

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

A student investigates how the current in a lamp changes with the potential difference across the lamp.
 The student uses the results to calculate the resistance of the lamp.

The results are shown in the table in Figure 17.

potential difference in V	current in A	resistance in Ω
1.0	0.09	11
2.0	0.14	14
3.0	0.18	17
4.0	0.22	18
5.0	0.26	
6.0	0.30	20

Figure 17

- (i) One value of resistance is missing from the table in Figure 17.

Calculate the value of resistance that is missing from the table.

(3)

missing resistance = ... Ω

- (ii) The student writes this conclusion:

'The resistance of the lamp is directly proportional to the potential difference.'

Comment on the student's conclusion.

Use information from Figure 17 in your answer.

(3)

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(Total for question = 6 marks)

Q2.

When the current in a lamp is 0.15 A, the resistance of the lamp is 40 Ω .

Calculate the voltage across the lamp.

Use the equation

$$V = I \times R$$

(2)

voltage = ... V

(Total for question = 2 marks)

Q3.

A lamp is connected to a potential difference of 0.24 V.

The current in the lamp is 0.12 A.

(i) Calculate the power of the lamp.

Use the equation

$$P = I \times V$$

(2)

power of the lamp = ... W

(ii) The potential difference is changed to 0.30 V.

The current in the lamp is now 0.13 A.

The lamp is switched on for 35 s.

Calculate the energy that is transferred in this time.

Select an equation from the list of equations at the end of this paper.

(2)

energy transferred = ... J

(iii) The current in the lamp stays at 0.13 A.

Calculate the charge that flows through the lamp in 35 s.

Use the equation

$$Q = I \times t$$

(2)

charge = ... C

(Total for question = 6 marks)

Q4.

Figure 4 shows the inside of a mains plug.

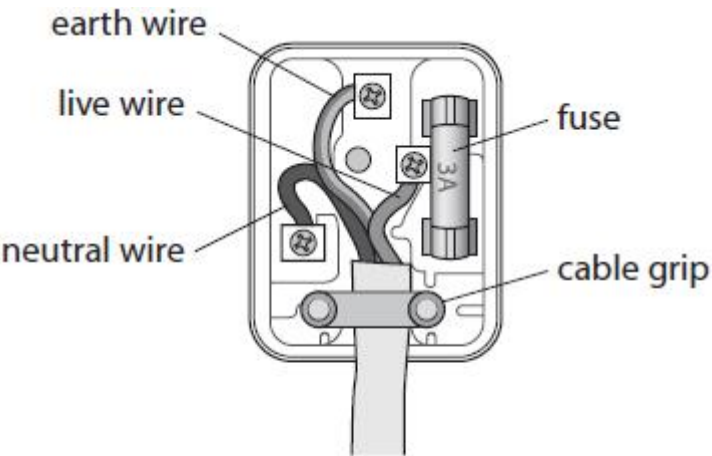


Figure 4

The mains plug has three safety features.
One of these safety features has been ticked in the table.
Put **two** more ticks in the table to show the other two safety features.

(2)

part of plug	safety feature
cable grip	✓
earth wire	
fuse	
live wire	
neutral wire	

(Total for question = 2 marks)

Q5.

A student measures the current in the lamp for several values of potential difference across the lamp. Figure 13 shows the student's results.

potential difference across the lamp in volts (V)	current through the lamp in amps (A)
0.06	0.05
0.12	0.08
0.18	0.10
0.24	0.12
0.30	0.13
0.36	0.13

Figure 13

The student uses the results in Figure 13 to write this conclusion.

'As the potential difference across the lamp increases, the current in the lamp increases and the relationship is directly proportional.'

Comment on the student's conclusion.

(3)

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(Total for question = 3 marks)