

Name of the Student: \_\_\_\_\_

Max. Marks : 11 Marks

Time : 22 Minutes

**Q1.**

Carefully read the following extract from a safety leaflet. Then answer the questions.

An RCD adaptor is an automatic safety switch. It should be used when there is a particular risk of electric shock. For example, it is recommended that it is used with an electric lawnmower.

Inside one make of RCD is an electromagnet that holds the switch closed so that the RCD is switched on. An electronic circuit in the RCD monitors the difference between the current in the live wire and the current in the neutral wire.

If something goes wrong and this difference is greater than 30 milliamps then the RCD will trip (= switch off) within 40 milliseconds.

- (a) Suggest **two** reasons why there is a particular risk of an electric shock when using an electric lawnmower.

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

(2)

- (b) Why will there be a difference between the current in the live wire and the current in the neutral wire if something goes wrong?

\_\_\_\_\_

\_\_\_\_\_

(1)

- (c) (i) Use the words charge, current and time to write an equation which shows the relationship between them.

\_\_\_\_\_

(1)

- (ii) Calculate how much charge flows when a current of 30 milliamps passes for 40 milliseconds.

Clearly show how you get to your answer and give the unit.

\_\_\_\_\_

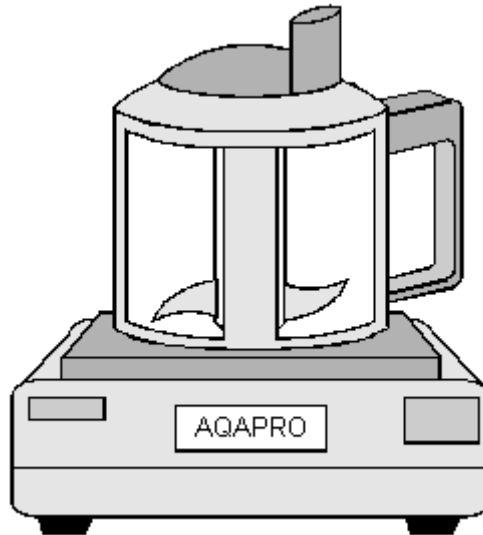
Charge = \_\_\_\_\_

(3)

(Total 7 marks)

**Q2.**

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.

\_\_\_\_\_

\_\_\_\_\_

Energy = \_\_\_\_\_

(3)

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

\_\_\_\_\_

\_\_\_\_\_

(1)

(Total 4 marks)