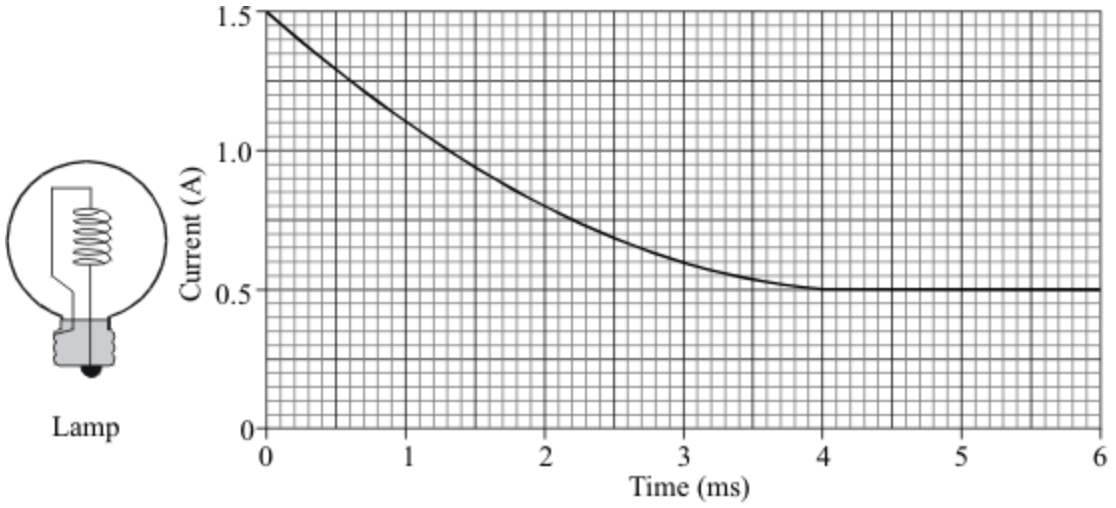
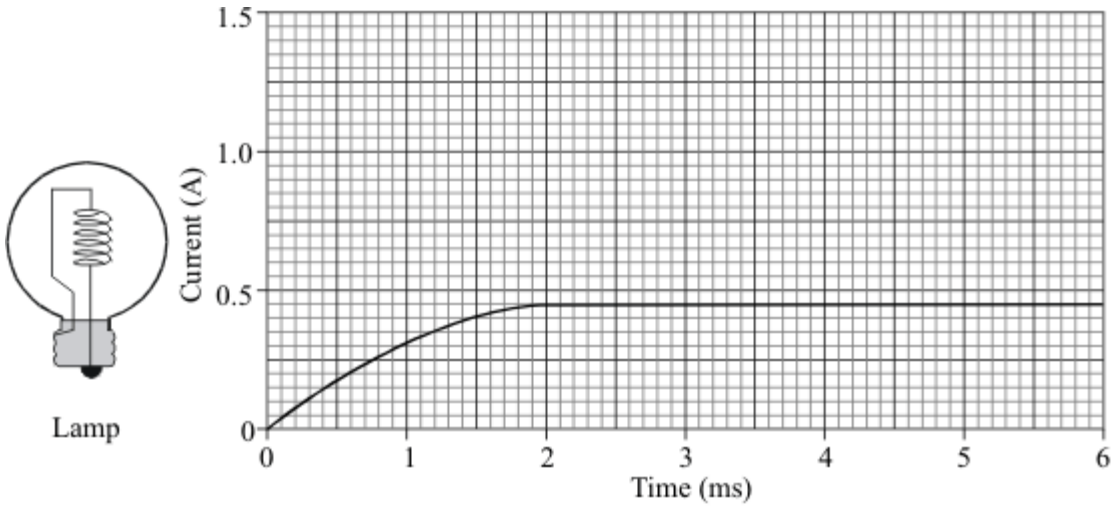
Name of the Student:_____
Max. Marks : 25 Marks **Time : 25 Minutes**

Q1.

A computer is set up to produce a graph of the current through an electric lamp during the first few milliseconds after it is switched on.



The lamp is modified then tested in the same way.



(a) Describe **three** differences in the way the lamp behaves after it has been modified.

1. _____

2. _____

3. _____

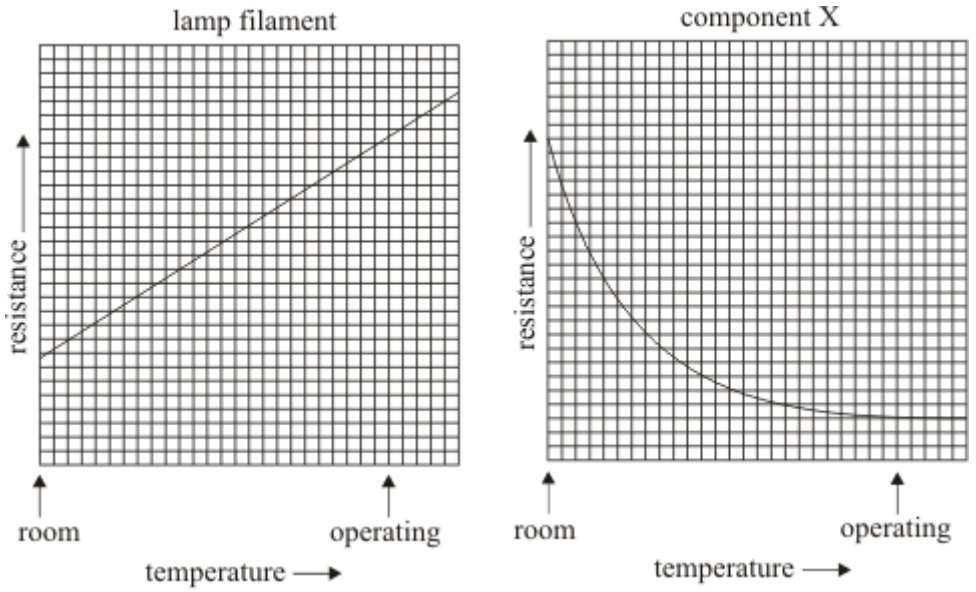
(3)

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(b) The current through the modified lamp depends on the total resistance of the filament and component X.

The smaller this total resistance is, the greater the current.

The following graphs show how the resistance of the lamp filament and component X change as the lamp heats up to its operating temperature.



Use the information shown on the graphs to explain the behaviour of the modified lamp.

_____

_____

_____

_____

_____

_____

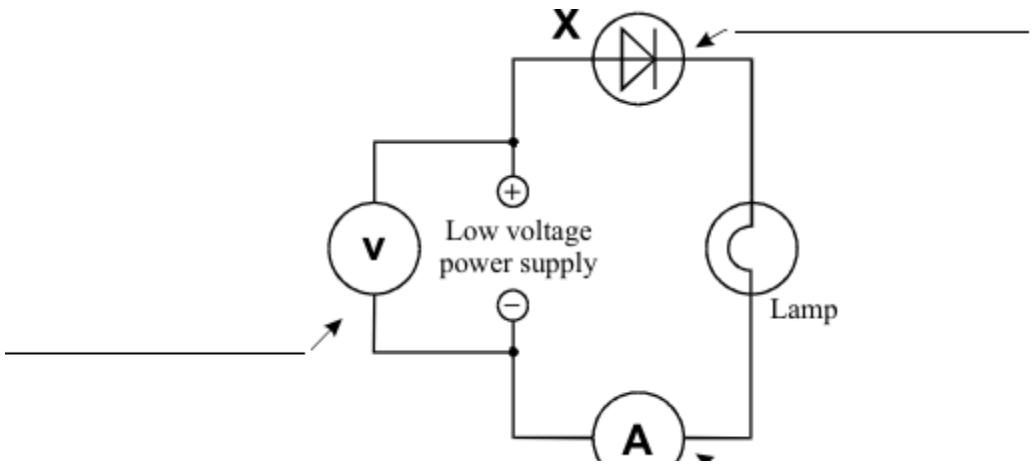
(4)

(Total 7 marks)

Q2.

(a) Add the missing labels to the diagram.

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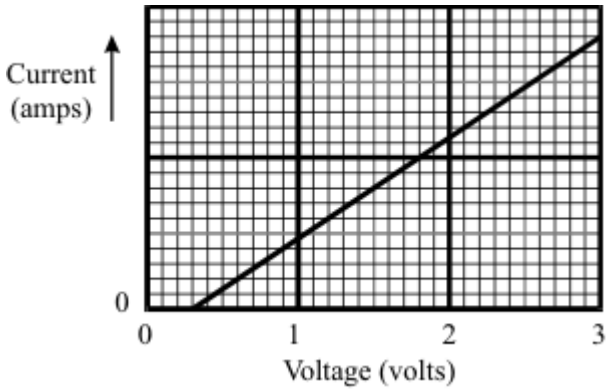


(3)

(b) Some students use the circuit shown above.

They want to find out how the current through component X changes as they change the voltage.

The graph shows their results.



Describe, as fully as you can, what happens to the current through component X as the students increase the voltage.

_____

_____

_____

_____

_____

(4)

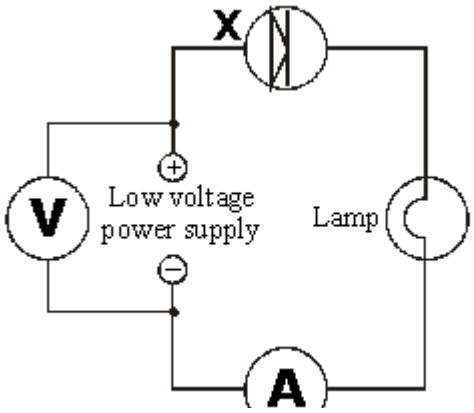
(Total 7 marks)

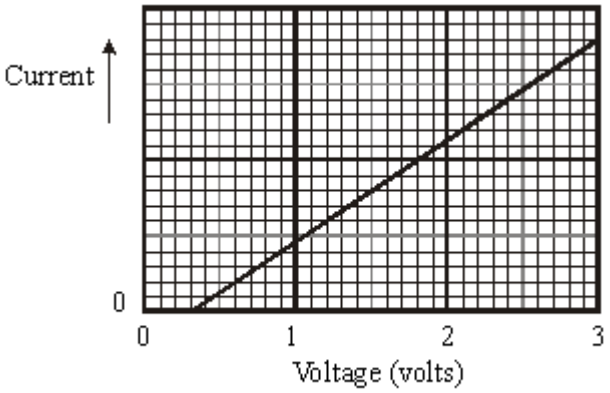
Q3.

Some students want to find out how the current through component X changes with the voltage they use.

The diagram shows their circuit. The graph shows their results.

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(a) Describe, as fully as you can, what happens to the current through component X as the students increase the voltage.

_____

_____

_____

(4)

(b) The students want to find out whether component X allows the same current to flow through it in the opposite direction.

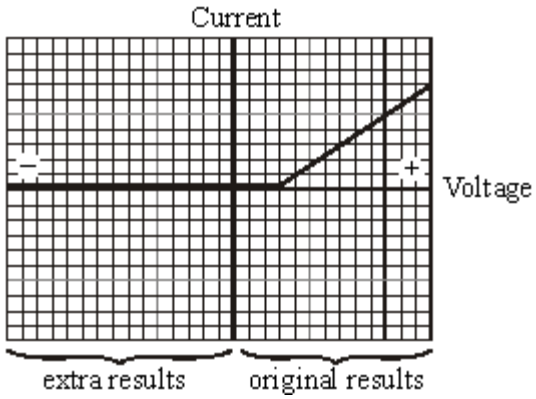
(i) How should they change the circuit to test this?

_____

(1)

(ii) The graph shows the students' extra results.

What do the extra results tell you?



_____

_____

_____

(1)

(Total 6 marks)

Q4.

A hairdryer is supplied with 800 J of energy every second.

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(a) Describe **all** the energy transfers that take place in the hairdryer when it is being used.

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(b) Why must the total energy output of the hairdryer always equal the total energy input to the hairdryer?

_____

_____

(1)

(Total 5 marks)

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