

# Electric Circuits & Electrical Safety

## Question Paper

|            |                                       |
|------------|---------------------------------------|
| Course     | CIE IGCSE Physics                     |
| Section    | 4. Electricity & Magnetism            |
| Topic      | Electric Circuits & Electrical Safety |
| Difficulty | Hard                                  |

Time Allowed      20

Score                /9

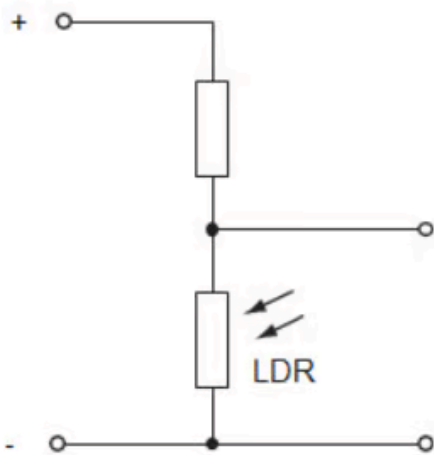
Percentage        /100

## Question 1

### Extended tier only

A homeowner buys a security light that switches on automatically when it gets dark.

The security light contains the circuit, shown below.



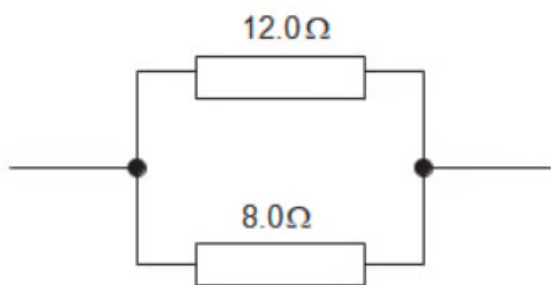
When it gets dark, what happens to the resistance of the LDR, and what happens to the potential difference across the LDR?

|          | Resistance of LDR | p.d. across LDR |
|----------|-------------------|-----------------|
| <b>A</b> | increases         | increases       |
| <b>B</b> | decreases         | increases       |
| <b>C</b> | increases         | decreases       |
| <b>D</b> | decreases         | decreases       |

[1 mark]

**Question 2****Extended tier only**

Two resistors are connected in parallel.



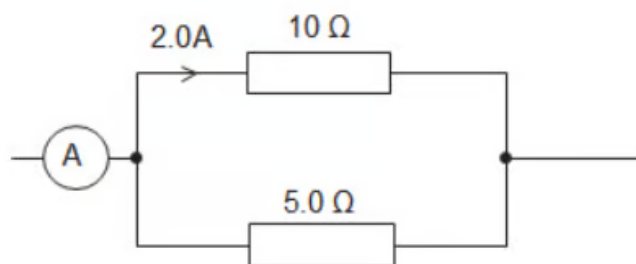
What is the combined resistance of the combination?

- A.  $20\,\Omega$
- B.  $4.8\,\Omega$
- C.  $0.21\,\Omega$
- D.  $1.5\,\Omega$

[1 mark]

**Question 3****Extended tier only**

Two resistors are connected in parallel.



The current through the top resistor is  $2.0\text{ A}$ .

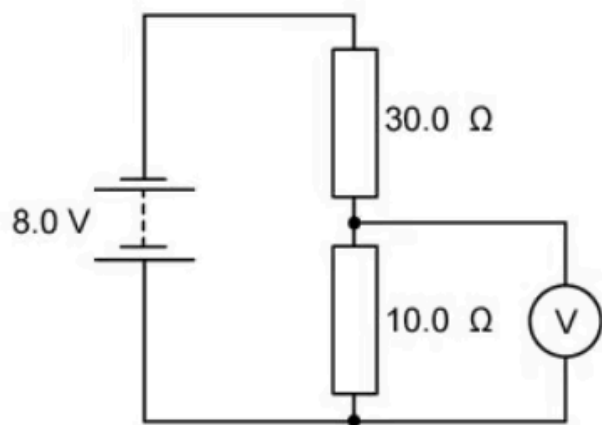
What is the reading on the ammeter?

- A.  $6.0\text{ A}$
- B.  $2.0\text{ A}$
- C.  $4.0\text{ A}$
- D.  $3.5\text{ A}$

[1 mark]

**Question 4****Extended tier only**

A  $10\ \Omega$  and a  $30\ \Omega$  resistor are connected in series, as shown in the diagram below, making a potential divider circuit.



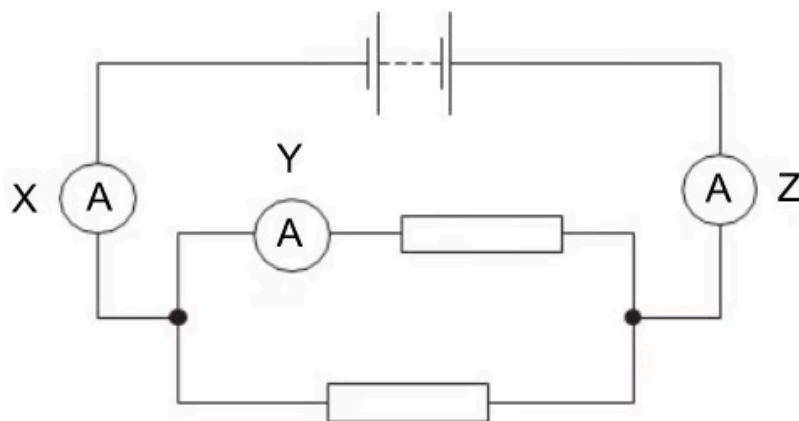
What would be the reading on the voltmeter?

- A. 2.0 V
- B. 6.0 V
- C. 4.0 V
- D. 8.0 V

[1 mark]

### Question 5

Which of the following statements about the current in ammeters **X**, **Y** and **Z** is correct?



- A. The current through X equals the current through Y + the current through Z.
- B. The current through X is equal to the current through Z.
- C. The current through X is equal to the current through Y.
- D. The current through Y is greater than the current through Z.

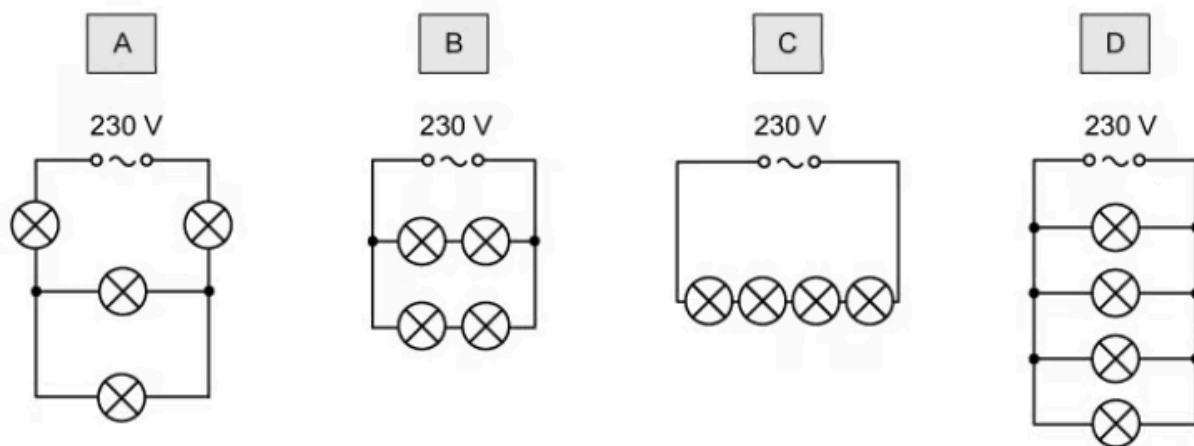
[1 mark]

## Question 6

### Extended tier only

All the light bulbs in the diagrams above are identical. Each one is rated as '10 W, 230 V'.

In which of the diagrams are all the bulbs working at their normal brightness?

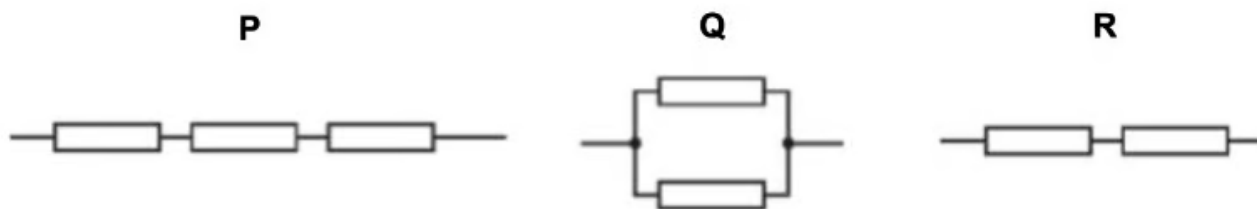


[1 mark]

### Question 7

A student connects together some identical resistors in three different combinations, as shown in the diagram.

Which of the answers below shows the correct order of the combinations from the lowest resistance to the highest?



- A.  $P \rightarrow Q \rightarrow R$
- B.  $Q \rightarrow P \rightarrow R$
- C.  $Q \rightarrow R \rightarrow P$
- D.  $P \rightarrow R \rightarrow Q$

[1 mark]

### Question 8

A teacher writes a set of notes about two **non-identical** bulbs which are connected in parallel.

He makes one mistake. Which of the statements below is incorrect?

- A. They have the same current flowing through them.
- B. They have the same potential difference across them.
- C. They can be switched on and off individually.
- D. If one bulb blows, the other will continue to work.

[1 mark]

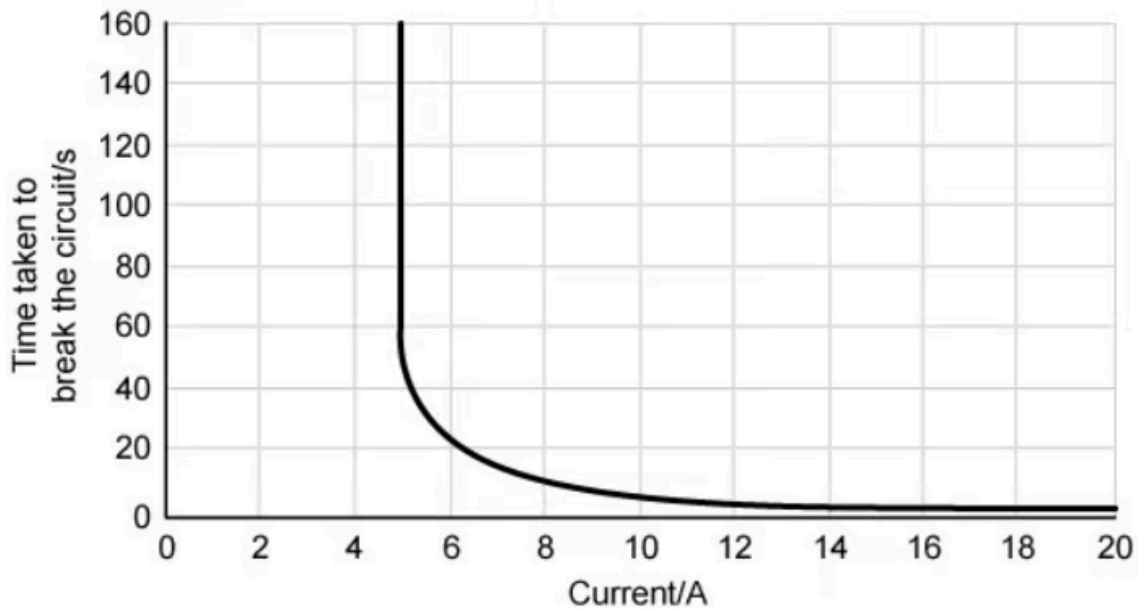


### Question 9

A person wants to install a circuit breaker to protect themselves and their lawnmower from too much current.

Under normal operating conditions, the lawnmower carries 4 A of current.

The manufacturer provides the graph below with the circuit breaker.



What will happen when the current is 4 A, and what will happen if the current rises to 14 A?

|   | 4 A                    | 14 A                   |
|---|------------------------|------------------------|
| A | circuit does not break | circuit does not break |
| B | circuit does not break | circuit breaks quickly |
| C | circuit breaks quickly | circuit does not break |
| D | circuit breaks quickly | circuit breaks quickly |

[1 mark]



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