Name of the Student:_____

Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

Figure 1 shows a mobile phone being recharged by a portable power source.

Figure 1

(a) Why does the battery in the phone need recharging?

Tick **one** box.

The store of chemical energy in the battery has reduced.	☐
The store of thermal energy in the battery has reduced.	☐
The store of kinetic energy in the battery has reduced.	☐
The store of gravitational energy in the battery has reduced.	☐

(1)

(b) The power source provides a current of 1.86 A at a potential difference of 3.90 V

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Calculate the power of the power source.

Use the equation:

power = potential difference × current

Choose the correct unit from the box.

C	J	W

_____

_____

_____

Power = _____

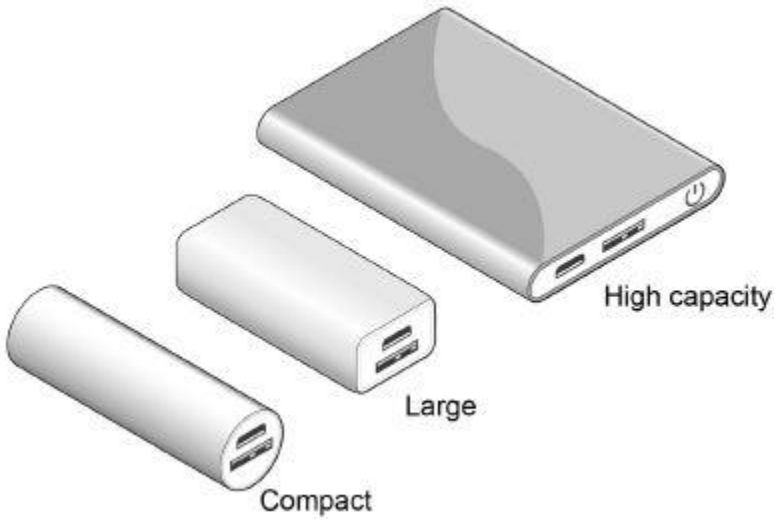
Unit _____

(3)

(c) A student needs a new power source.

Figure 2 shows three different sized power sources.

Figure 2



The table below gives data about the different power sources.

Power source	Number of charges	Mass in grams
Compact	1	100
Large	5	200
High capacity	10	600

The student chose the large power source.

Suggest why the student chose the large power source.

_____

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(4)

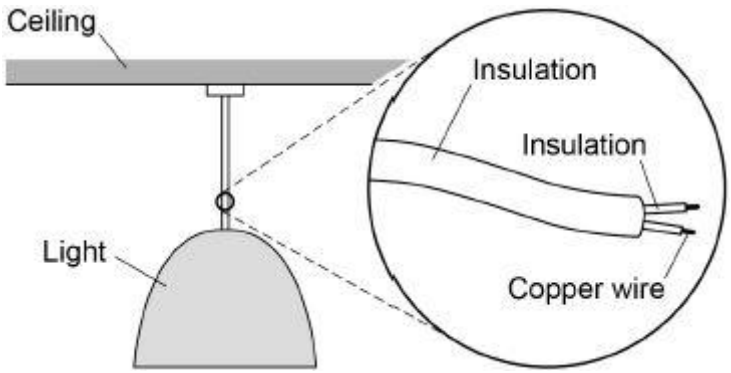
(Total 8 marks)

Q2.

Some ceiling lights in the home are connected to the mains by a two-core cable.

Figure 1 shows a ceiling light.

Figure 1



(a) Suggest why some ceiling lights do **not** have an earth wire.

(2)

(b) Write down the equation that links charge flow, current and time.

(1)

(c) There is a current of 2.95 A in one of the copper wires for 60 seconds.

Calculate the charge flow through the wire.

Use your equation from part **(b)**

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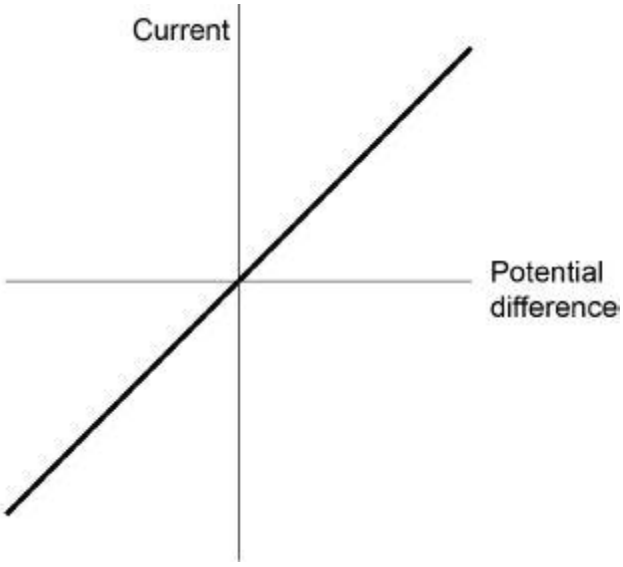
Charge flow = _____ C

(2)

(d) **Figure 2** shows a current potential difference graph for a piece of copper wire.

Figure 2



Draw another line on **Figure 2** for a wire with a different resistance.

(2)

Some fuses have a thin piece of copper that melts if the current is too large.

(e) Draw the circuit symbol for a fuse.

(1)

(f) Describe how the movement of the copper particles in the wire changes when copper melts.

_____

_____

_____

_____

(2)

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(g) Old copper wires are melted when they are recycled.

Calculate the energy needed to melt 500 kg of copper at its melting point.

Specific latent heat of fusion of copper = 200 kJ/kg

Use the Physics Equations Sheet.

_____

_____

Energy = _____ J

(3)

(Total 13 marks)

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