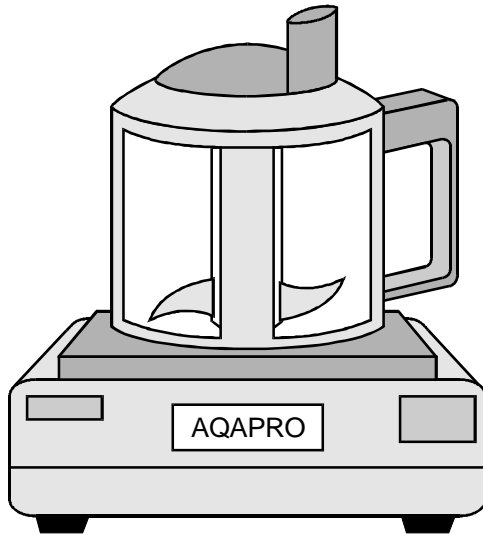


Current, charge and power

1. The drawing shows a food processor. It has an electric motor. Inside is a blade which spins round and cuts up the food.



The food processor is designed to transfer electrical energy to kinetic energy. However some of the energy is wasted as heat and sound.

The power input to the food processor is 1150 W. The power of the spinning blade is 900 W.

- (i) Calculate how much energy is wasted when the food processor is used for two minutes. Show clearly how you get to your answer and give the unit.

$$\text{power} = \frac{\text{energy transferred}}{\text{time taken}}$$

.....

Energy =

(3)

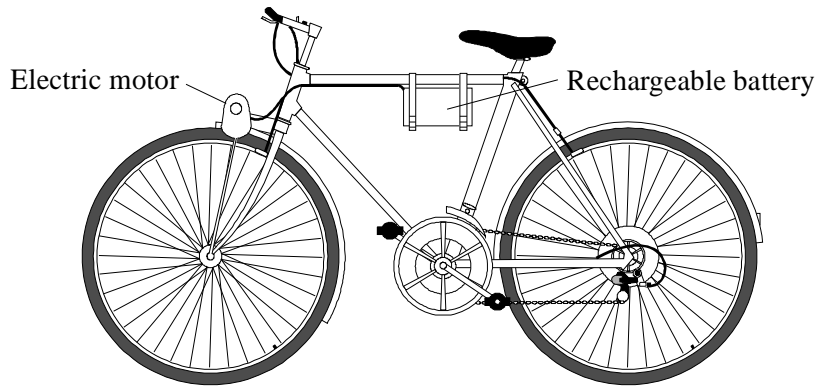
- (ii) Why does the food processor produce sound when it is switched on?

.....

(1)

(Total 4 marks)

2. The diagram shows a bicycle which can be powered by an electric motor. A rechargeable battery supplies energy to the electric motor.



When fully charged the 12 volt battery can deliver a current of 14 amperes for 30 minutes. The battery is then fully discharged.

- (i) Give the equation that links charge, current and time.

.....

(1)

- (ii) Calculate the charge stored by the battery. Show clearly how you work out your answer and give the unit.

.....

Charge =

(3)

- (iii) Use the following equation to calculate the energy available from the battery.

$$\text{voltage} = \frac{\text{energy}}{\text{charge}}$$

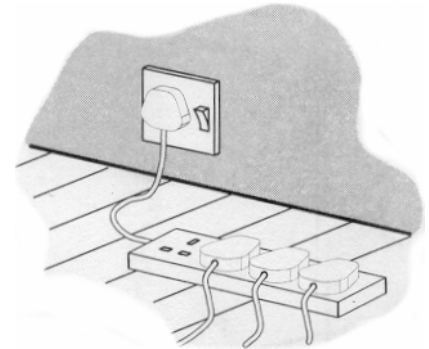
.....

Energy stored = joules

(2)

(Total 6 marks)

3. An adaptor can be used to connect up to four appliances in parallel to one 230 V mains socket. The adaptor is fitted with a 13 A fuse. The table gives a list of appliances and the current they draw from a mains socket.



Appliance	Current
computer	1 A
hairdryer	4 A
heater	8 A
iron	6 A
television	2 A

- (a) What current will flow to the adaptor when the television, computer and hairdryer are plugged into the adaptor?

.....

Current = A

(1)

- (b) Write down the equation which links current, electrical power and voltage.

.....

(1)

- (c) Calculate the electrical power used when the television, computer and hairdryer are plugged into the adaptor. Show clearly how you work out your answer and give the unit.

.....

.....

.....

Electrical power =

(2)

- (d) What would happen to the fuse if the heater is also plugged into the adaptor?
Give a reason for your answer.

.....

.....

(2)