only be awarded for a calculation using the correct equations

1

(f) the advertisement has ignored the energy input from the surrounding air

1

so the total energy input is greater than the energy supplied from the electricity

an answer that the total energy input comes from the electricity supply and the air outside the building gains the first two marking points

1

Downloaded from www.merit-minds.com

the efficiency must be less than 100%

1

[15]

Downloaded from www.merit-minds.com