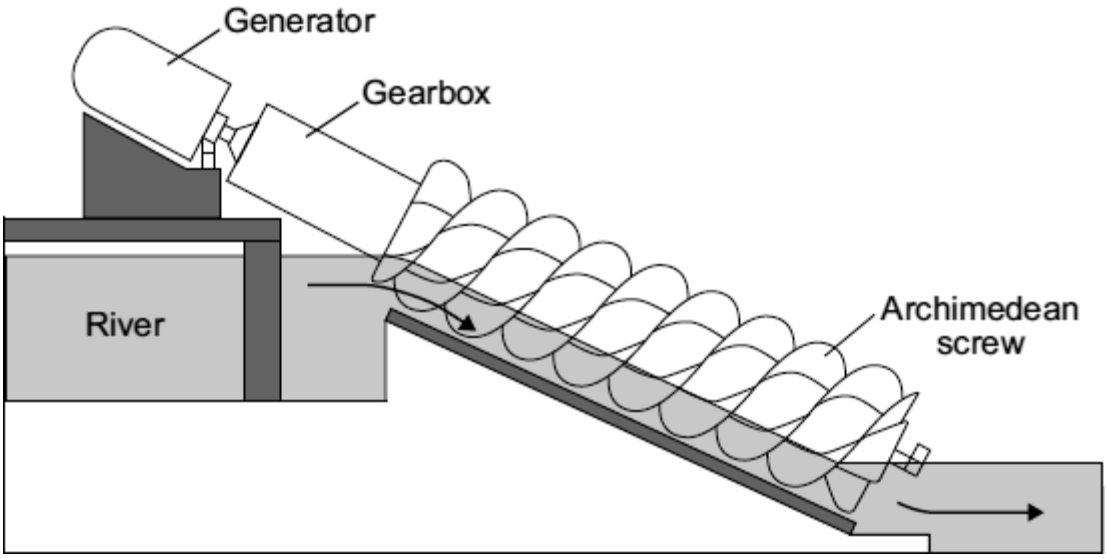
Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (Low Demand)

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The diagram shows a small-scale, *micro-hydroelectricity* generator which uses the energy of falling river water to generate electricity. The water causes a device, called an Archimedean screw, to rotate.
The Archimedean screw is linked to the generator by a gearbox.



(a) Complete the following sentence by drawing a ring around the correct word in the box.

The gravitational potential energy of the falling water is transformed

into the | chemical / electrical / kinetic | energy of the Archimedean screw.

(1)

(b) A micro-hydroelectric system generates about 60 kW of electricity, enough for 50 homes. A conventional large-scale hydroelectric power station may generate more than 5 000 000 kW of electricity.

(i) Give **one** advantage of a conventional large-scale hydroelectric power station compared to a micro-hydroelectric system.

_____

_____

(1)

Downloaded from www.merit-minds.com

(ii) Which **one** of the following statements gives a **disadvantage** of a conventional large-scale hydroelectric power station compared to a micro–hydroelectric system?

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

Energy is wasted as heat and sound. ☐

Large areas of land are flooded. ☐

A constant flow of water is needed. ☐

(1)

(c) The electricity generated by the micro-hydroelectric system is transferred directly to local homes. The electricity generated by a conventional large-scale hydroelectric power station is transferred to homes anywhere in the country through a system of cables and transformers.

(i) What name is given to the system of cables and transformers used to transfer electricity to homes anywhere in the country?

_____

(1)

(ii) Using short cables to transfer electricity to local homes is much more efficient than using very long cables to transfer electricity to homes anywhere in the country.

Why?

_____

_____

(1)

(d) Nepal is a mountainous country with over 6000 rivers. In Nepal, 9000 kW of electricity are generated using micro-hydroelectric generators.

Suggest **one** reason why in the UK much less electricity is generated using micro-hydroelectric generators, than in Nepal.

_____

_____

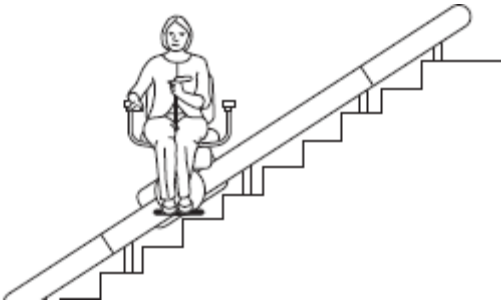
(1)

(Total 6 marks)

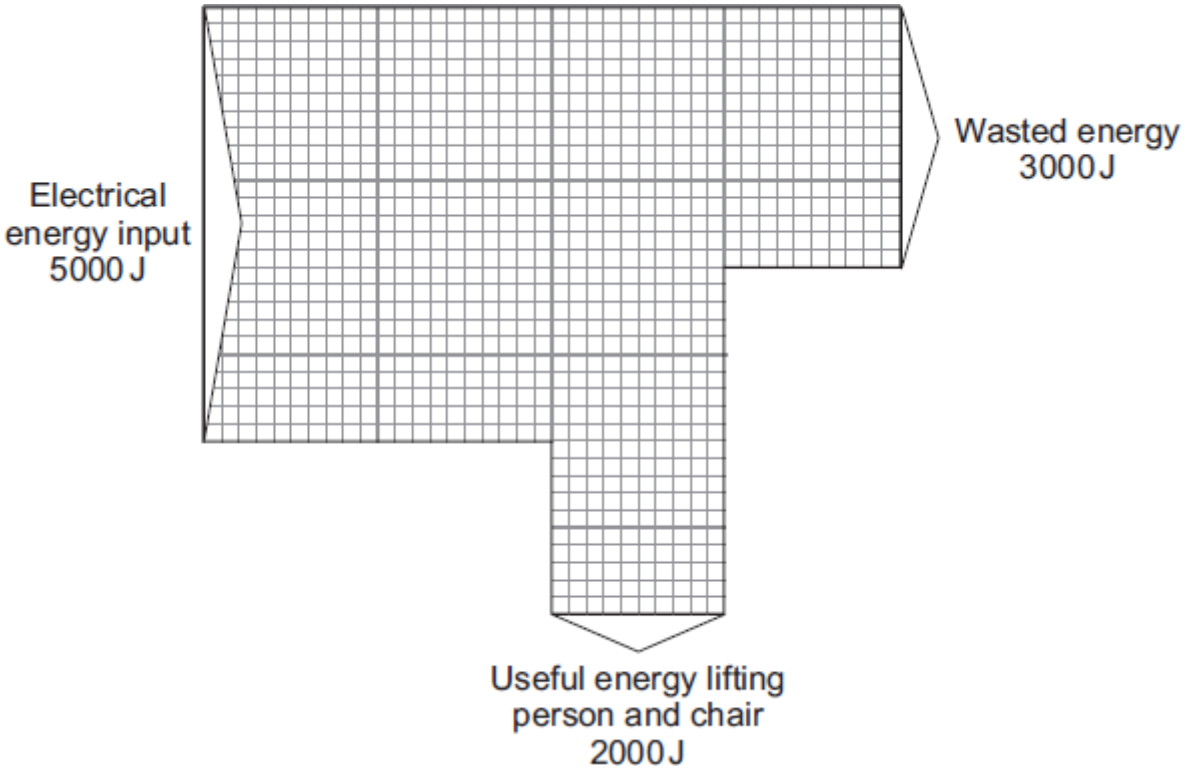
Q2.

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

Downloaded from www.merit-minds.com



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)

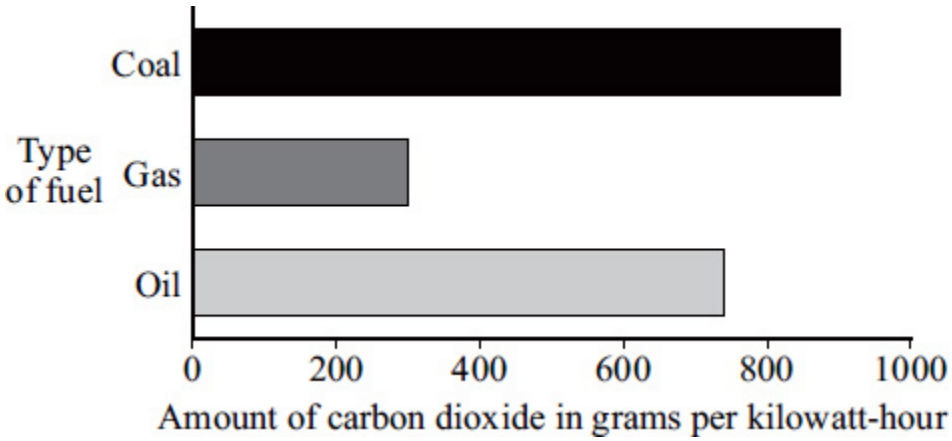
(Total 3 marks)

Downloaded from www.merit-minds.com

Q3.

(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 kilowat-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?

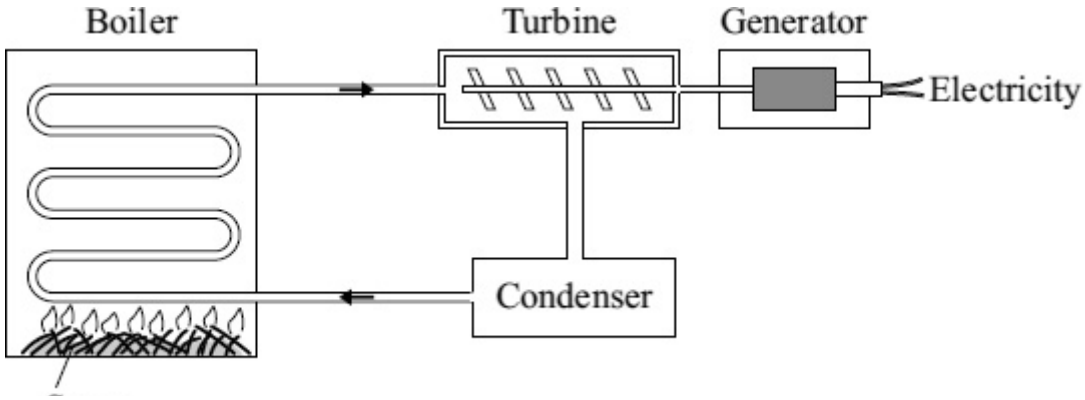
_____

_____

(1)

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

Downloaded from www.merit-minds.com



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

boiler	**gas**	**generator**	**steam**	**turbine**	**water**

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)

Downloaded from www.merit-minds.com