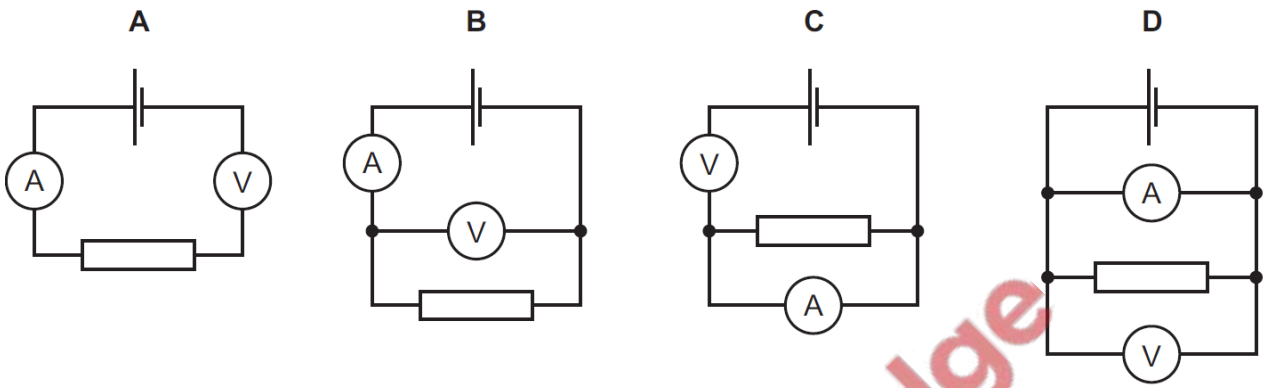
Electricity – 2019 June

1. 0625/11/M/J/19/No.31

A voltmeter and an ammeter are used to measure the resistance of a resistor.

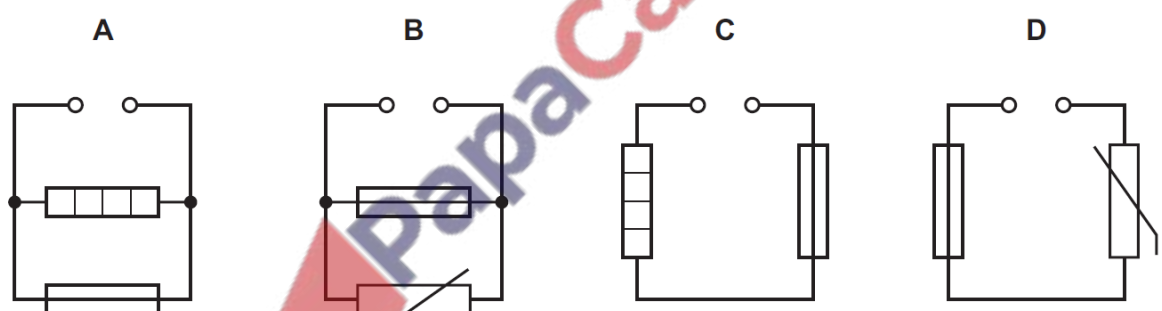
Which diagram shows the voltmeter and the ammeter correctly connected?



2. 0625/11/M/J/19/No.32

A student sets up four circuits.

In which circuit is there a heater in series with a fuse?



3. 0625/11/M/J/19/No.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.

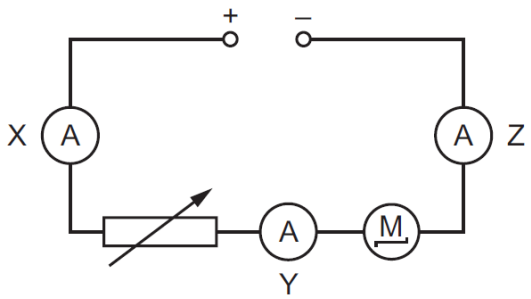
Which fuse should be used?

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

4. 0625/11/M/J/19/No.33

The diagram shows a circuit containing a d.c. power supply, a motor and a variable resistor.

Three ammeters X, Y and Z show the current in different parts of the circuit.



The reading on X is 4.0 A.

Which statement is correct?

A The readings on Y and Z are both less than 4.0 A.

B The readings on Y and Z are both equal to 4.0 A.

C The readings on Y and Z are both greater than 4.0 A.

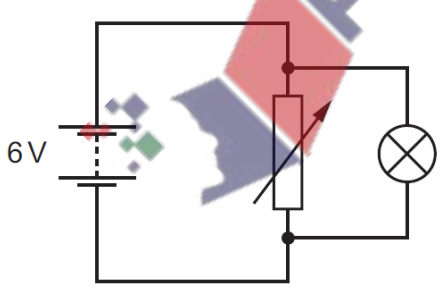
D The reading on Z is zero.

5. 0625/11/M/J/19/No.34

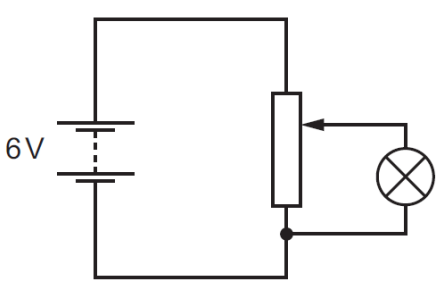
A lamp is to be connected in a circuit so that the potential difference (p.d.) across it can be varied from 0 to 6 V.

Which circuit would be most suitable?

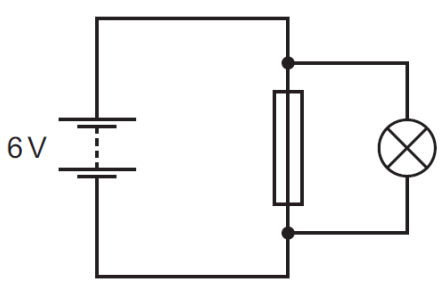
A



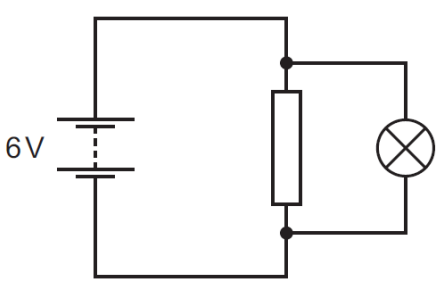
B



C



D

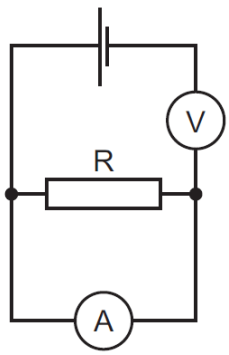


6. 0625/12/M/J/19/No.31

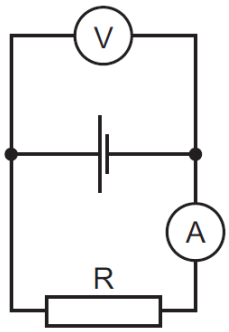
An ammeter and a voltmeter are used to determine the resistance of a resistor.

Which circuit diagram shows the ammeter and the voltmeter correctly connected?

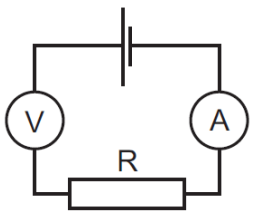
A



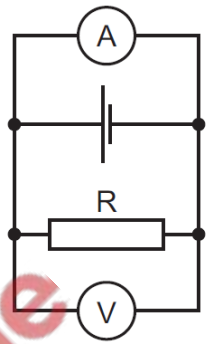
B



C

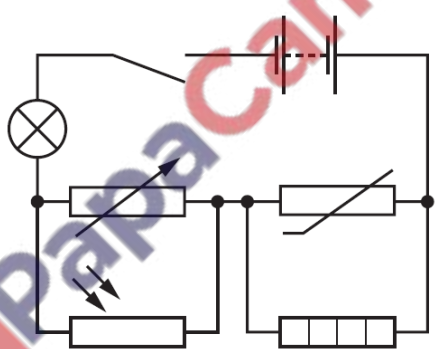


D



7. 0625/12/M/J/19/No.32

The diagram shows a circuit.



What is connected in parallel with the thermistor?

A heater

B lamp

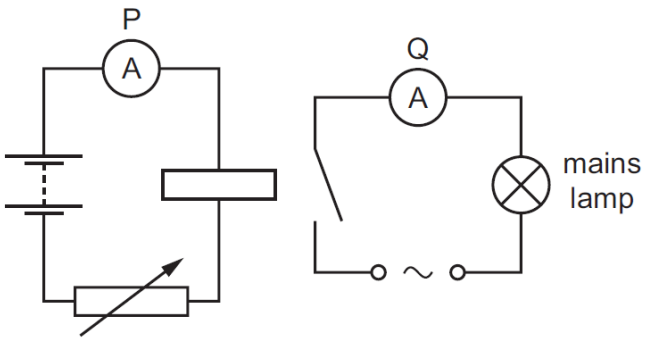
C light-dependent resistor

D variable resistor

8. 0625/12/M/J/19/No.33

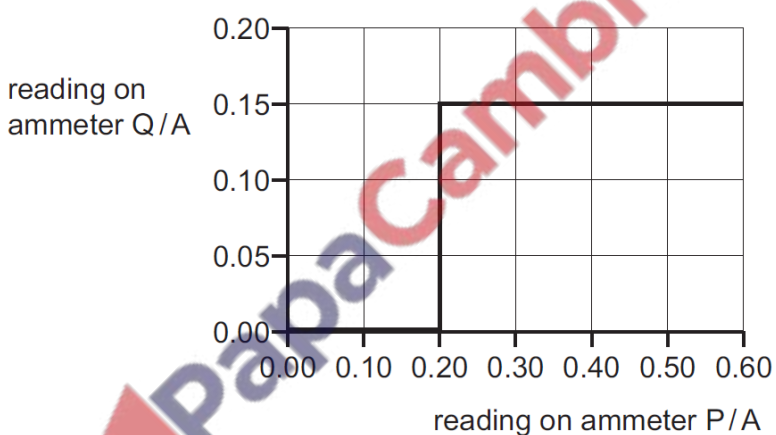
The circuit shows a relay being used to operate a mains lamp.

Two ammeters are labelled P and Q.



The variable resistor is used to vary the current in the relay coil. The mains lamp switches on when there is a large enough current in the relay coil.

The graph shows how the reading on ammeter Q changes as the reading on ammeter P increases.



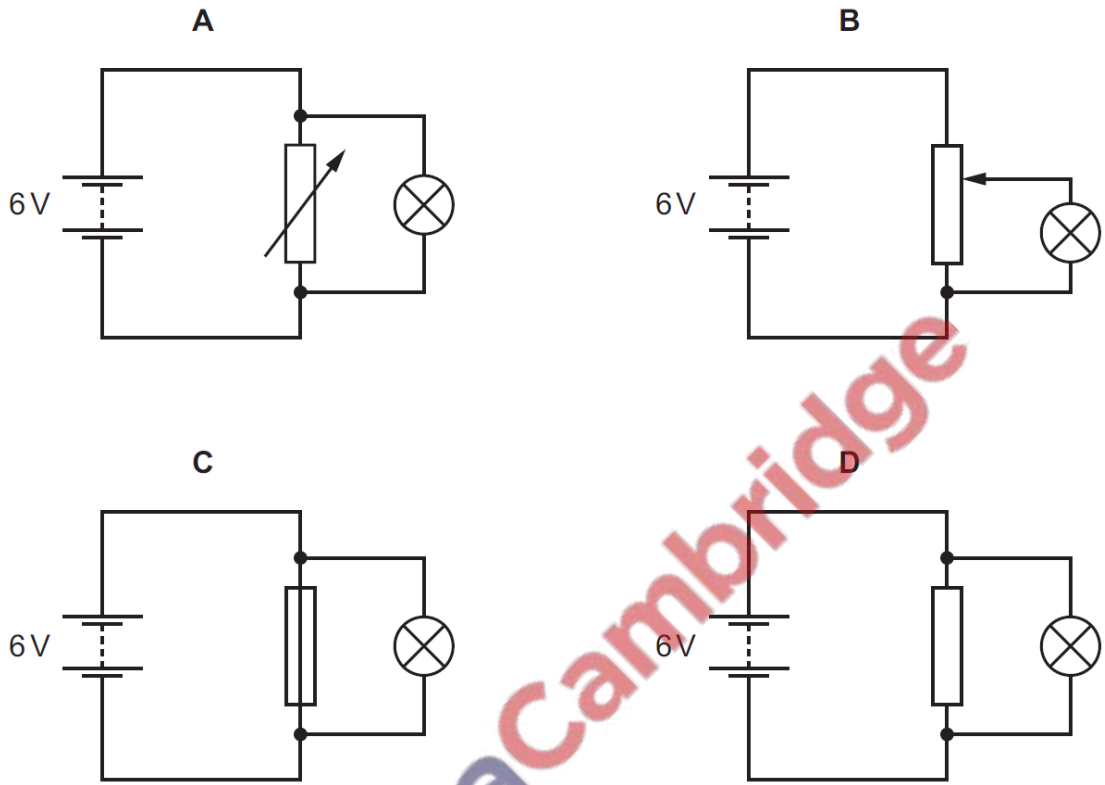
What is the minimum current needed in the relay coil to switch on the mains lamp?

A 0.15 A **B** 0.20 A **C** 0.35 A **D** 0.60 A

9. 0625/12/M/J/19/No.34

A lamp is to be connected in a circuit so that the potential difference (p.d.) across it can be varied from 0 to 6 V.

Which circuit would be most suitable?



10. 0625/12/M/J/19/No.35

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

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

11. 0625/13/M/J/19/No.31

A battery stores chemical potential energy. The battery is connected to a resistor.

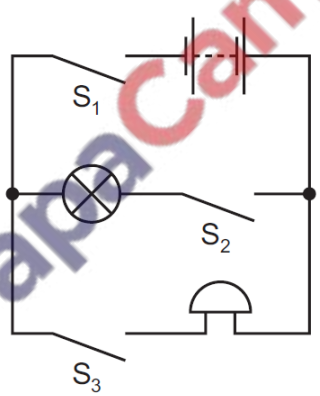
As the battery runs down, what happens to its chemical energy?

	The energy is transferred by	and ends up as
A	electrical working	internal energy in the resistor
B	electrical working	potential energy in the resistor
C	mechanical working	internal energy in the resistor
D	mechanical working	potential energy in the resistor

12. 0625/13/M/J/19/No.32

The diagram shows a circuit including a lamp, an electric bell and three switches S_1, S_2 and S_3.

The lamp and bell are not faulty.



The bell is ringing but the lamp is not lit.

Which switches are closed?

A S_1 only

B S_1 and S_2 only

C S_1 and S_3 only

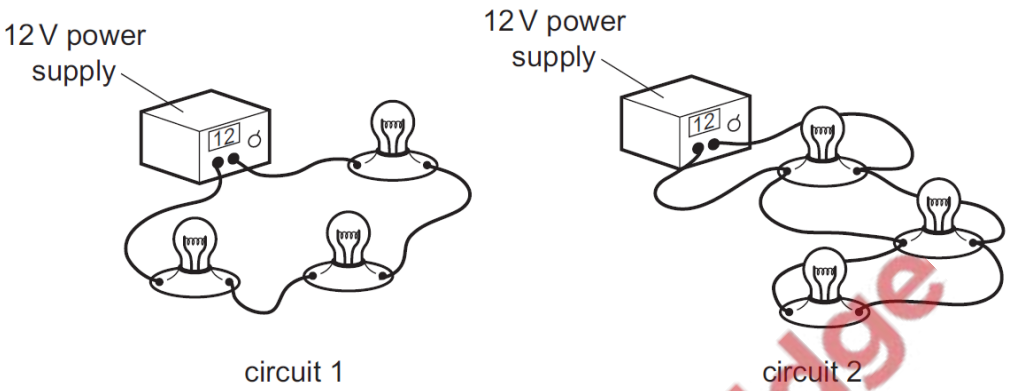
D S_1, S_2 and S_3

13. 0625/13/M/J/19/No.33

A student is designing a lighting circuit for a dolls' house. He sets up two different circuits.

Each circuit contains a 12 V power supply and three identical lamps.

Each lamp is designed to operate at normal brightness when connected individually to a 12 V supply.



circuit 1 circuit 2

Which statement is correct?

A In circuit 1, each of the lamps is at normal brightness.

B In circuit 1, if one lamp fails, the other lamps remain lit.

C In circuit 2, if one lamp fails, the other lamps remain lit.

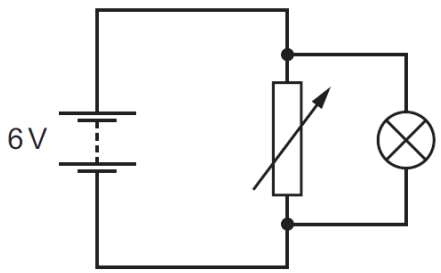
D In circuit 2, the current from the power supply is less than in circuit 1.

14. 0625/13/M/J/19/No.34

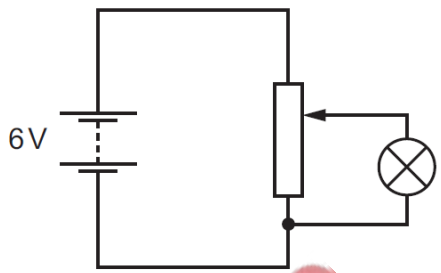
A lamp is to be connected in a circuit so that the potential difference (p.d.) across it can be varied from 0 to 6 V.

Which circuit would be most suitable?

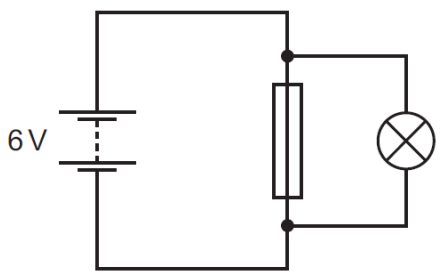
A



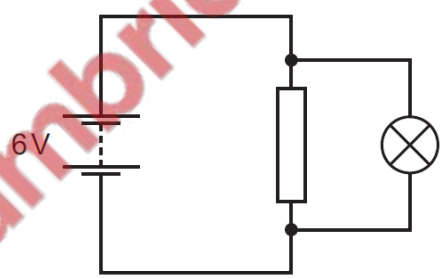
B



C

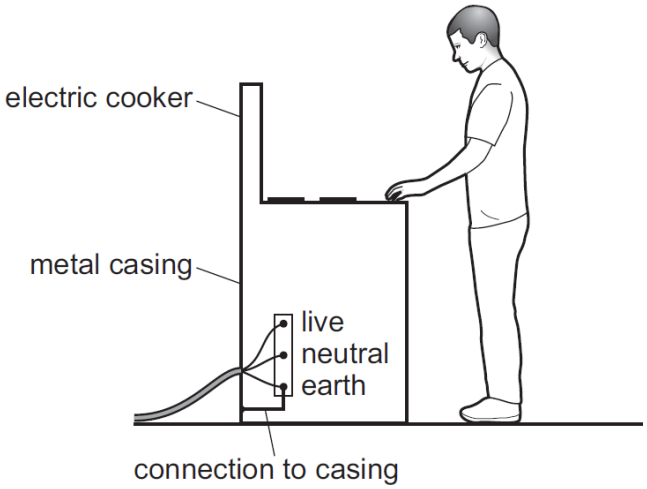


D



15. 0625/13,23/M/J/19/No.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.

16. 0625/21,22,23/M/J/19/No.28

A cell has an electromotive force (e.m.f.) of 1.5 V.

What does this statement mean?

A The cell converts 1.0 J of energy when driving 1.5 C of charge round a complete circuit.

B The cell converts 1.5 J of energy when driving 1.0 C of charge round a complete circuit.

C The cell converts 1.5 J of energy per second when driving 1.0 C of charge round a complete circuit.

D The cell converts 1.5 W of power when driving 1.0 C of charge round a complete circuit.

17. 0625/21/M/J/19/No.29

Which two changes to a metal wire both increase resistance?

A decreasing its length and increasing its temperature

B increasing its length and decreasing its temperature

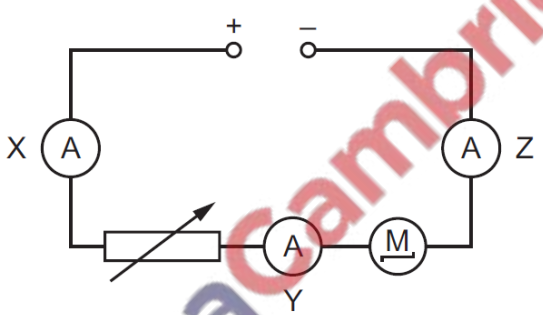
C decreasing its thickness and increasing its temperature

D increasing its thickness and decreasing its temperature

18. 0625/21/M/J/19/No.30

The diagram shows a circuit containing a d.c. power supply, a motor and a variable resistor.

Three ammeters X, Y and Z show the current in different parts of the circuit.



The reading on X is 4.0 A.

Which statement is correct?

A The readings on Y and Z are both less than 4.0 A.

B The readings on Y and Z are both equal to 4.0 A.

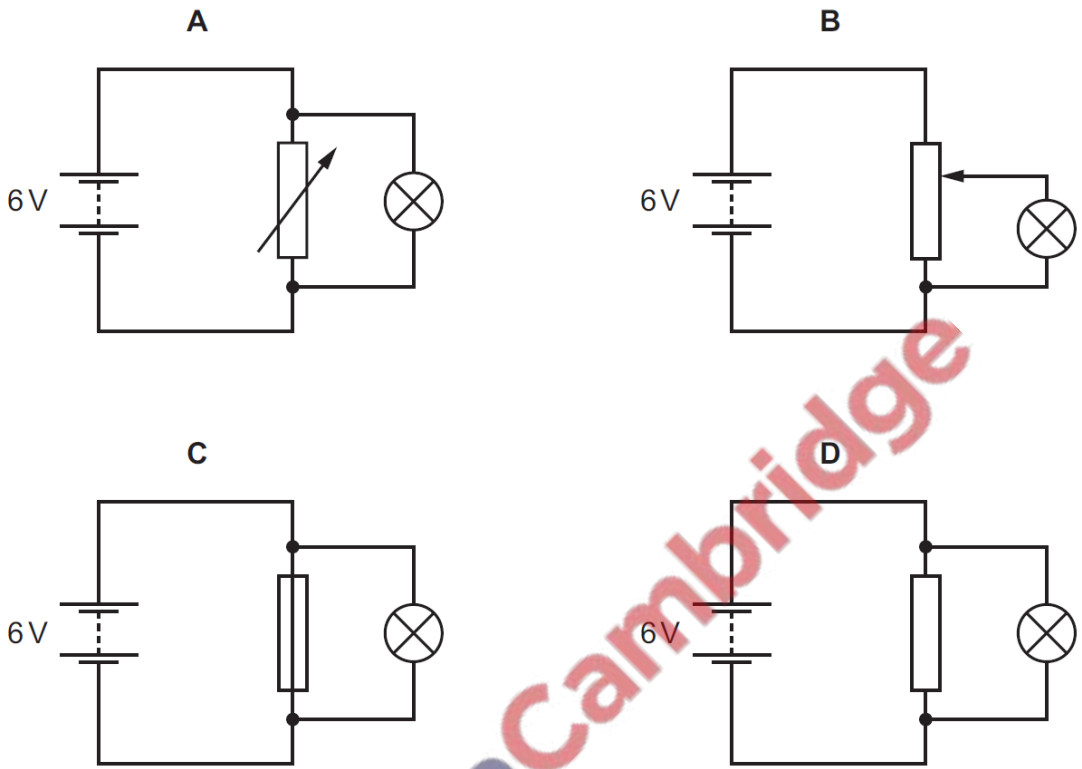
C The readings on Y and Z are both greater than 4.0 A.

D The reading on Z is zero.

19. 0625/21/M/J/19/No.31

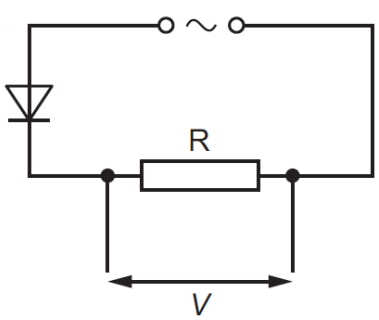
A lamp is to be connected in a circuit so that the potential difference (p.d.) across it can be varied from 0 to 6 V.

Which circuit would be most suitable?



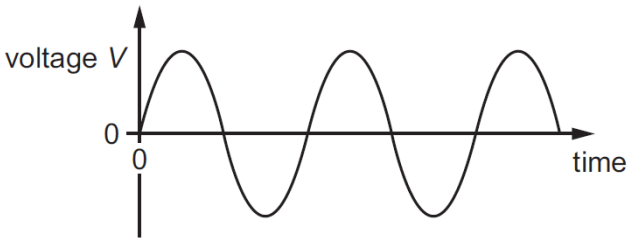
20. 0625/21/M/J/19/No.34

An alternating current (a.c.) power supply is connected in series with a resistor R and a diode.

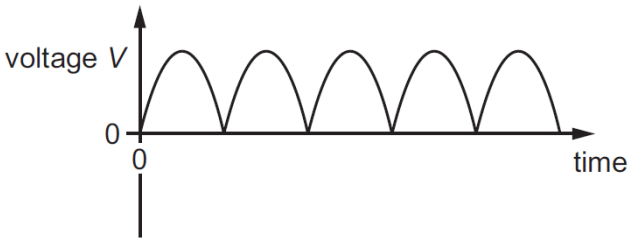


Which graph shows how the voltage *V* across the resistor R varies with time?

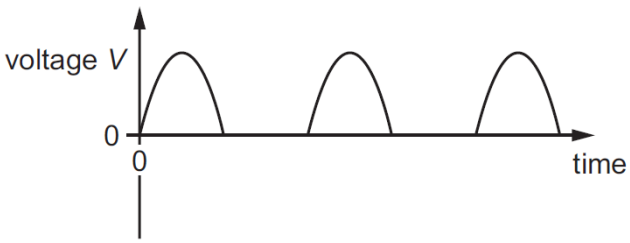
A



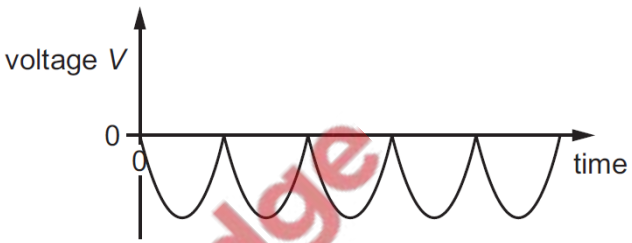
B



C



D



21. 0625/21/M/J/19/No.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

22. 0625/22/M/J/19/No.29

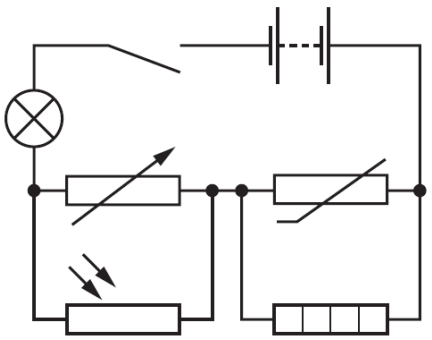
A metal wire of length 100 cm and cross-sectional area 0.20 mm^2 has a resistance of 8.0 Ω.

What is the resistance of a wire of the same metal of length 50 cm and cross-sectional area of 0.40 mm^2?

A 2.0 Ω **B** 8.0 Ω **C** 16 Ω **D** 32 Ω

23. 0625/22/M/J/19/No.30

The diagram shows a circuit.



What is connected in parallel with the thermistor?

A heater

B lamp

C light-dependent resistor

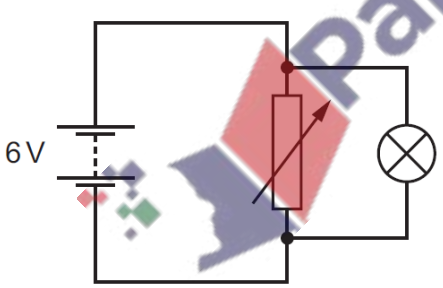
D variable resistor

24. 0625/22/M/J/19/No.31

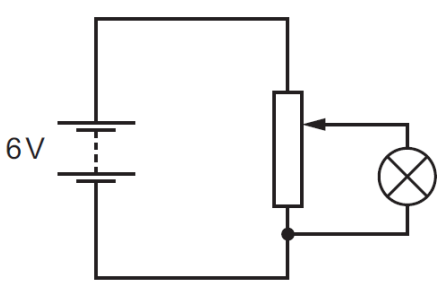
A lamp is to be connected in a circuit so that the potential difference (p.d.) across it can be varied from 0 to 6 V.

Which circuit would be most suitable?

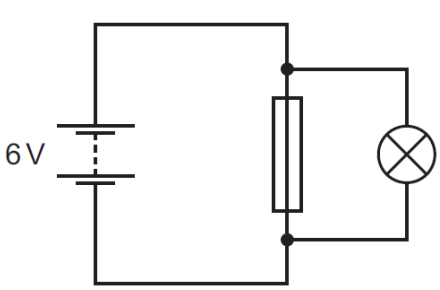
A



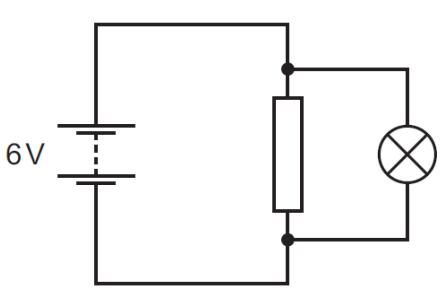
B



C

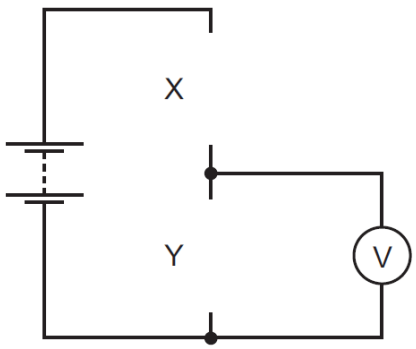


D



25. 0625/22/M/J/19/No.32

Components X and Y can be inserted to complete the circuit below. The completed circuit is a potential divider in which the potential difference across component Y increases when the temperature increases.



Which row shows the components X and Y?

	X	Y
A	light-dependent resistor	resistor
B	resistor	light-dependent resistor
C	resistor	thermistor
D	thermistor	resistor

26. 0625/22/M/J/19/No.35

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

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

27. 0625/23/M/J/19/No.29

Two wires X and Y are made from the same metal and have the same resistance.

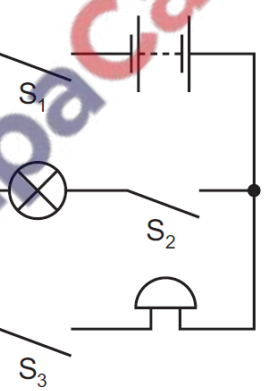
Which row identifies a possible pair of values for X and for Y?

	length of X / cm	diameter of X / mm	length of Y / cm	diameter of Y / mm
A	50	0.40	200	0.10
B	50	0.40	200	0.20
C	50	0.40	200	0.80
D	50	0.40	200	1.60

28. 0625/23/M/J/19/No.30

The diagram shows a circuit including a lamp, an electric bell and three switches S_1, S_2 and S_3.

The lamp and bell are not faulty.



The bell is ringing but the lamp is not lit.

Which switches are closed?

A S_1 only

B S_1 and S_2 only

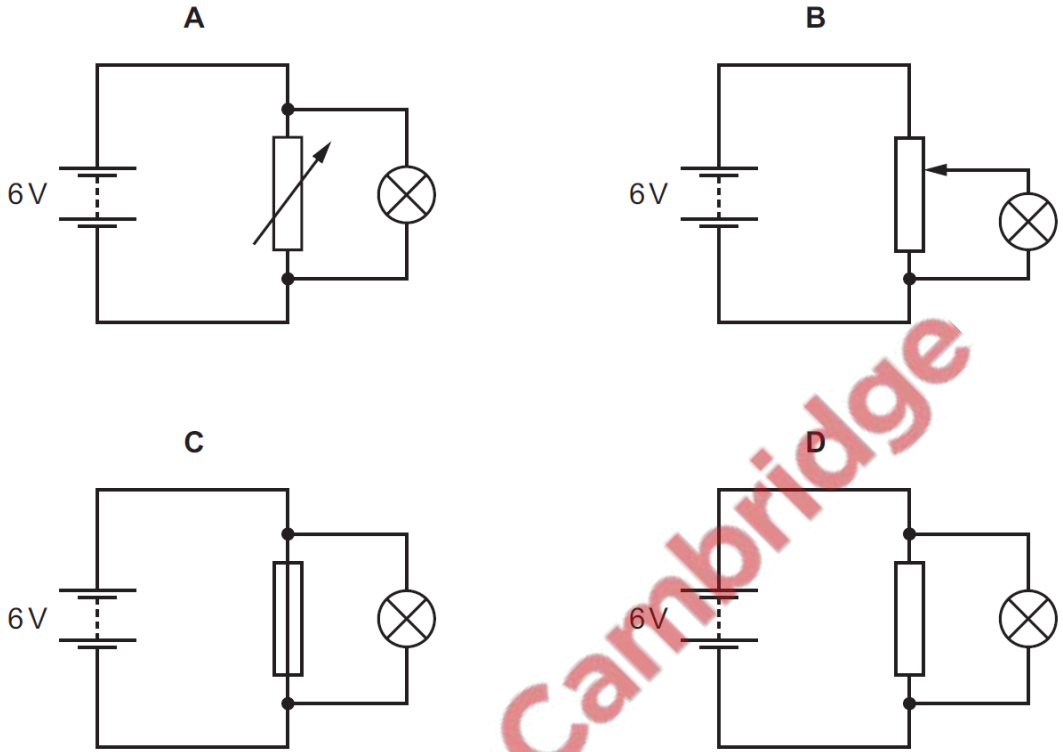
C S_1 and S_3 only

D S_1, S_2 and S_3

29. 0625/23/M/J/19/No.31

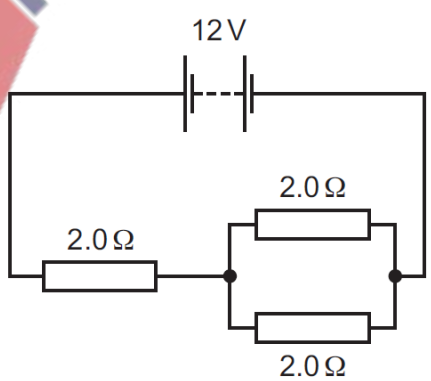
A lamp is to be connected in a circuit so that the potential difference (p.d.) across it can be varied from 0 to 6 V.

Which circuit would be most suitable?



30. 0625/23/M/J/19/No.32

A 12 V battery is connected to a combination of 2.0 Ω resistors as shown.



What is the current in the battery?

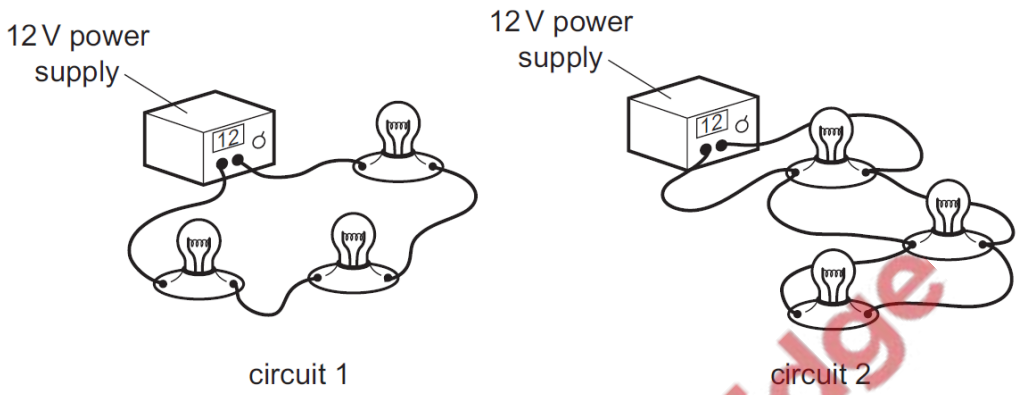
A 1.5 A **B** 2.0 A **C** 4.0 A **D** 6.0 A

31. 0625/23/M/J/19/No.33

A student is designing a lighting circuit for a dolls' house. He sets up two different circuits.

Each circuit contains a 12 V power supply and three identical lamps.

Each lamp is designed to operate at normal brightness when connected individually to a 12 V supply.



circuit 1 circuit 2

Which statement is correct?

A In circuit 1, each of the lamps is at normal brightness.

B In circuit 1, if one lamp fails, the other lamps remain lit.

C In circuit 2, if one lamp fails, the other lamps remain lit.

D In circuit 2, the current from the power supply is less than in circuit 1.

32. 0625/12/F/M/19/No.28

Which statement about a voltmeter is correct?

A A voltmeter measures the current in a component and is connected in series with the component.

B A voltmeter measures the current in a component and is connected in parallel with the component.

C A voltmeter measures the potential difference (p.d.) across a component and is connected in series with the component.

D A voltmeter measures the potential difference (p.d.) across a component and is connected in parallel with the component.

33. 0625/12/F/M/19/No.29

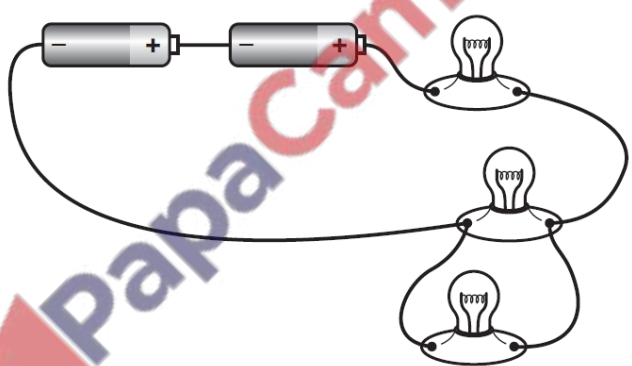
Four wires are made from the same metal.

Which wire has the lowest resistance?

	length of wire / cm	diameter of wire / mm
A	20	0.20
B	20	0.40
C	40	0.20
D	40	0.40

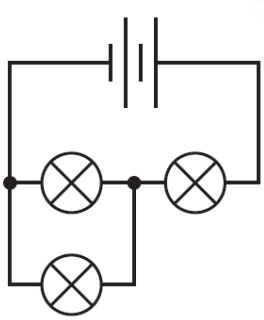
34. 0625/12, 22/F/M/19/No.30, 31

A student sets up a circuit containing a battery of two cells and three lamps, as shown.

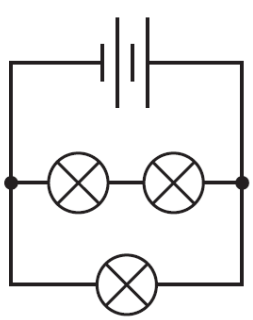


What is the circuit diagram for this arrangement?

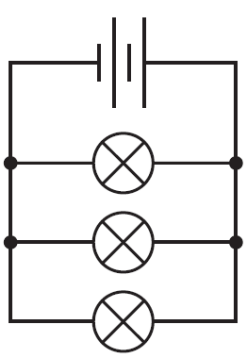
A



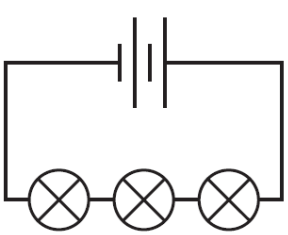
B



C



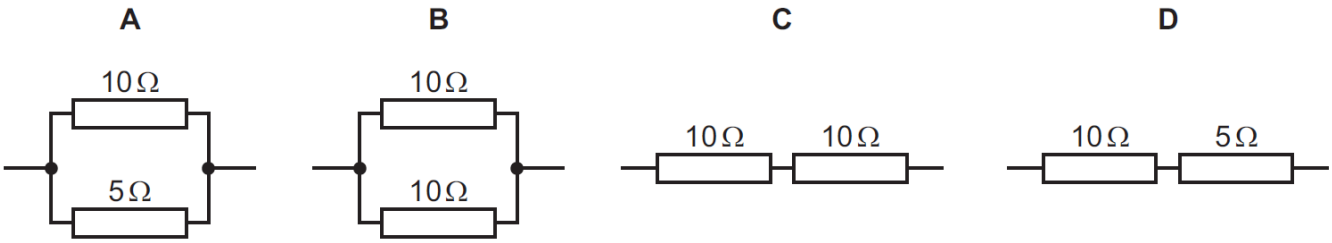
D



35. 0625/12/F/M/19/No.31

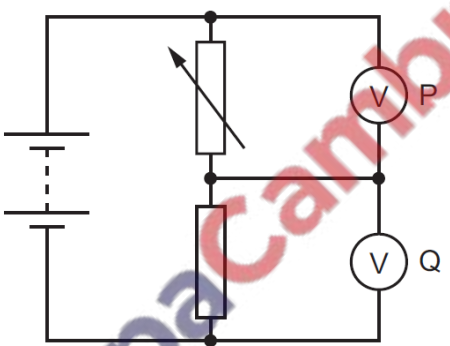
The diagrams show different resistor arrangements.

Which arrangement has the smallest combined resistance?



36. 0625/12/F/M/19/No.32

The diagram shows a potential divider circuit.



The resistance of the variable resistor is increased.

Which row shows what happens to the reading on voltmeter P and on voltmeter Q?

	reading on voltmeter P	reading on voltmeter Q
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

37. 0625/12/F/M/19/No.33

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.

38. 0625/22/F/M/19/No.30

Which electrical quantity is defined in terms of the energy supplied in driving charge round a complete circuit?

A current

B electromotive force

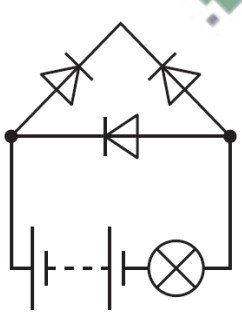
C potential difference

D power

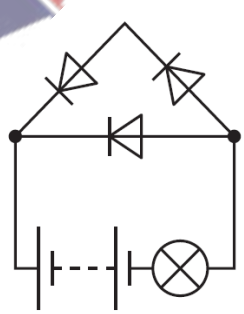
39. 0625/22/F/M/19/No.32

In which circuit does the lamp light?

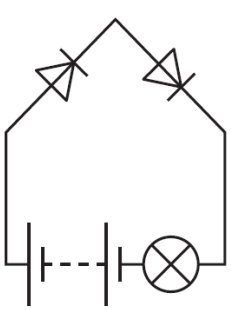
A



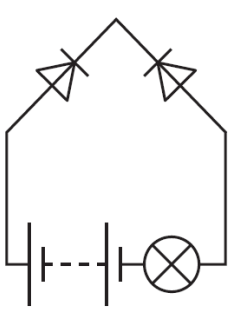
B



C



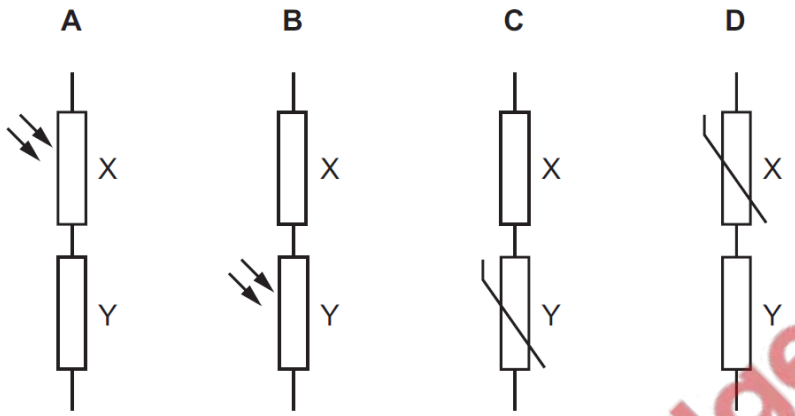
D



40. 0625/22/F/M/19/No.33

Each potential divider is placed in a circuit with a power supply.

Which potential divider makes the potential difference across component Y increase when the light intensity increases?



41. 0625/22/F/M/19/No.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.

42. 0625/22/F/M/19/No.36

Which statement about the direction of a magnetic field at a point is correct?

A It is the direction of the force on a north pole placed at that point.

B It is the direction of the force on a south pole placed at that point.

C It is the direction of the force on a positive charge placed at that point.

D It is the direction of the force on a negative charge placed at that point.