Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Q1.

(a) Complete the sentence. Choose answers from the box.

charge	**potential difference**	**power**	**temperature**	**time**

The current through an ohmic conductor is directly proportional to the

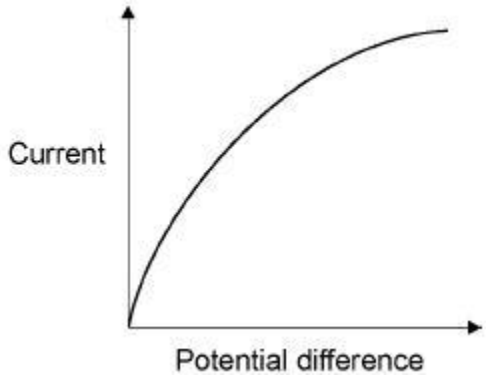
_____ across the component, provided

that the _____ remains constant.

(2)

(b) **Figure 1** shows a current − potential difference graph for a filament lamp.

Figure 1



Explain how the resistance of a filament lamp changes as the potential difference across it increases.

_____

_____

_____

_____

_____

_____

(3)

(c) Many householders are replacing their filament lamps with LED lamps which are more energy

efficient.

What does more energy efficient mean?

_____

_____

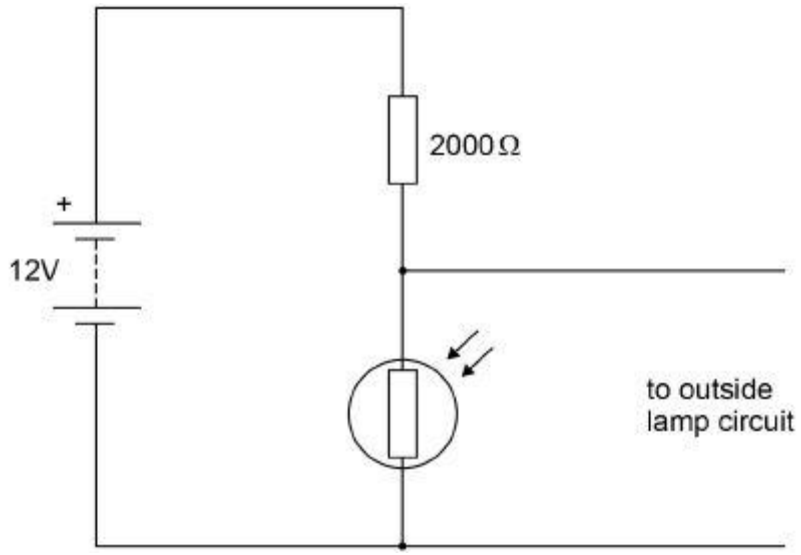
_____

(1)

A Light Dependent Resistor (LDR) is used to turn on an outside lamp when it gets dark.

Part of the circuit is shown in **Figure 2**.

Figure 2



(d) The light intensity decreases.

What happens to the potential difference across the LDR and the current in the LDR?

Potential difference _____

Current _____

(2)

(e) What is the resistance of the LDR when the potential difference across it is 4 V?

Give a reason for your answer.

Explain your answer.

Resistance = _____ Ω

Reason _____

_____

_____

(2)

(f) Calculate the current through the LDR when the resistance of the LDR is 5000 Ω.

Give your answer to 2 significant figures.

_____

_____

_____

_____

Current = _____ A

(4)

(Total 14 marks)

Q2.

The photograph below shows a coffee machine. The coffee machine uses an electric element to heat water.

(a) The coffee machine has a metal case.

Why would it be dangerous for the live wire of the electric cable to touch the metal case?

_____

_____

(1)

(b) The power output of the coffee machine is 2.53 kW.

The mains potential difference is 230 V.

Calculate the current in the coffee machine.

_____

_____

_____

_____

Current = _____ A

(3)

(c) The coffee machine heats water from 20 °C to 90 °C.

The power output of the coffee machine is 2.53 kW.

The specific heat capacity of water is 4200 J/kg °C.

Calculate the mass of water that the coffee machine can heat in 14 seconds.

_____

_____

_____

_____

_____

Mass = _____ kg

(5)

(Total 9 marks)