

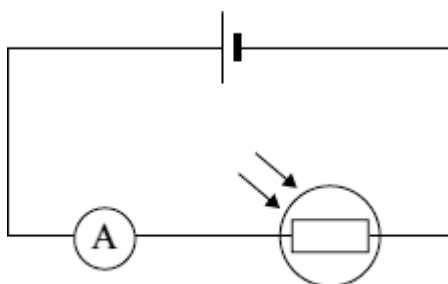
Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Q1.

The diagram shows a simple circuit.



- (a) The circuit includes an LDR.

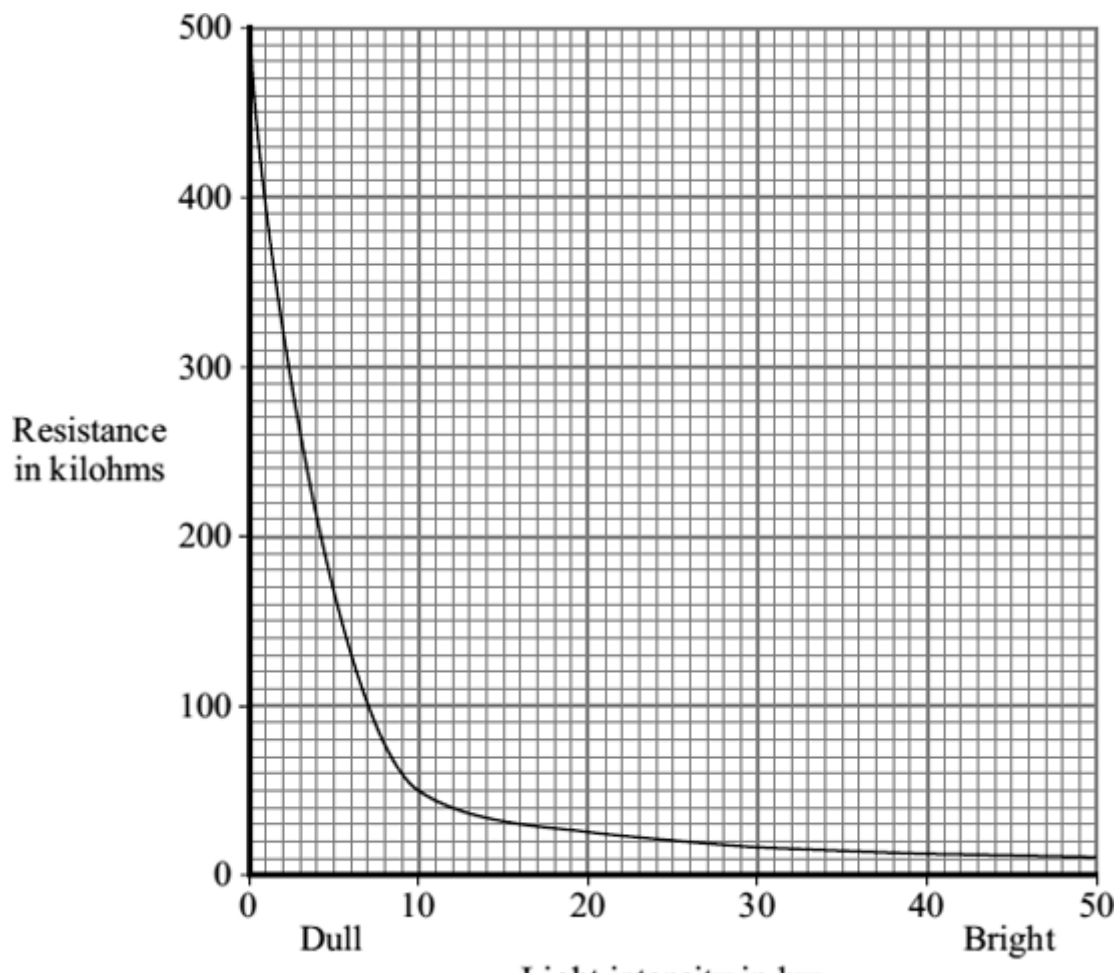
What do the letters LDR stand for?

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

not change the

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

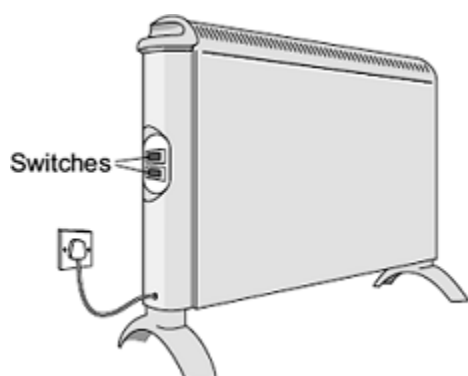
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(1)

(Total 7 marks)

Q2.

- (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
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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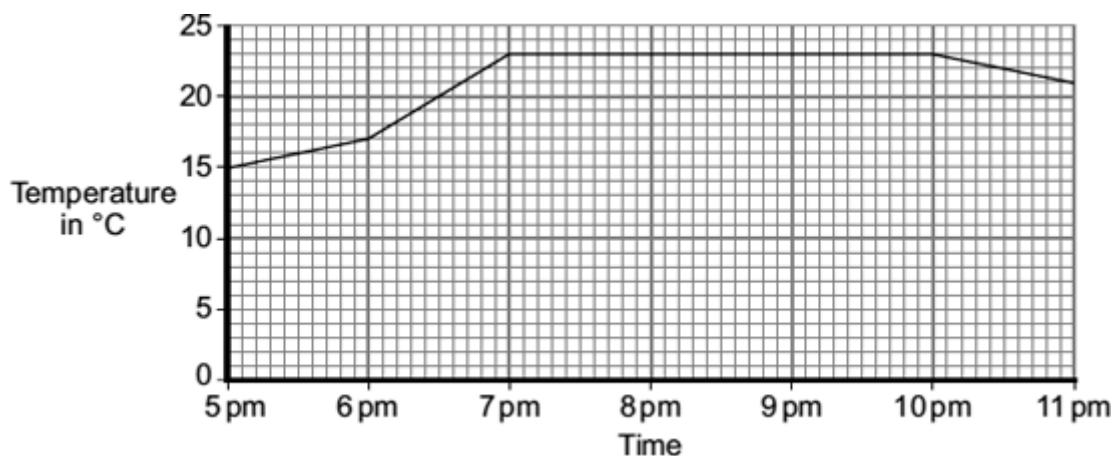
Show clearly how you work out your answer.

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.

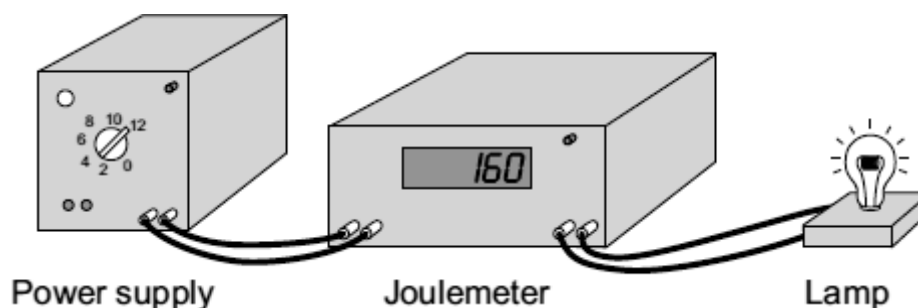
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(1)

(Total 8 marks)

Q3.

A student used a joulemeter to measure the energy transformed by a lamp.



The student set the joulemeter to zero, and then switched on the power supply.

After 120 seconds (2 minutes), the reading on the joulemeter had increased to 2880.

- (a) In the space below, draw the circuit symbol used to represent a lamp.

(1)

- (b) (i) Use the equation in the box to calculate the power of the lamp.

$$\text{power} = \frac{\text{energy transformed}}{\text{time}}$$

Show clearly how you work out your answer.

Power = _____ (2)

(ii) Which **one** of the following is the unit of power?

Draw a ring around your answer.

joule

newton

watt

(1)

(c) Complete the following sentence using one of the phrases from the box.

larger than	the same as	smaller than
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If the lamp was left switched on for 10 minutes, the amount of energy transformed would be _____ the amount of energy transformed in 2 minutes.

(1)
(Total 5 marks)