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SURNAME:

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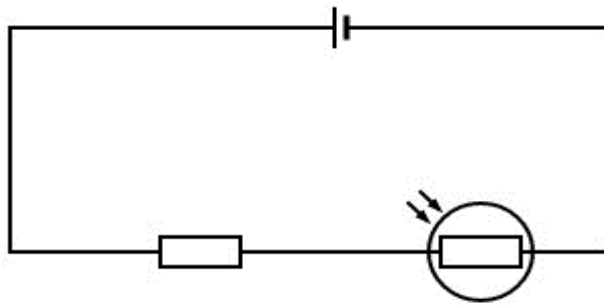
Malvern College Academic Scholarship Examinations 2024

PHYSICS

Please read this information before the examination starts:

- It is recommended you spend 20-minutes on this section.
- Answer all questions

Q1. A Light dependant resistor is placed in a series circuit with a normal resistor as shown:



- a) Another way of connecting the resistor and the LDR together would have been in parallel, in the space below draw the LDR and the resistor connected in parallel

[2]

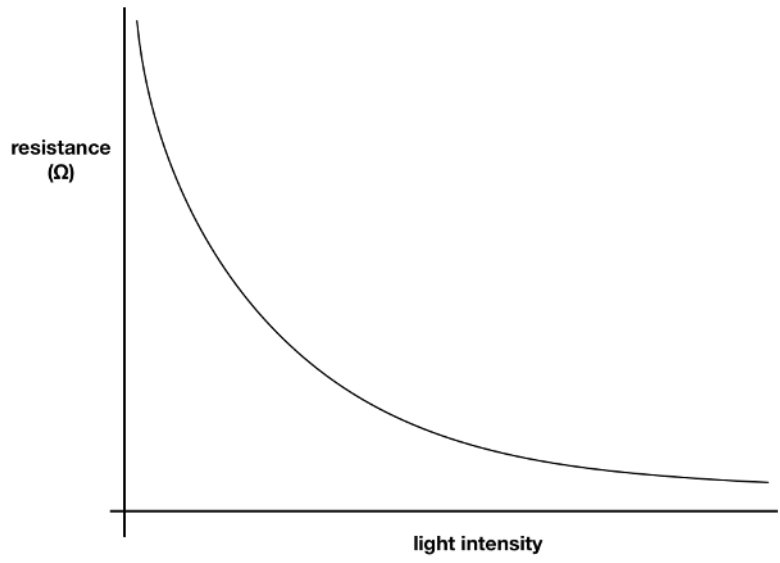
- b) What is the function of the resistor in the circuit?

[1]

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Questions continue over the page

In the original series circuit the resistance in the light dependant resistor depends on the light intensity in the room as shown below:



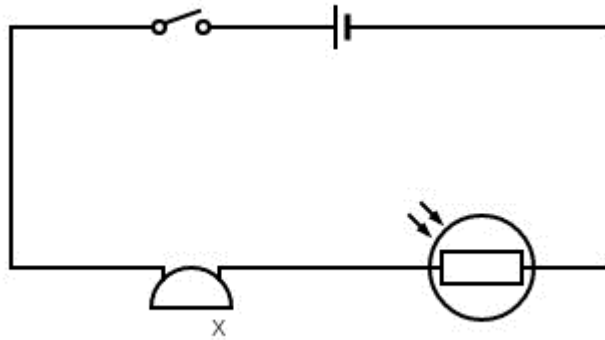
- c) Describe what happens to the resistance of the light dependant resistor as the amount of light shining on it increases. [1]

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Questions continue over the page

The resistor is replaced with a new component – labelled X.



d) Identify component X and explain what will happen when the switch is pushed. [2]

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e) This circuit is then taken to a dark room and the switch is pushed. Explain what will happen. [3]

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f) Can you think of an example of where this circuit would be useful, and explain how it would be used. [2]

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Questions continue over the page

Q2. This question is about the Earth and space flight.

a) The Earth rotates on its axis every 24 hours. The radius of the Earth is $6.4 \times 10^6\text{m}$.

(i) Determine the circumference of the Earth using, $C=2\pi r$ [1]

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(ii) Determine the number of seconds in 1 day [1]

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(iii) Calculate the speed of a person standing on the equator in m/s [1]

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b) A space rocket needs a fast launch speed to reach orbit above the Earth's atmosphere. Explain why rockets tend to be launched from the equator rather than from the poles of the Earth. [2]

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c) The old Space shuttles were fitted with heat resistant tiles for re-entry to the Earth. Explain why the space shuttle became hot when it re-entered the Earth's atmosphere. [3]

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d) Satellites are being used to look for life on other planets. Explain why they would probably not expect to find life on Neptune. [2]

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