

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Q1.

A student is investigating a filament lamp.

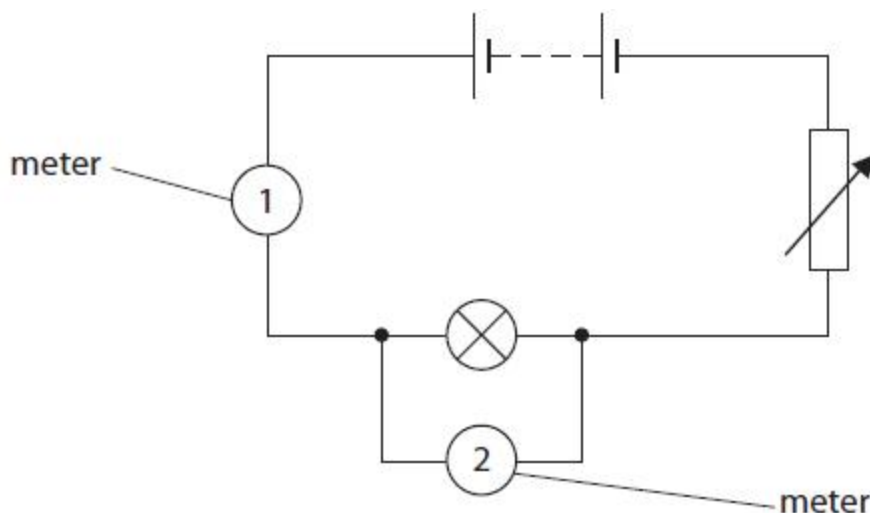
(a) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The current in the filament lamp is a flow of

- A** protons
- B** neutrons
- C** electrons
- D** atoms

(1)

(ii) The student uses this circuit in his investigation.



State what is measured by the meters.

(2)

Meter 1 measures

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Meter 2 measures

.....

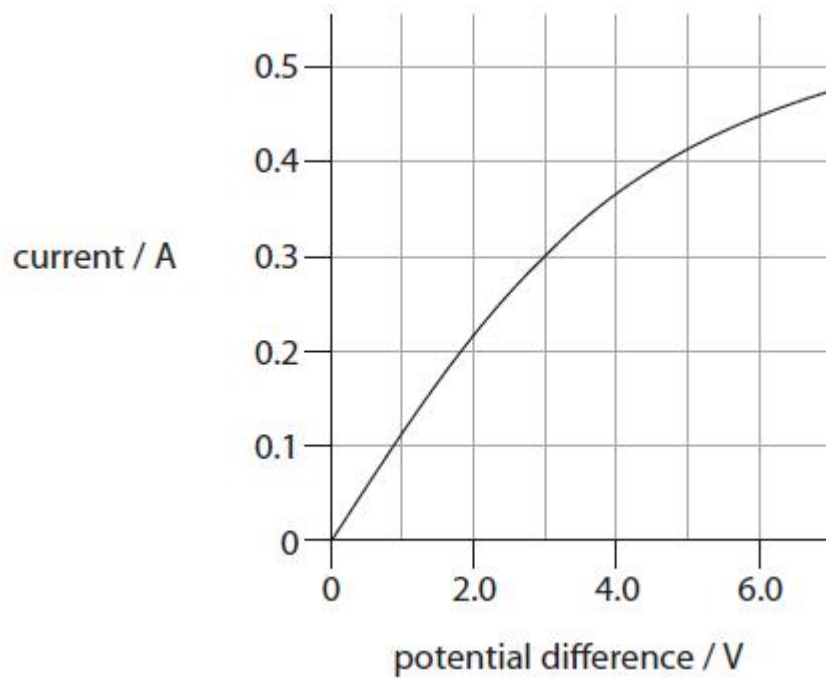
(b) The normal operating potential difference (voltage) and current of the filament lamp is 6 V, 0.4 A.

Calculate the energy supplied to the lamp under these conditions in 20 s.

(2)

energy = J

(c) The graph shows how current varies with potential difference (voltage) for another filament lamp.



Calculate the resistance of the lamp when the current in the lamp is 0.3 A.

resistance = potential difference \div current ($R = V / I$)

(3)

resistance = Ω

(Total for Question = 8 marks)

Q2.

A long piece of wire is made into a coil as shown in Figure 22.

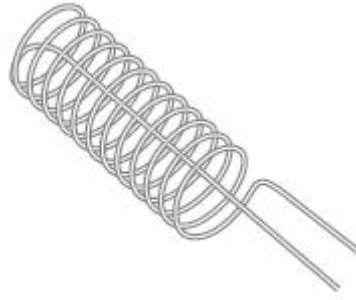


Figure 22

The coil is connected to a low voltage power supply.

Describe how this coil could be used instead of the Bunsen burner in Figure 20.

(2)

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(Total for question = 2 marks)

Q3.

A student investigates resistors connected in series in an electrical circuit.

The student has

- a 3.0 V battery
- a 22 Ω resistor
- a resistor marked X. The student does not know the value of the resistor marked X.

The student decides to measure the potential difference (voltage) across resistor X.

Figure 15 shows the circuit that the student connected.

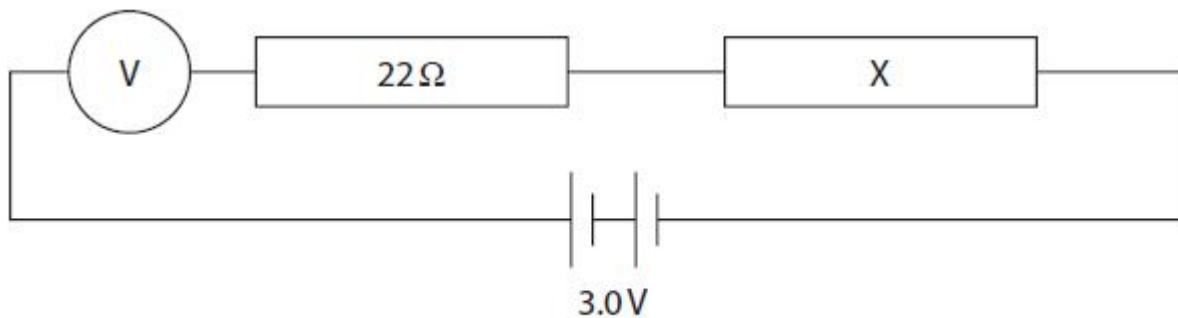


Figure 15

The circuit is connected incorrectly.

Describe how the student should correct the mistake.

(2)

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(Total for question = 2 marks)

Q4.

*Figure 23 shows a drone.



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Figure 23

The blades on the drone are turned by electric motors.

The electric motors are powered by a battery.

Figure 25 represents the energy transfers involved when the drone rises from the ground.

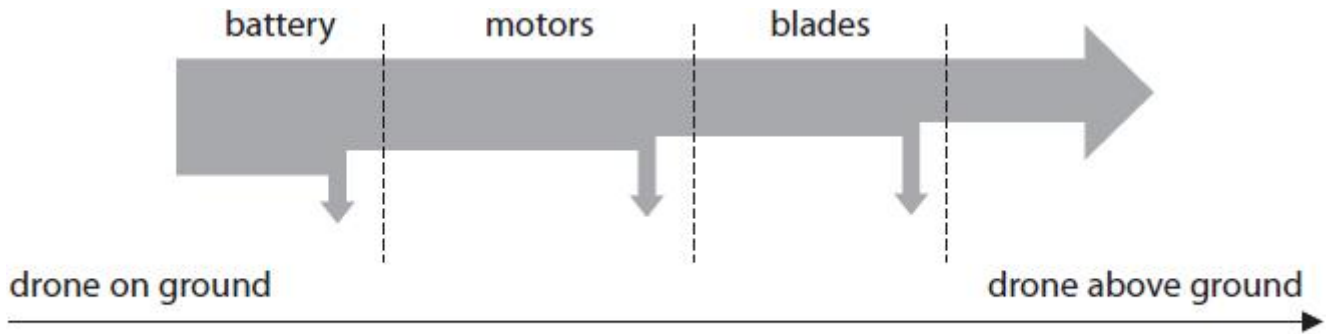


Figure 25

Describe the changes in the way energy is stored when the drone rises from the ground.

Your answer should refer to energy transfers.

(6)

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(Total for question = 6 marks)