

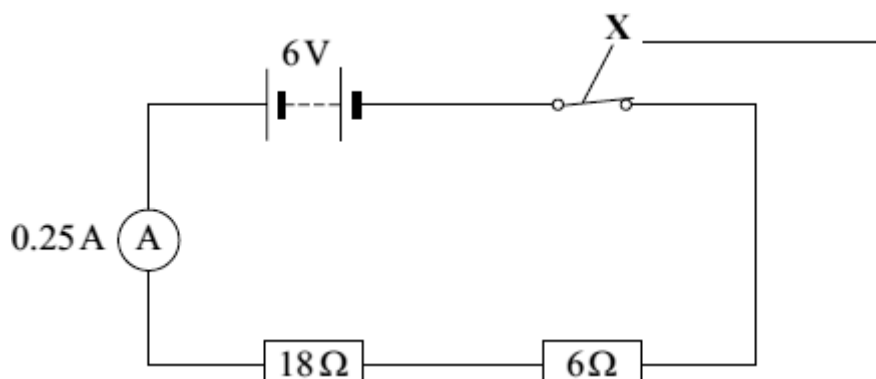
Name of the Student: _____

Max. Marks : 24 Marks

Time : 24 Minutes

Q1.

A circuit diagram is shown below.



- (a) Use a word from the box to label component X.

fuse	switch	thermistor
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(1)

- (b) Calculate the total resistance of the two resistors in the circuit.

Total resistance = _____ Ω

(1)

- (c) The reading on the ammeter is 0.25 A.

The current through the 6 Ω resistor will be:**bigger than 0.25 A equal to 0.25 A smaller than 0.25 A**

Draw a ring around your answer

(1)

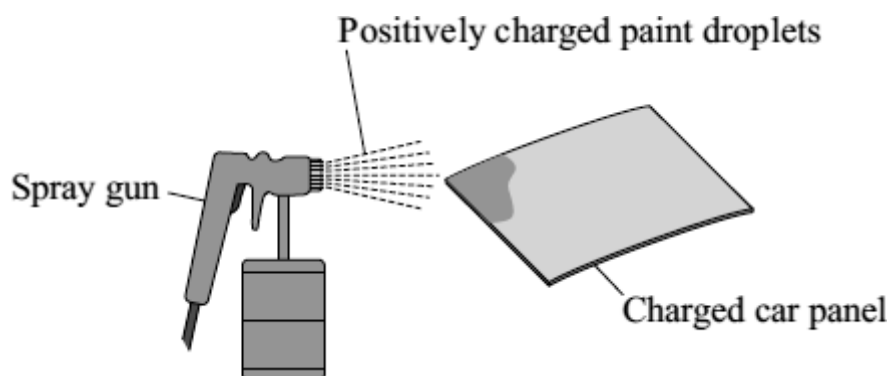
- (d) The 6 V battery is made by correctly joining several 1.5 V cells in series.

Calculate the number of cells needed to make the battery.

Number of cells = _____

Q2.

- (a) The diagram shows how static electricity is used to paint a metal car panel.



Use words from the box to complete the following sentences.

attract

opposite

repel

same

All the paint droplets have the same type of charge. This makes the paint droplets _____ each other and spread out.

The car panel and the paint droplets have the _____ type of charge. This causes the car panel to _____ the paint droplets.

The car panel is covered by an even layer of paint.

(3)

- (b) In which **one** of the following situations is static electricity dangerous and not useful?

Put a tick (✓) in the box next to your answer.

using a photocopier

☐

refuelling an aircraft

☐

a smoke precipitator

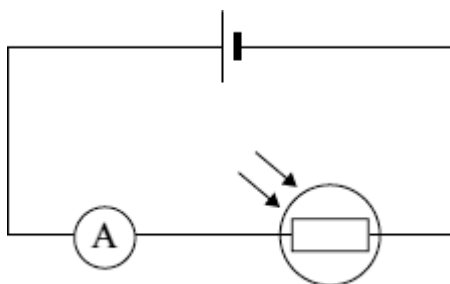
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Give a reason for your answer.

(2)
(Total 5 marks)

Q3.

The diagram shows a simple circuit.



- (a) The circuit includes an LDR.

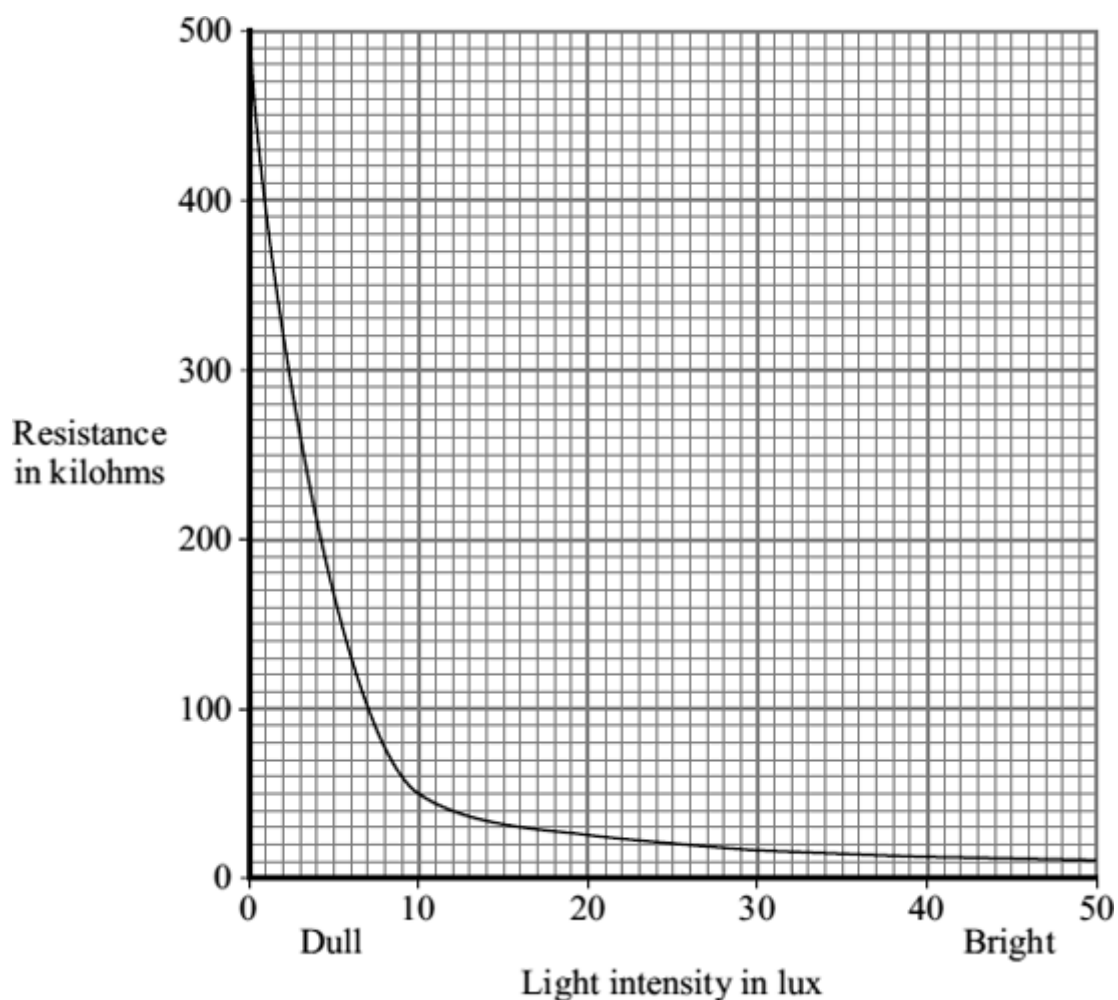
What do the letters LDR stand for?

Draw a ring around your answer.

Light-dependable resistor light-dependent resistor light-direct resistor

(1)

- (b) The graph shows how the resistance of an LDR changes with light intensity.



Describe in detail how the resistance of the LDR changes as the light intensity increases from 0 to 50 lux.

(3)

- (c) (i) Complete the following sentence by drawing a ring around the correct line in the box.

A decrease in the light intensity of light on the LDR will

decrease	the
not change	
increase	

reading on the ammeter.

(1)

- (ii) Give a reason for your answer to part (c)(i).

(1)

- (d) An LDR can be used to switch a circuit on and off automatically.

In which **one** of the following would an LDR be used?

Put a tick (✓) in the box next to your answer.

a circuit to switch on central heating when it gets cold

☐

a circuit to switch on security lighting when it gets dark

☐

a circuit to switch on a water sprinkler when the soil in a greenhouse is dry

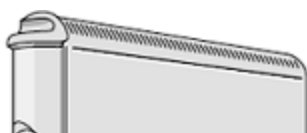
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(1)

(Total 7 marks)

Q4.

- (a) The diagram shows two switches on a room heater. The heater has three power settings. The power produced by two of the settings is given in the table.



Setting	Power in kW
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Low	0.5
Medium	1.5
High	

- (i) When both switches are on, the heater works at the high power setting.

What is the power of the heater when it is switched to the **high** power setting?

Power = _____ kW

(1)

- (ii) The heater is used on the **medium** power setting. It is switched on for three hours.

Use the equation in the box to work out the energy transferred from the mains to the heater in three hours.

energy transferred (kilowatt-hour, kWh)	=	power (kilowatt, kW)	×	time (hour, h)
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Show clearly how you work out your answer.

Energy transferred = _____ kWh

(2)

- (iii) Electricity costs 12 pence per kilowatt-hour.

Use the equation in the box to calculate how much the heater costs to use on **medium** power for three hours.

total cost	=	number of kilowatt-hours	×	cost per kilowatt-hour
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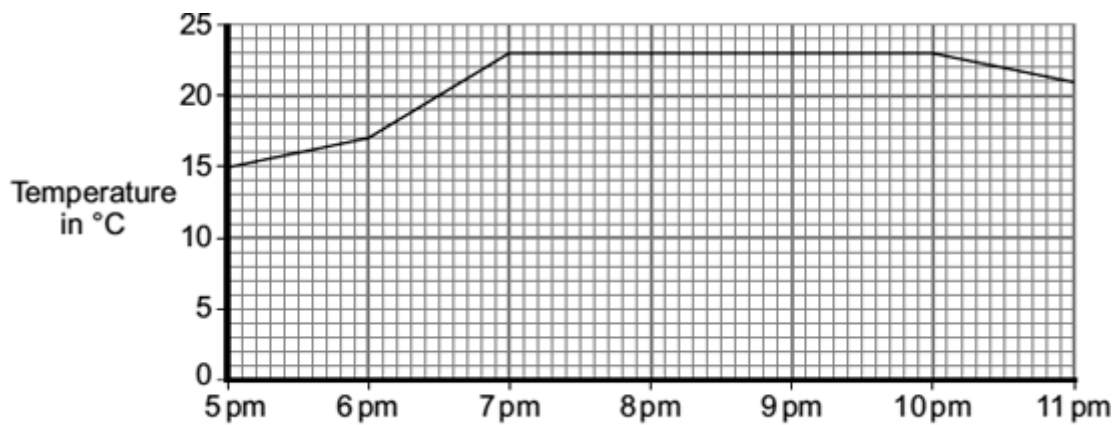
Show clearly how you work out your answer.

Total cost = _____ pence

(2)

- (b) The heater is used to warm a room.

The graph shows how the temperature of the room changes from the moment the heater is switched on.



The heater was first used on the medium setting.

- (i) At what time was the heater setting changed to the **high** setting?

Give a reason for your answer.

(2)

- (ii) From 7 pm until 10 pm, the temperature of the room is **not** changing.

Which **one** of the following statements gives the reason why the temperature of the room is **not** changing?

Put a tick (✓) in the box next to your answer.

The room is losing energy slower than the heater supplies energy.

☐

The room is losing energy as fast as the heater supplies energy.

☐

The room is losing energy faster than the heater supplies energy.

☐

(1)

(Total 8 marks)