

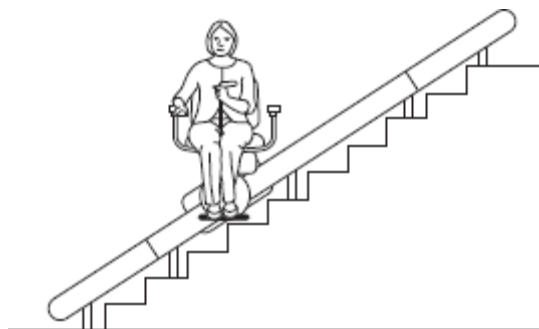
Name of the Student: _____

Max. Marks : 19 Marks

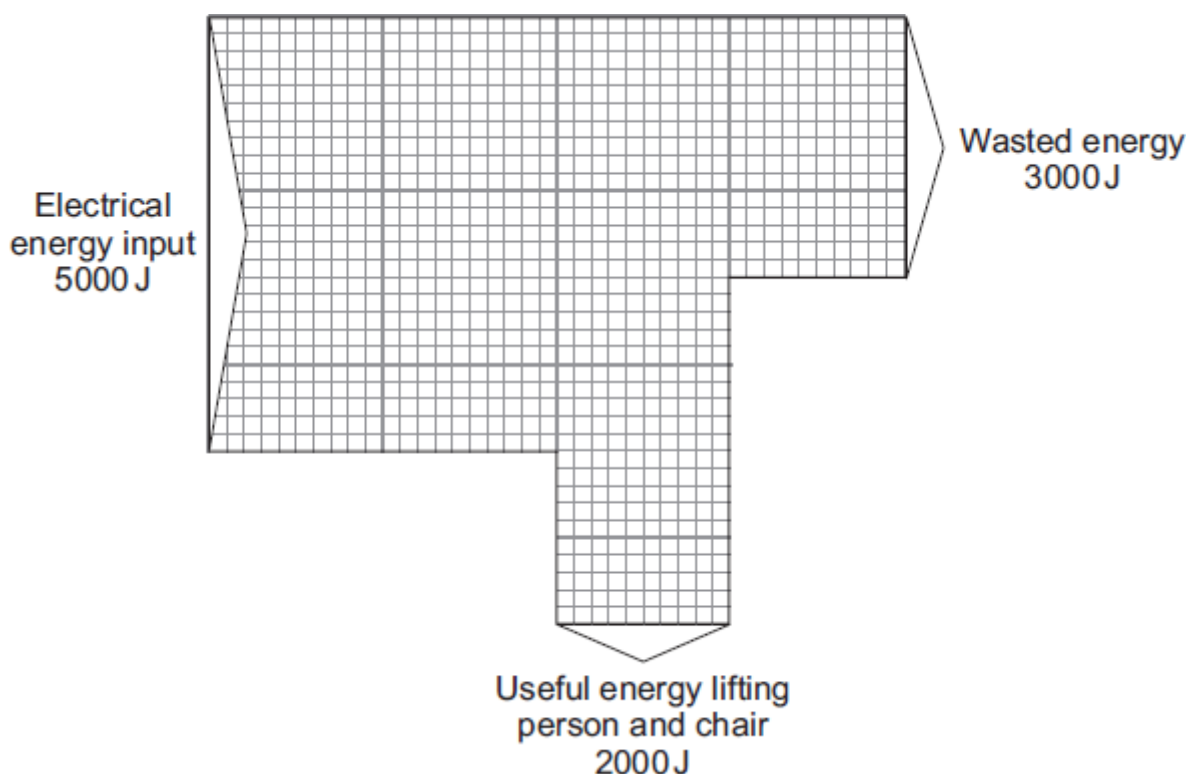
Time :19 Minutes

Q1.

A person uses a stairlift to go upstairs. The stairlift is powered by an electric motor.



The Sankey diagram shows the energy transfers for the electric motor.



(a) Complete the following sentence.

The electric motor wastes energy as _____ energy.

(1)

(b) Use the equation in the box to calculate the efficiency of the electric motor.

$$\text{efficiency} = \frac{\text{useful energy transferred by the device}}{\text{total energy supplied to the device}}$$

Show clearly how you work out your answer.

Efficiency = _____

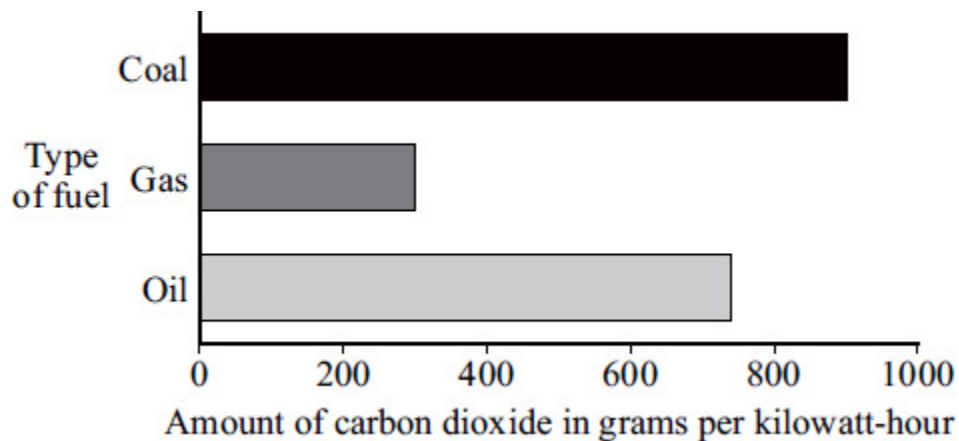
(2)

(Total 3 marks)

Q2.

- (a) Most electricity in the UK is generated in power stations that burn fossil fuels.

The bar chart shows how much carbon dioxide is produced for each kilowatt-hour of electricity generated using a fossil fuel.



- (i) Which fossil fuel produces the smallest amount of carbon dioxide for each kilowatt-hour of electricity generated?

(1)

- (ii) Which **one** of the following statements gives the reason why the data has been shown as a bar chart and not as a line graph?

Put a tick (✓) in the box next to your answer.

Both variables are categoric.

☐

Both variables are continuous.

☐

One variable is categoric, the other is continuous.

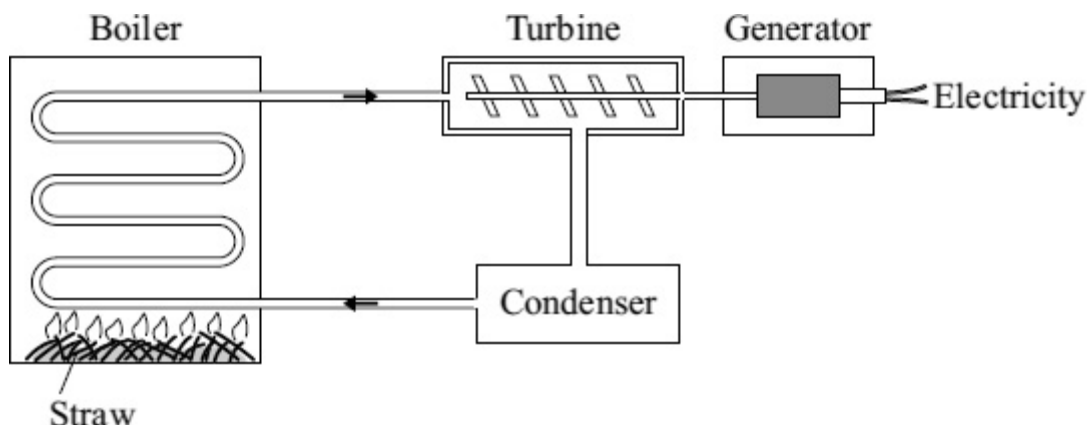
☐

(1)

- (iii) Why does a nuclear power station **not** produce any carbon dioxide?

(1)

- (b) Some types of power station generate electricity by burning straw.



- (i) Use words from the box to complete the following sentences.

boiler	gas	generator	steam	turbine	water
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Straw is burned in a _____ Water is heated to make
_____ which is used to drive a _____
This turns a _____ to produce electricity.

(4)

- (ii) Straw is a type of renewable energy source known as a biofuel.

Name **one** other type of renewable energy source used to produce electricity.

(1)

- (iii) A power station generates 36 000 000 watts (36 MW) of electrical power by burning straw. The average power used in each home in the UK over one year is 2000 watts.

Calculate the number of homes that the power station could supply electricity to.

Show clearly how you work out your answer.

Number of homes = _____

(2)

(Total 10 marks)

Q3.

Four students are talking about the different energy sources used to generate electricity in the areas where they live.

- (a) Draw **one** line from where each student lives (**List A**) to the energy source in their area (**List B**).

Draw only **four** lines.

List A Where each student lives	List B Energy source
Where I live is the sunniest part of the country.	Wind
Where I live, the land is very flat and it always seems to be windy.	Waves
Where I live, it is not safe to swim. The sea is always too rough.	Solar
Where I live, you can see steam coming out of the ground.	Tides
	Geothermal

(4)

- (b) All of the energy sources given in part (a) can be used to generate electricity.

What else do all these energy sources have in common?

(1)

- (c) In a hydroelectric power station, the energy from falling water is used to generate electricity.

Which **one** of the following gives a **disadvantage** of a hydroelectric power station?

Put a tick (✓) in the box next to your answer.

has a fast start-up time

☐

large areas of land are flooded

☐

polluting gases are produced



(1)

(Total 6 marks)