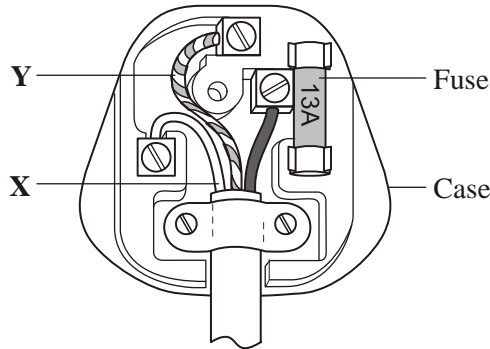


Household electricity

1. (a) The diagram shows the inside of a correctly wired three-pin plug.



(i) What colour is the insulation on the wire labelled X?

Draw a ring around your answer.

**blue      brown      green/yellow**

(1)

(ii) What name is given to the wire labelled Y?

Draw a ring around your answer.

**earth      live      neutral**

(1)

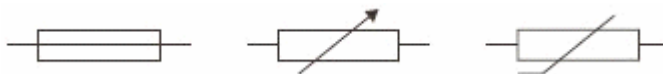
(iii) What material would be suitable for the case of the plug?

.....

(1)

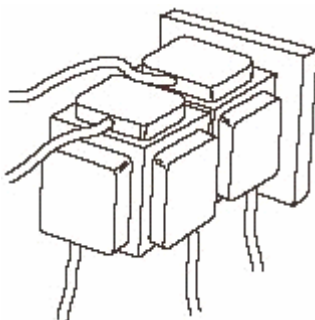
(iv) Which **one** of the following is the correct circuit symbol for a fuse?

Draw a ring around your answer.



(1)

(b) A householder does not have enough electric sockets in the kitchen. To overcome the problem, the householder uses two adaptors to plug five appliances into a single electric socket.



Explain why this is dangerous.

.....

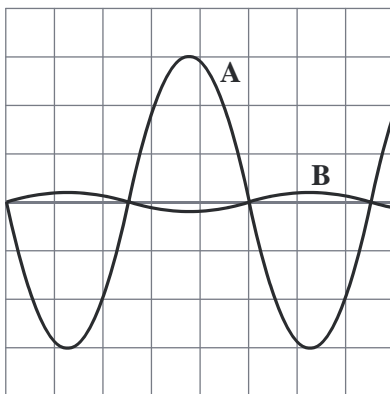
.....

.....

.....

(2)  
(Total 6 marks)

2. The diagram shows two oscilloscope traces, **A** and **B**.



Trace **A** shows how the potential difference between the live and neutral terminals of an electricity supply changes with time.

(a) Describe how the potential of the live terminal varies with respect to the neutral terminal of the electricity supply.

.....

.....

(2)

(b) What does trace **B** show?

.....

(1)

(c) Each horizontal division on the oscilloscope represents 0.005 s.

(i) What is the period of this electricity supply?

.....

Period = ..... seconds

(1)

(ii) Calculate the frequency of the supply.

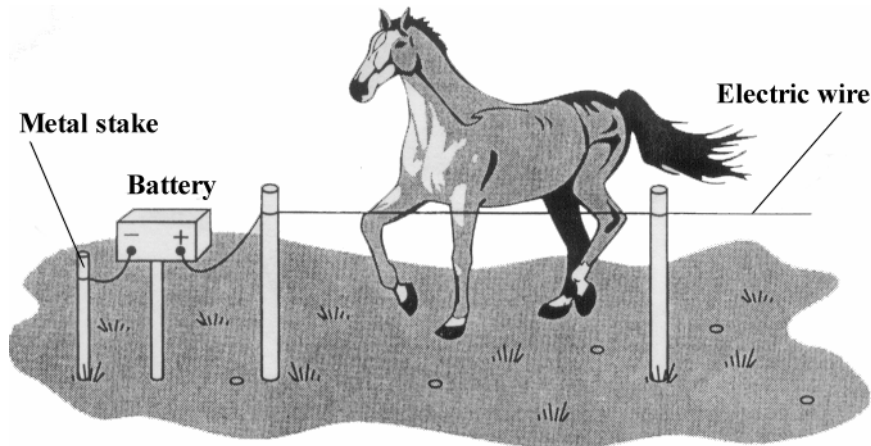
.....

Frequency = ..... hertz

(1)

(Total 5 marks)

3. (a) The diagram shows an electric fence, designed to keep horses in a field.



When a horse touches the wire the horse receives a mild electric shock. Explain how.

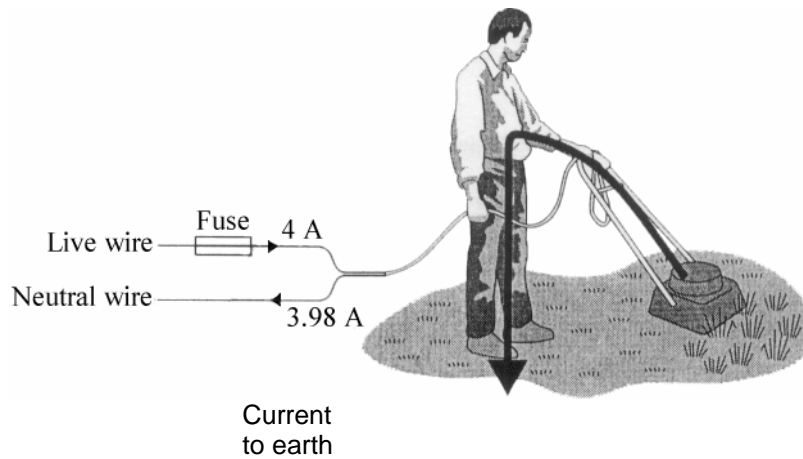
.....

.....

.....

(2)

- (b) The diagram shows how a person could receive an electric shock from a faulty electrical appliance. Using a residual circuit breaker (RCB) can help to protect the person against receiving a serious shock.



- (i) Compare the action of an RCB to that of a fuse.

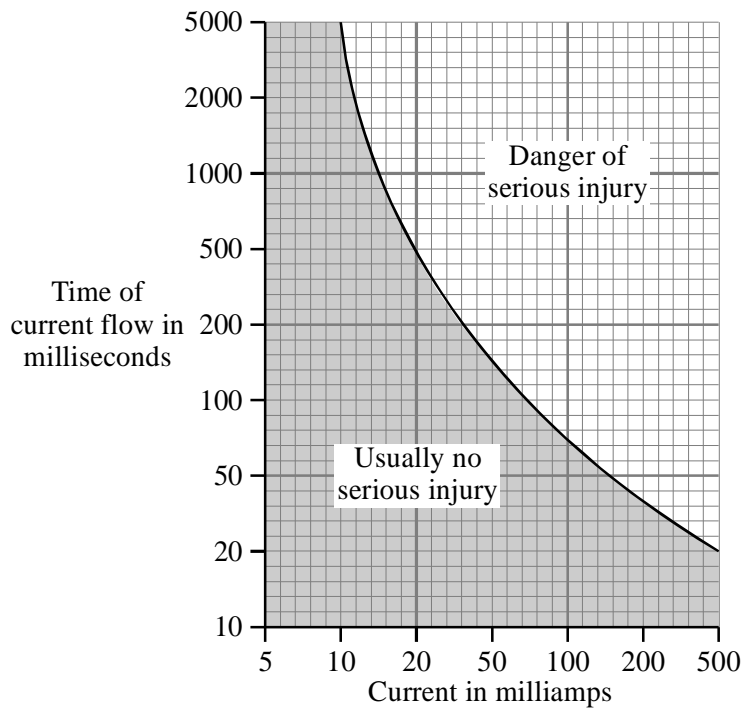
.....

.....

.....

(2)

- (ii) The graph illustrates how the severity of an electric shock depends upon both the size of the current and the time for which the current flows through the body.



Within how long must the RCB cut off the current if the person using the lawnmower is to be in no danger of serious injury?

.....  
 .....

Time = ..... milliseconds

(2)  
 (Total 6 marks)