Electricity – 2022 June O Level 5054

1. June/2022/Paper_11/No.12

A 1000 W, 240 V electrical device is switched on.

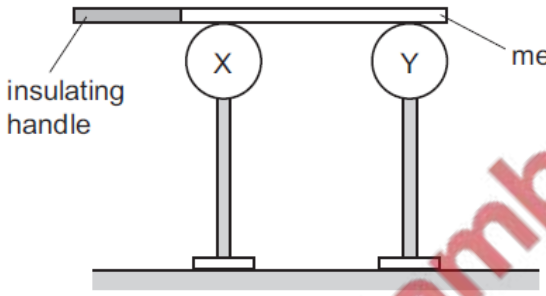
How much energy does it use in 5.0 minutes?

A 5000 J **B** 12 000 J **C** 72 000 J **D** 300 000 J

2. June/2022/Paper_11/No.28

Two metal spheres are mounted on insulating stands. Sphere X is initially uncharged and sphere Y is initially positively charged.

A metal rod, held by an insulating handle, is placed in contact with X and Y as shown.



What are the charges on X and on Y after the rod is placed in contact with them?

	charge on X	charge on Y
A	positive	positive
B	positive	uncharged
C	uncharged	positive
D	uncharged	uncharged

3. June/2022/Paper_11/No.29

Which device involves the use of static electrical charges?

A a computer hard disk drive

B a motor

C a photocopier

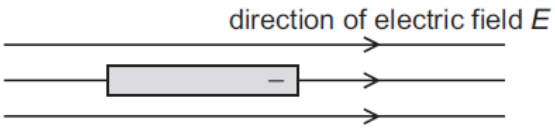
D a transformer

4. June/2022/Paper_11/No.30

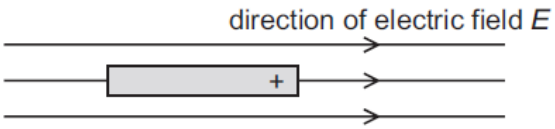
An initially uncharged copper rod is placed in a uniform electric field *E*. The rod is parallel to the field.

Which diagram shows the charges induced on the rod?

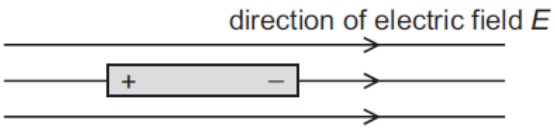
A



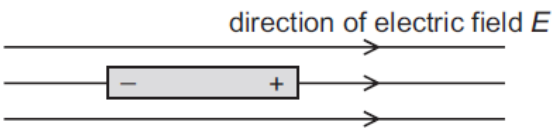
B



C

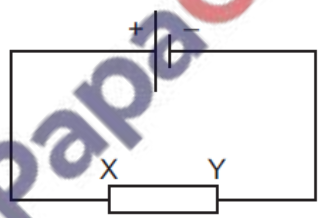


D



5. June/2022/Paper_11/No.31

The diagram shows a simple electric circuit.



Which row describes the charge on an electron and the direction of electron flow through the resistor?

	charge on an electron	direction of electron flow
A	negative	X to Y
B	negative	Y to X
C	positive	X to Y
D	positive	Y to X

6. June/2022/Paper_11/No.32

When the flash on a camera is used, a charge of 1.5 C flows for 0.0030 s through the flash lamp.

The average voltage across the flash lamp is 3600 V.

What is the electrical energy supplied to the flash lamp and what is the average power supplied?

	energy / J	power / W
A	2400	7.2
B	2400	800 000
C	5400	16.2
D	5400	1.8×10^6

7. June/2022/Paper_11/No.33

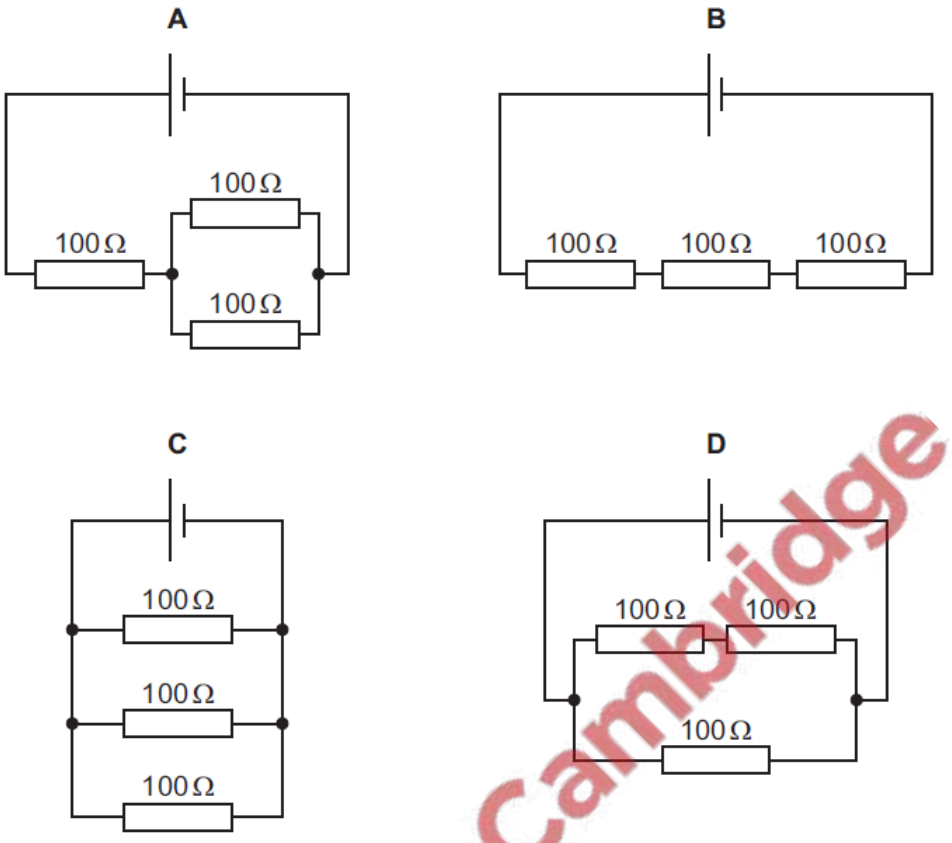
What is the unit of potential difference (p.d.) and which measuring instrument is used to measure p.d.?

	unit	instrument
A	ampere	ammeter
B	ampere	voltmeter
C	volt	ammeter
D	volt	voltmeter

8. June/2022/Paper_11/No.34

The diagrams show four circuits. Each circuit contains three 100 Ω resistors.

Which circuit has the smallest total resistance?



9. June/2022/Paper_11/No.35

A metal kettle is plugged into a mains socket. The plug contains a suitable fuse.

The kettle's cable is damaged and the fuse blows.

Why does the fuse blow?

A The bare earth wire in the cable touches the bare live wire.

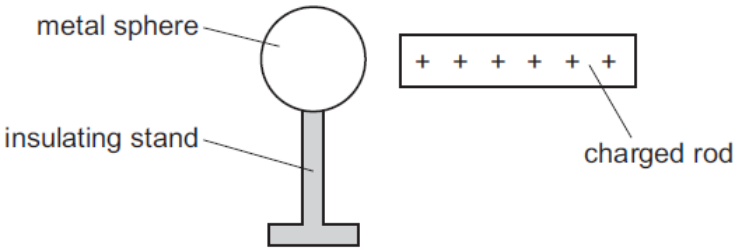
B The metal casing of the kettle touches the bare earth wire.

C The bare neutral wire in the cable touches the bare earth wire.

D The live wire breaks without touching any other wire.

10. June/2022/Paper_12/No.30

A positively charged rod is held near an uncharged metal sphere on an insulating stand.

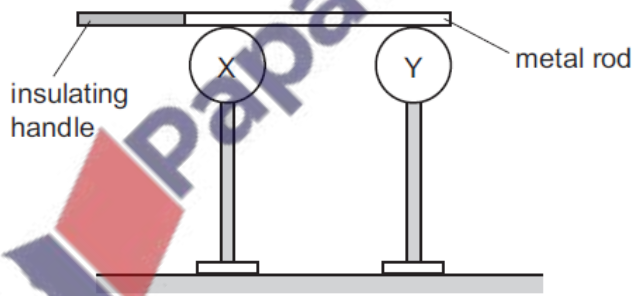


What is the distribution of charge on the sphere?

11. June/2022/Paper_12/No.31

Two metal spheres are mounted on insulating stands. Sphere X is initially uncharged and sphere Y is initially positively charged.

A metal rod, held by an insulating handle, is placed in contact with X and Y as shown.

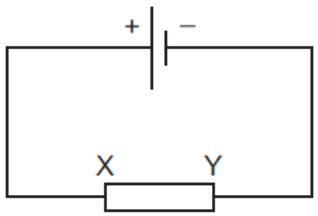


What are the charges on X and on Y after the rod is placed in contact with them?

	charge on X	charge on Y
A	positive	positive
B	positive	uncharged
C	uncharged	positive
D	uncharged	uncharged

12. June/2022/Paper_12/No.32

The diagram shows a simple electric circuit.



Which row describes the charge on an electron and the direction of electron flow through the resistor?

	charge on an electron	direction of electron flow
A	negative	X to Y
B	negative	Y to X
C	positive	X to Y
D	positive	Y to X

13. June/2022/Paper_12/No.33

Charge of 0.40 C passes through a resistor in 1.0 s.

In 2.0 s, 20 J of thermal energy is produced in the resistor.

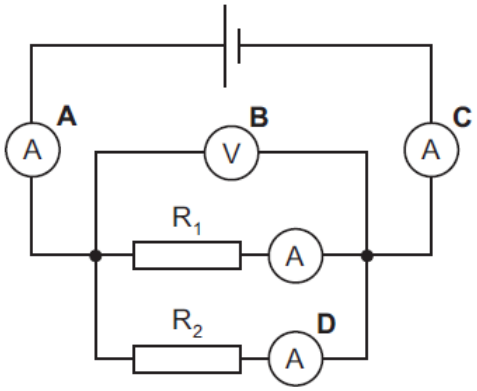
What is the potential difference across the resistor?

A 0.020 V **B** 0.040 V **C** 25 V **D** 50 V

14. June/2022/Paper_12/No.34

The diagram shows a simple electric circuit.

Which meter measures the current in resistor R_2?



15. June/2022/Paper_12/No.35

When the flash on a camera is used, a charge of 1.5 C flows for 0.0030 s through the flash lamp.

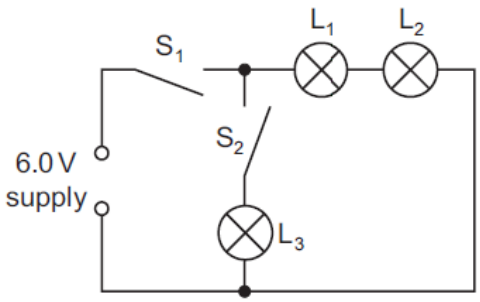
The average voltage across the flash lamp is 3600 V.

What is the electrical energy supplied to the flash lamp and what is the average power supplied?

	energy / J	power / W
A	2400	7.2
B	2400	800 000
C	5400	16.2
D	5400	1.8×10^6

16. June/2022/Paper_12/No.36

The diagram shows an electric circuit.



Which lamps light when switch S_1 is closed and S_2 is open?

A L_1 only

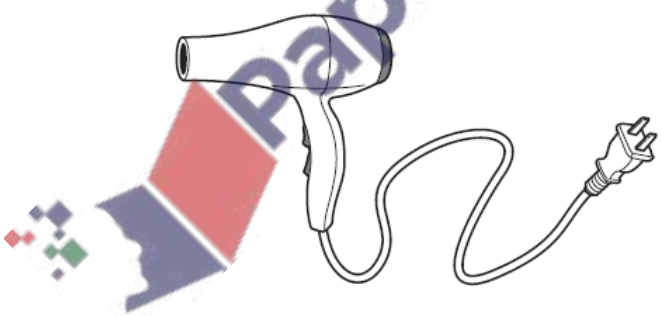
B L_3 only

C L_1 and L_2 only

D L_1, L_2 and L_3

17. June/2022/Paper_12/No.37

The diagram shows a hairdryer.



Which statement explains why the hairdryer does **not** need an earth wire?

A It has a live wire.

B It has a neutral wire.

C It has double insulation.

D The cable is insulated.

18. June/2022/Paper_21/No.6

(a) A light-dependent resistor (LDR) is used to sense the amount of light in a room.

Fig. 6.1 shows part of the circuit used. The LDR is not shown.

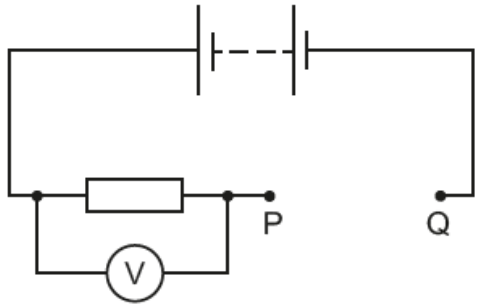


Fig. 6.1

(i) Complete Fig. 6.1 by drawing the circuit symbol for an LDR between points P and Q. [1]

(ii) Explain how the voltmeter reading changes as the amount of light falling on the LDR increases.

.....

.....

..... [2]

(b) Fig. 6.2 shows part of a circuit containing three resistors.

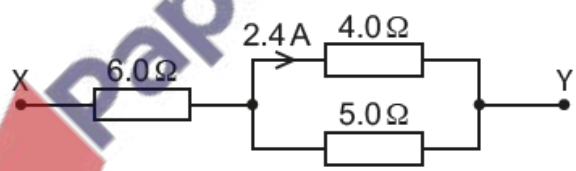


Fig. 6.2

The current in the 4.0 Ω resistor is 2.4 A.

(i) Show that the current in the 5.0 Ω resistor is 1.9 A.

[2]

(ii) Calculate the potential difference (p.d.) between points X and Y.

p.d. = ... [2]

[Total: 7]

19. June/2022/Paper_22/No.5

(a) A student connects a battery, thermistor X and resistor Y in parallel, as shown in Fig. 5.1.

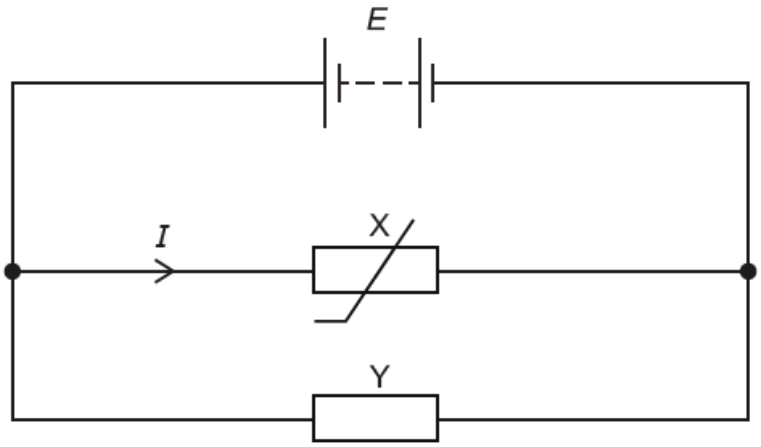


Fig. 5.1

- The electromotive force (e.m.f.) of the battery is E.
- The current in X is I.
- The resistance of Y is greater than the resistance of X.

Tick **two** boxes, one to show the correct statement about the potential difference across Y and the other to show the correct statement about the current in Y.

The potential difference across Y:

is less than E ☐

is equal to E ☐

is greater than E. ☐

The current in Y:

is less than I ☐

is equal to I ☐

is greater than I. ☐

[1]

(b) The student connects thermistor X in series with the resistor Y and a battery of e.m.f. 6.0 V, as shown in Fig. 5.2.

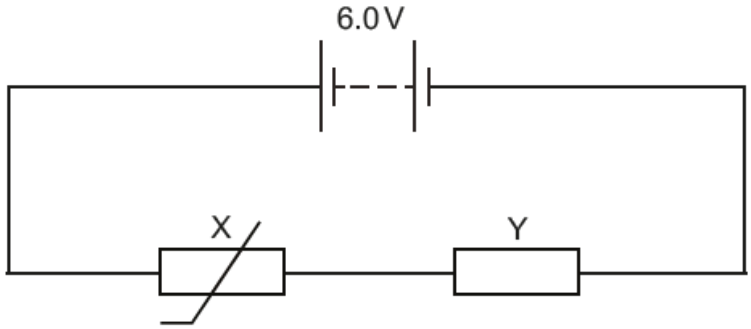


Fig. 5.2

In this circuit, at room temperature, the resistance of thermistor X is 600 Ω and the current in thermistor X is 0.0020 A.

(i) Calculate the power produced in the thermistor.

power = ... [2]

(ii) Calculate the resistance of Y.

resistance = ... [3]

(iii) The thermistor is cooled.

Explain why this causes the potential difference across Y to decrease.

.....

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..... [2]

[Total: 8]