The correct answer is **C** because:

- The resistors are connected in **series**.
- Therefore their total resistance is 5.0 + 10.0 = 15.0 Ω
- The current through all the components in the circuit will be the same since they are connected in series.
- To calculate the total circuit current, use $I = \frac{V}{R}$
- $I = \frac{10}{15} = 0.67\ \text{A}$

The other answers all contain common mistakes.

9

The correct answer is **D** because:

- The brightness of the bulb depends on the power it dissipates, $P = IV$, so any increase to the voltage or current in the part of the circuit containing the bulb (assuming the other does not change in the opposite direction) would increase its brightness.
- Resistances in parallel are smaller than the smallest resistor in the combination. Adding another resistor in parallel with the original resistor would decrease the overall resistance of the circuit, and would increase the brightness of the bulb.

A is incorrect as this would not change the voltage across either the bulb or the resistor, and would not change the current through them. It would, however, give another branch for current to flow down, draining the battery more quickly.

B is incorrect as this would decrease the resistance of the bulb/new resistor combo, increasing the total current in the circuit (but not the current through the bulb), and decreasing the voltage across the bulb. Remember that voltage splits according to resistance, so lowering the resistance also lowers the voltage across it. The bulb would get dimmer.

C is incorrect as this would **increase** the total resistance of the circuit, thus limiting the current and

The correct answer is **C** because:

- The resistors are connected in **series**.
- Therefore their total resistance is 5.0 + 10.0 = 15.0 Ω
- The current through all the components in the circuit will be the same since they are connected in series.
- To calculate the total circuit current, use $I = \frac{V}{R}$
- $I = \frac{10}{15} = 0.67\ \text{A}$

The other answers all contain common mistakes.

9

The correct answer is **D** because:

- The brightness of the bulb depends on the power it dissipates, $P = IV$, so any increase to the voltage or current in the part of the circuit containing the bulb (assuming the other does not change in the opposite direction) would increase its brightness.
- Resistances in parallel are smaller than the smallest resistor in the combination. Adding another resistor in parallel with the original resistor would decrease the overall resistance of the circuit, and would increase the brightness of the bulb.

A is incorrect as this would not change the voltage across either the bulb or the resistor, and would not change the current through them. It would, however, give another branch for current to flow down, draining the battery more quickly.

B is incorrect as this would decrease the resistance of the bulb/new resistor combo, increasing the total current in the circuit (but not the current through the bulb), and decreasing the voltage across the bulb. Remember that voltage splits according to resistance, so lowering the resistance also lowers the voltage across it. The bulb would get dimmer.

C is incorrect as this would **increase** the total resistance of the circuit, thus limiting the current and

The correct answer is **C** because:

- The resistors are connected in **series**.
- Therefore their total resistance is 5.0 + 10.0 = 15.0 Ω
- The current through all the components in the circuit will be the same since they are connected in series.
- To calculate the total circuit current, use $I = \frac{V}{R}$
- $I = \frac{10}{15} = 0.67\ \text{A}$

The other answers all contain common mistakes.

9

The correct answer is **D** because:

- The brightness of the bulb depends on the power it dissipates, $P = IV$, so any increase to the voltage or current in the part of the circuit containing the bulb (assuming the other does not change in the opposite direction) would increase its brightness.
- Resistances in parallel are smaller than the smallest resistor in the combination. Adding another resistor in parallel with the original resistor would decrease the overall resistance of the circuit, and would increase the brightness of the bulb.

A is incorrect as this would not change the voltage across either the bulb or the resistor, and would not change the current through them. It would, however, give another branch for current to flow down, draining the battery more quickly.

B is incorrect as this would decrease the resistance of the bulb/new resistor combo, increasing the total current in the circuit (but not the current through the bulb), and decreasing the voltage across the bulb. Remember that voltage splits according to resistance, so lowering the resistance also lowers the voltage across it. The bulb would get dimmer.

C is incorrect as this would **increase** the total resistance of the circuit, thus limiting the current and

Missing a Subject