4.5 Dangers of electricity

01. 0625_w21_qp_21 Q: 33

The metal cases of electrical appliances are connected to an earth wire.

Which statement is **not** correct?

A The live wire may become loose and touch the metal case.

B If the metal case becomes live, the earth wire conducts current to the ground.

C The earth wire needs to have a high resistance.

D Earthing metal cases helps prevent a person from receiving an electric shock.

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02. 0625_w21_qp_23 Q: 33

Circuit breakers and fuses are devices used to protect a circuit from overloading.

Which statement correctly describes the difference between a circuit breaker and a fuse?

A Circuit breakers can be reset if they operate but fuses need to be replaced.

B Circuit breakers need to be replaced if they operate but fuses can be reset.

C Circuit breakers can be used in an a.c. circuit but fuses cannot.

D Circuit breakers cannot be used in an a.c. circuit but fuses can.

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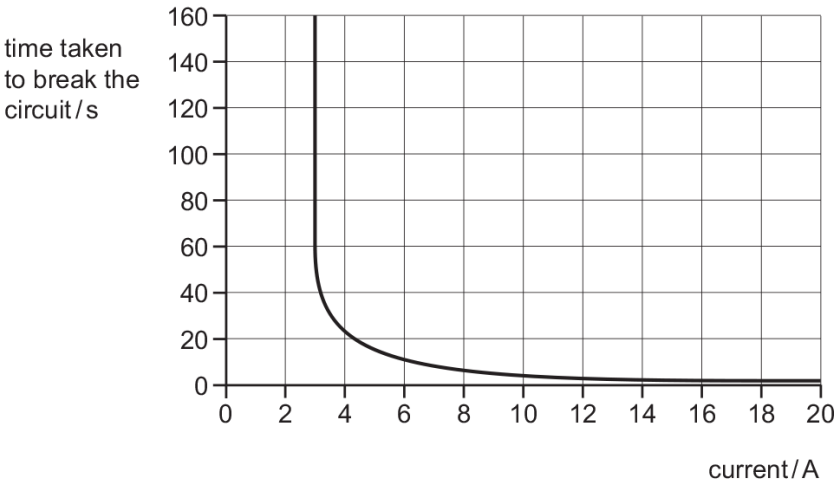
03. 0625_p20_qp_20 Q: 34

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

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04. 0625_m19_qp_22 Q: 35

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

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

What happens when the kettle is switched on?

A The fuse melts and the kettle might be damaged.

B The fuse melts and the kettle is undamaged.

C The fuse does not melt and the kettle works correctly.

D The fuse does not melt but the kettle fails to work.

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05. 0625_s19_qp_21 Q: 35

An electric heater is plugged into the mains supply using a fused plug.

The current in the heater is 10 A.

The cable attached to the heater is rated at 15 A.

The fuses available are rated at 1 A, 3 A, 5 A and 13 A.

Which fuse should be used?

A 1 A **B** 3 A **C** 5 A **D** 13 A

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06. 0625_s19_qp_22 Q: 35

Which components are designed to improve the safe working of a mains electrical supply?

	circuit breaker	earth wire	fuse
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✓
D	✓	✓	✓

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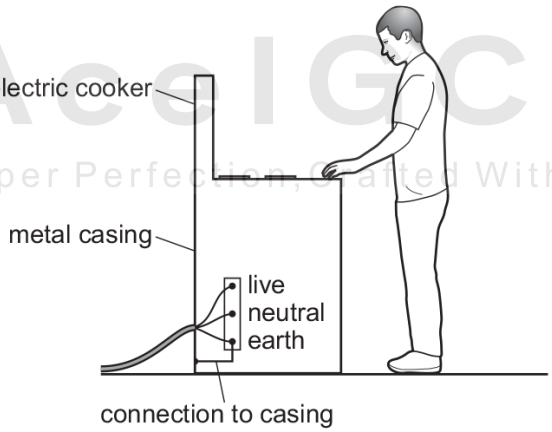
07. 0625_s19_qp_23 Q: 35

A simple wiring diagram for an electric cooker is shown.



Why is there a wire connecting the metal case of the cooker to earth?

A It improves the efficiency of the cooker.

B It prevents the metal case from becoming too hot when the cooker is left on.

C It reduces the risk of an electric shock if the live wire touches the metal case.

D The electric cooker will not switch on without it.

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08. 0625_w19_qp_21 Q: 33

Where must a fuse be connected in a mains electric circuit?

A the earth wire only

B the live wire only

C the neutral wire only

D the live wire and the earth wire

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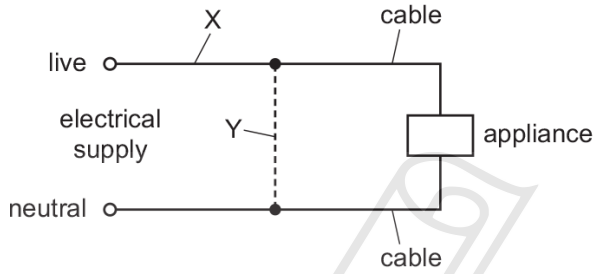
09. 0625_w18_qp_21 Q: 34

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

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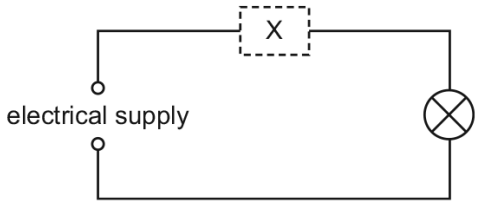
10. 0625_m17_qp_22 Q: 34

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



Which row indicates components that are suitable?

	circuit breaker	fuse	switch
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✗

key
✓ = suitable
✗ = not suitable

---

11. 0625_m16_qp_22 Q: 34

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

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12. 0625_w16_qp_21 Q: 35

Why is a fuse used in an electrical circuit?

A so that the current can have only one value

B to prevent the current becoming too large

C to provide a path to earth if a fault occurs

D to save electrical energy

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13. 0625_w16_qp_22 Q: 35

An electric kettle has a metal casing. The cable for the kettle contains a wire that is connected to the earth pin of the plug.

Which danger does this guard against?

A the cable to the kettle becoming too hot

B the casing of the kettle becoming live

C the casing of the kettle becoming wet on the outside

D the casing of the kettle overheating

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14. 0625_w16_qp_23 Q: 35

Two electrical appliances are connected to the mains supply.

The cable connected to one appliance includes an earth wire.

The cable connected to the second appliance does **not** need an earth wire.

What is a reason for this difference?

A One appliance has a metal case, but the other appliance does not.

B One appliance is fitted with a fuse, but the other appliance is not.

C One appliance is fitted with a switch, but the other appliance is not.

D One appliance needs more current than the other appliance.

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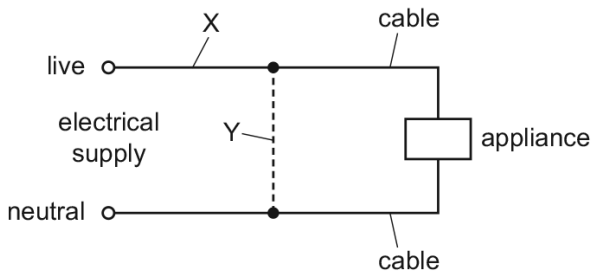
15. 0625_m15_qp_12 Q: 33

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

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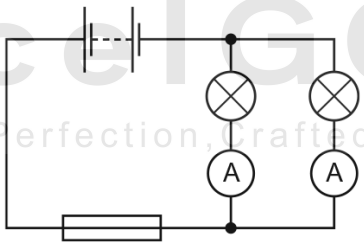
16. 0625_s14_qp_12 Q: 34

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



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

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

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17. 0625_w14_qp_11 Q: 33

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

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

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18. 0625_w14_qp_13 Q: 33

The current in an electrical heater is 5.0 A.

The heater is connected to the mains by a flexible cable that can carry a current of up to 15 A.
The mains circuit can carry a current of up to 30 A.

Different fuses are available for the heater.

Which fuse is the most suitable?

A 4.0 A **B** 10 A **C** 20 A **D** 40 A

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19. 0625_s13_qp_11 Q: 34

A desk lamp should have a 3 A fuse fitted, but a 13 A 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.

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20. 0625_s13_qp_12 Q: 34

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)

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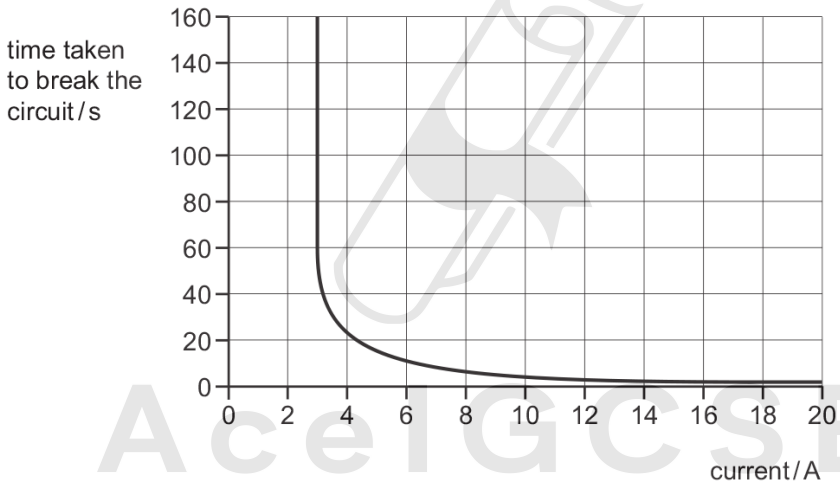
21. 0625_s12_qp_11 Q: 34

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 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

SN	Paper	Q. No.	Answer
01	0625_w21_qp_21	33	C
02	0625_w21_qp_23	33	A
03	0625_p20_qp_20	34	C
04	0625_m19_qp_22	35	B
05	0625_s19_qp_21	35	B
06	0625_s19_qp_22	35	D
07	0625_s19_qp_23	35	C
08	0625_w19_qp_21	33	B
09	0625_w18_qp_21	34	A
10	0625_m17_qp_22	34	B
11	0625_m16_qp_22	34	C
12	0625_w16_qp_21	35	B
13	0625_w16_qp_22	35	B
14	0625_w16_qp_23	35	A
15	0625_m15_qp_12	33	A
16	0625_s14_qp_12	34	D
17	0625_w14_qp_11	33	B
18	0625_w14_qp_13	33	B
19	0625_s13_qp_11	34	D
20	0625_s13_qp_12	34	A
21	0625_s12_qp_11	34	C