

1 What is the function of a relay?

- A to allow a current in one circuit to operate a switch in another circuit
- B to prevent an electric shock by earthing a metal case
- C to protect a circuit by melting if the current becomes too large
- D to transform a d.c. voltage to a different value

2 A domestic circuit includes a 30 A fuse. This protects the wiring if there is too much current in the circuit.

In which wire is the 30 A fuse positioned, and what does it do when it operates?

	position	operation
A	live wire	disconnects the circuit
B	live wire	reduces the current to 30 A
C	neutral wire	disconnects the circuit
D	neutral wire	reduces the current to 30 A

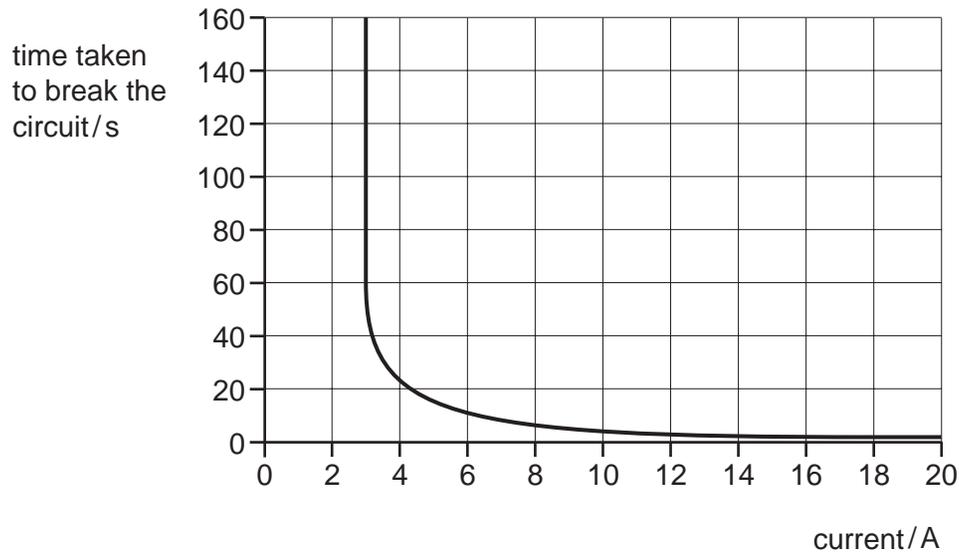
3 After some building work in a house, a bare (uninsulated) live wire is left protruding from a wall.

What is the greatest hazard?

- A a fire
- B a fuse blows
- C an electric shock
- D no current flows

- 4 A circuit-breaker is designed to protect a circuit which usually carries a current of 2 A.

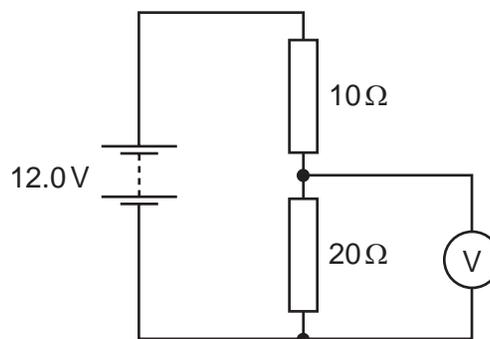
The time taken to break the circuit depends on the current, as shown in the graph.



What happens when the current in the circuit is 2 A and what happens when the current is 18 A?

	when the current is 2 A	when the current is 18 A
A	the circuit breaks in less than 5 seconds	the circuit breaks in less than 5 seconds
B	the circuit breaks in less than 5 seconds	the circuit does not break
C	the circuit does not break	the circuit breaks in less than 5 seconds
D	the circuit does not break	the circuit does not break

- 5 The diagram shows a $10\ \Omega$ resistor and a $20\ \Omega$ resistor connected in a potential divider circuit.

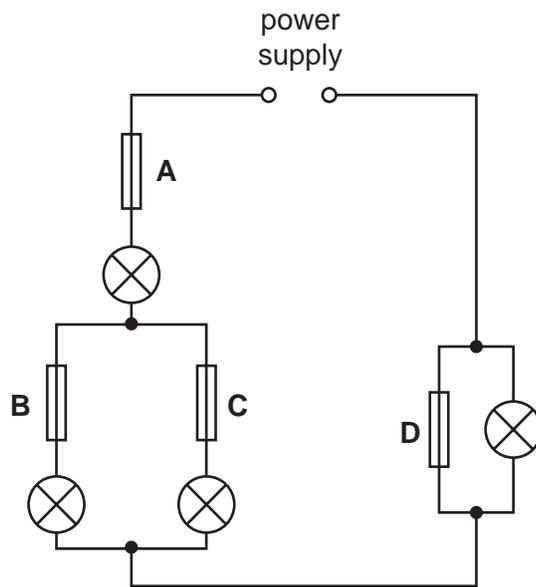


What is the reading on the voltmeter?

- A** 4.0V **B** 6.0V **C** 8.0V **D** 12.0V

6 In the circuit shown, only one of the fuses has blown, but none of the lamps is lit.

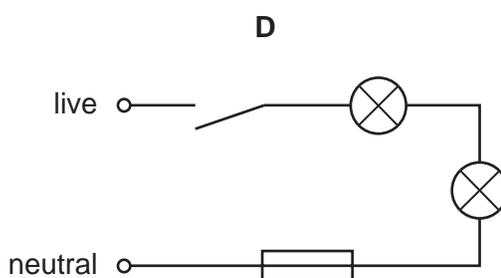
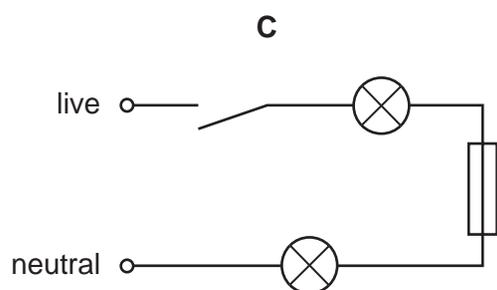
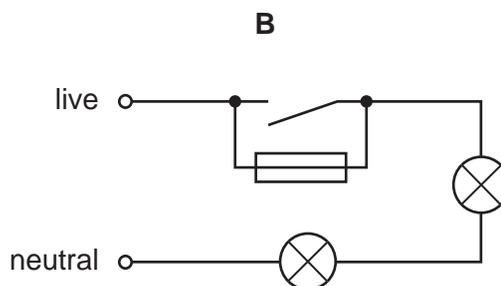
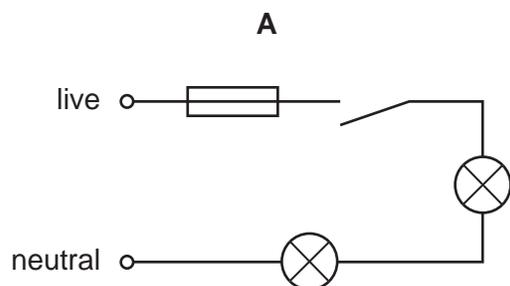
Which fuse has blown?



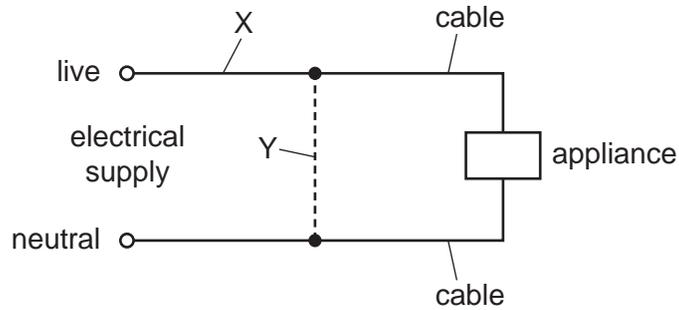
- 7 In an electrical circuit, what is the purpose of a fuse?
- A** to connect the metal case of an appliance to the earth
 - B** to cut off the electrical supply if the current is too large
 - C** to keep an electrical appliance dry in damp conditions
 - D** to maintain a steady voltage as the current varies

8 A fuse is used to protect an electric circuit.

Which diagram shows where the fuse should be connected?



- 9 Either a fuse or a circuit-breaker can be used to protect electrical cables from large currents that could cause overheating.

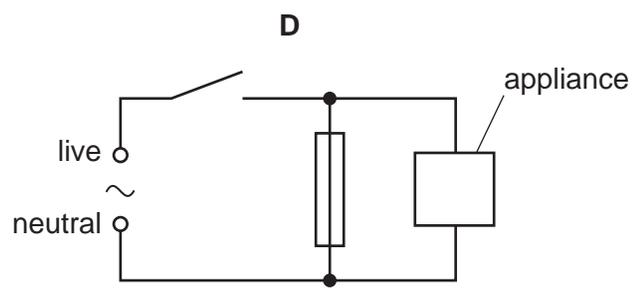
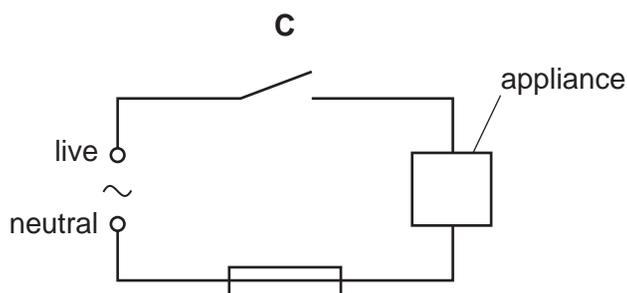
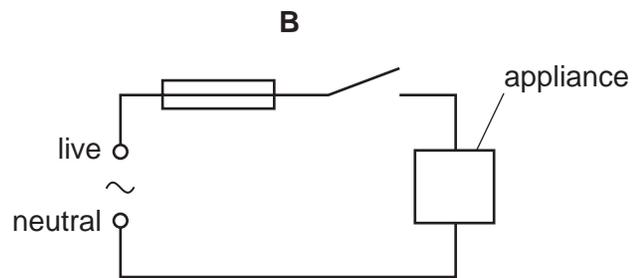
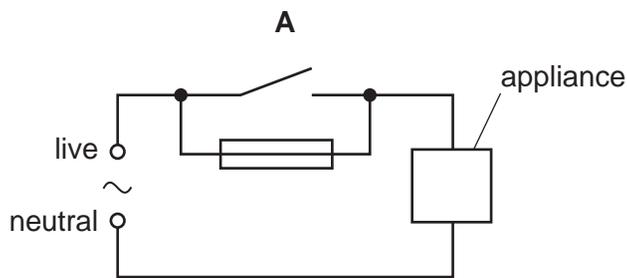


When a fuse is used, where should it be connected, and when a circuit-breaker is used, where should it be connected?

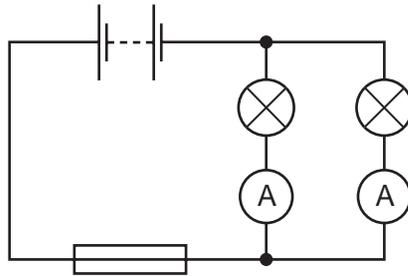
	position of fuse	position of circuit-breaker
A	X	X
B	X	Y
C	Y	X
D	Y	Y

- 10 An appliance is connected to a mains supply. Its circuit also contains a switch and a fuse.

Which circuit shows the fuse in the correct position?



- 11 In the circuit shown, the current from the battery divides equally between the two lamps. Each ammeter reads 6.0A.

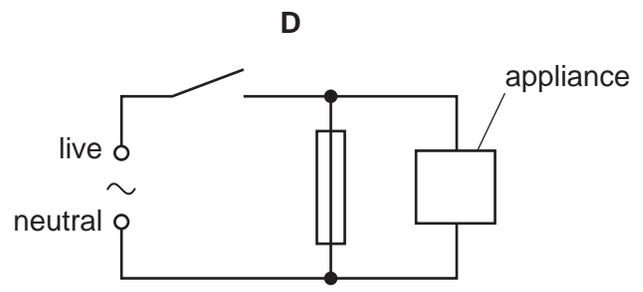
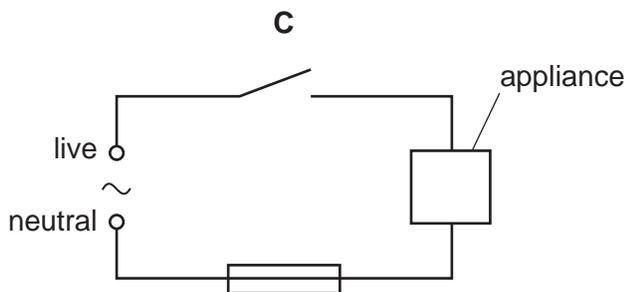
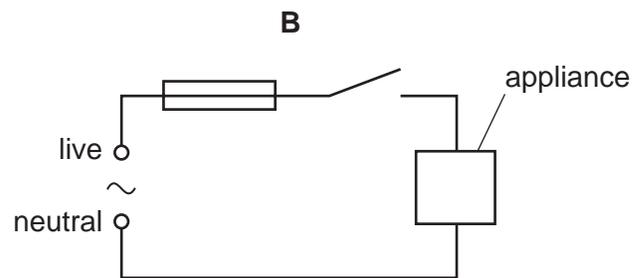
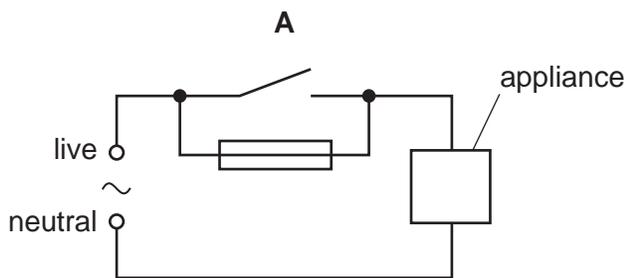


What is a suitable rating for the fuse in this circuit?

- A** 3.0A **B** 6.0A **C** 10.0A **D** 13.0A

- 12 An appliance is connected to a mains supply. Its circuit also contains a switch and a fuse.

Which circuit shows the fuse in the correct position?



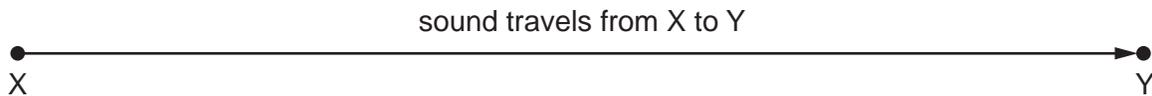
13 The current in a kettle is 10A and it is protected by a 13A fuse.

The owner of the kettle replaces the 13A fuse with a 3A fuse.

What happens when the kettle is switched on?

- A** The fuse blows and the kettle is damaged.
- B** The fuse blows and the kettle is undamaged.
- C** The fuse does not blow and the kettle works correctly.
- D** The fuse does not blow but the kettle fails to work.

14 In an experiment to measure the speed of sound, a student uses a stopwatch to find the time taken for a sound wave to travel from X to Y. She does this six times.



The table shows her results.

measurement	/s
first	0.5
second	0.7
third	0.6
fourth	0.4
fifth	0.9
sixth	0.5

Which value for the time should be used to calculate the speed of sound?

- A** 0.4s **B** 0.5s **C** 0.6s **D** 0.9s

15 A desk lamp should have a 3A fuse fitted, but a 13A fuse has been fitted by mistake.

The lamp is not faulty.

The lamp is switched on. What happens?

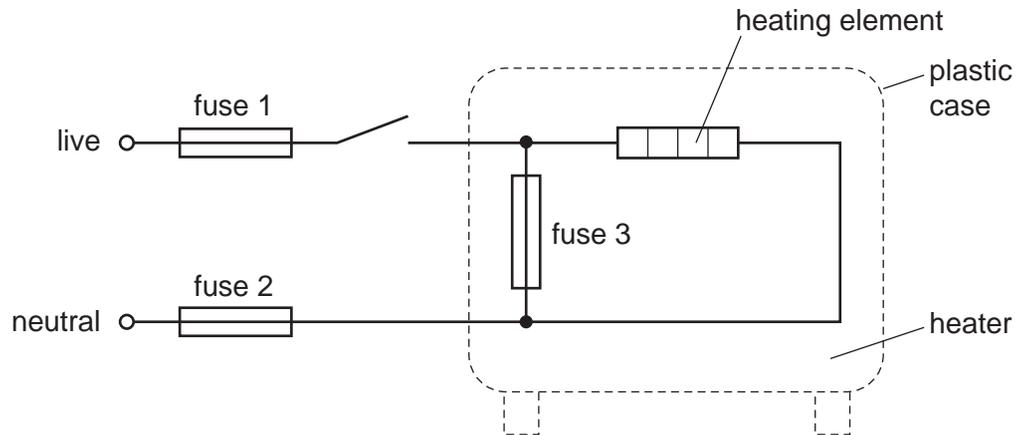
- A** The fuse blows.
- B** The fuse does not blow but the lamp does not light.
- C** The lamp draws too much current and the supply cables could melt.
- D** The lamp works normally.

16 Each branch of a domestic circuit often includes a circuit-breaker. This protects the wiring if too much current flows in the circuit.

In which wire is the circuit-breaker placed and what does it do when it operates?

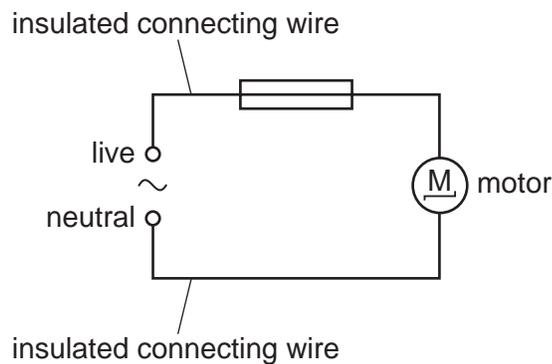
	circuit-breaker in	when the circuit-breaker operates it
A	live wire	disconnects the circuit
B	live wire	reduces the current to a safe value (not zero)
C	neutral wire	disconnects the circuit
D	neutral wire	reduces the current to a safe value (not zero)

- 17 The diagram shows the connections to an electric heater. Three fuses have been added to the circuit.



Which of the fuses are correctly placed?

- A** fuse 1, fuse 2 and fuse 3
 - B** fuse 1 and fuse 2 only
 - C** fuse 1 only
 - D** fuse 2 only
- 18 An electric motor is connected to the mains supply by insulated wires. The circuit is protected by a fuse, but the connecting wires become hot.

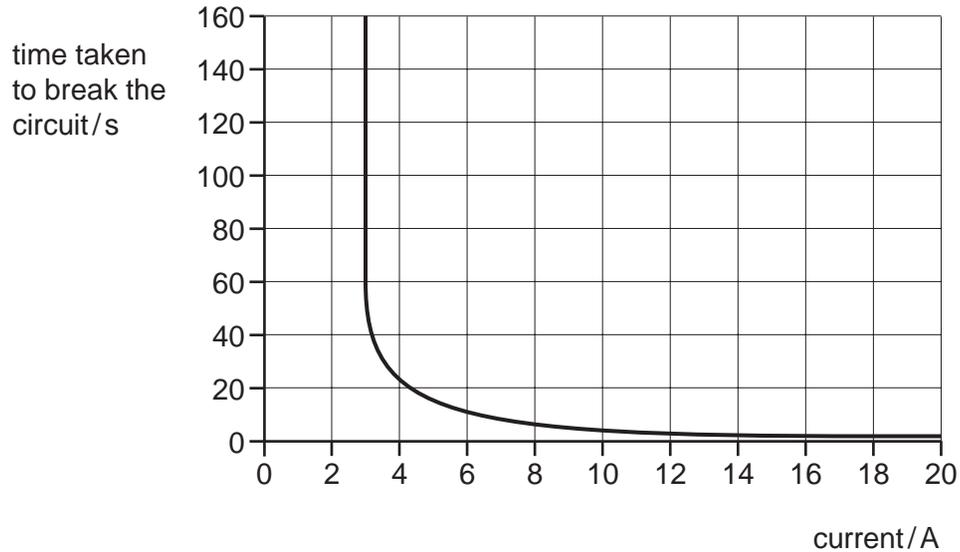


How could the wires be prevented from becoming so hot?

- A** Connect a second fuse in the neutral wire.
- B** Use a fuse with a higher current rating.
- C** Use thicker connecting wires.
- D** Use thicker insulation on the connecting wires.

19 A circuit-breaker is designed to protect a circuit which usually carries a current of 2 A.

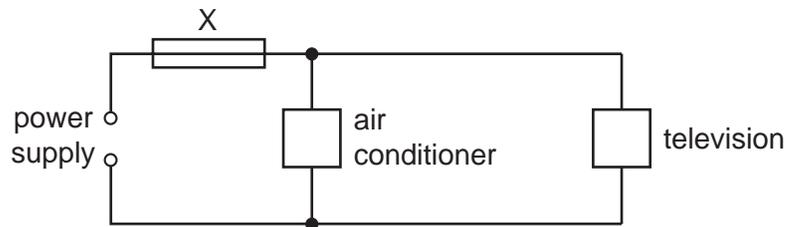
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20 An air conditioner and a television are both connected to the same electrical circuit.



The current in the air conditioner is 4.0 A and the current in the television is 6.0 A.

Several different fuses are available.

Which fuse should be connected at X?

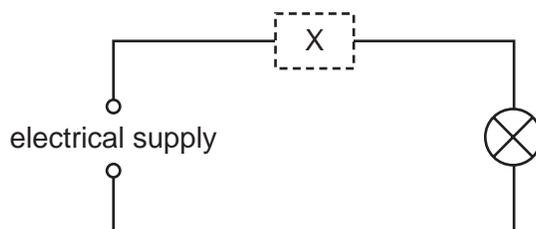
A 3 A

B 5 A

C 10 A

D 13 A

- 21 In this circuit, a component at X automatically protects the wiring from overheating if there is a fault.



Which components are suitable to use at X?

- A** a circuit-breaker, a fuse or a switch
 - B** only a circuit-breaker or a fuse
 - C** only a circuit-breaker or a switch
 - D** only a fuse
- 22 Which circuit includes a capacitor and what does the capacitor do in this circuit?

	circuit	what the capacitor does
A	potential divider	stores current
B	potential divider	stores energy
C	time delay	stores current
D	time delay	stores energy

- 23 A fuse and a relay each use an effect of an electric current.

Which effect of an electric current is used by a fuse and which effect is used by a relay?

	effect used by a fuse	effect used by a relay
A	heating effect	heating effect
B	heating effect	magnetic effect
C	magnetic effect	heating effect
D	magnetic effect	magnetic effect

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