Electrical Quantities

Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Electrical Quantities
Booklet	Question Paper 1

Time allowed: **23 minutes**

Score: **/18**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

What is an electric field?

A. a region around a wire carrying an electric current in which a compass needle experiences a force

B. a region in which an electric charge experiences a force

C. a region in which an electric charge is attracted by the Earth's gravity

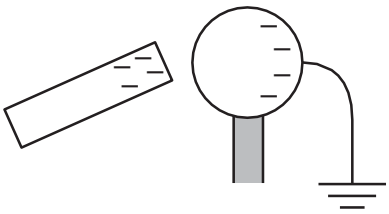
D. a region through which electromagnetic radiation is passing

Question 2

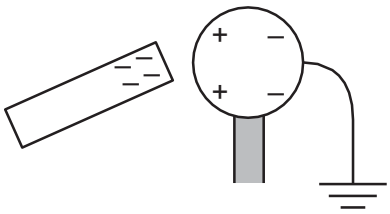
A negatively charged rod is held close to one side of a metal sphere. The other side of the sphere is earthed.

Which diagram shows the distribution of charge on the metal sphere?

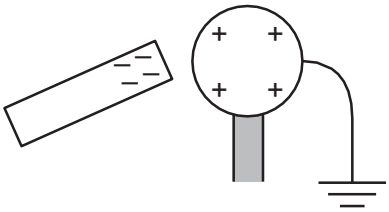
A



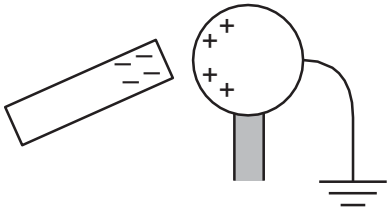
B



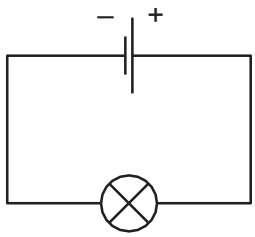
C



D



A cell is connected to a lamp, as shown.



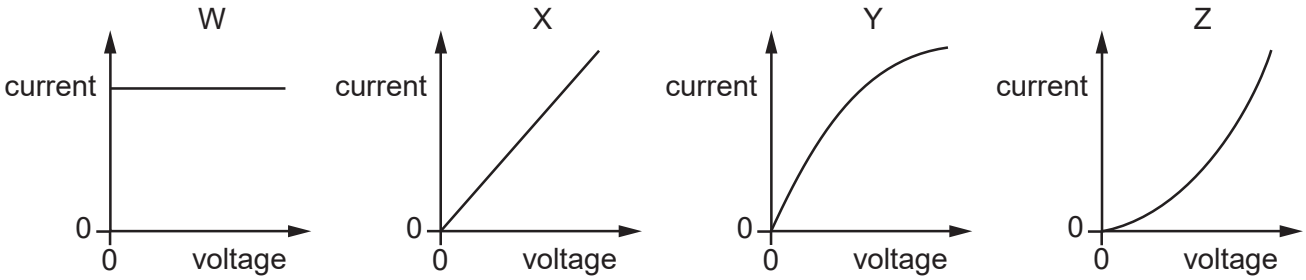
A charge of 4.0 C flows through the lamp in 2.0 s.

What is the direction of the electron flow in the lamp and what is the current in the lamp?

	direction of electron flow in lamp	current / A
A	from left to right	2.0
B	from left to right	8.0
C	from right to left	2.0
D	from right to left	8.0

The diagrams show four current-voltage graphs.

Which two graphs show the characteristics of an ohmic resistor and of a filament lamp?

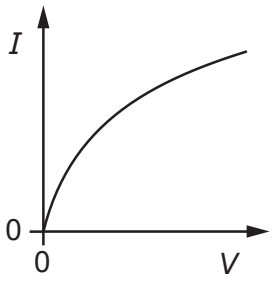


	ohmic resistor	filament lamp
A	W	Y
B	X	Y
C	W	Z
D	X	Z

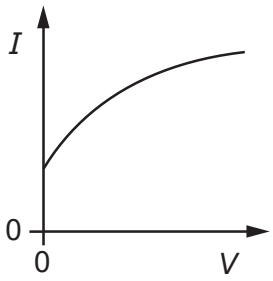
A small potential difference V is applied across a filament lamp. The current I in the lamp is measured. V is increased in stages and I is measured at each stage.

Which graph shows the results obtained?

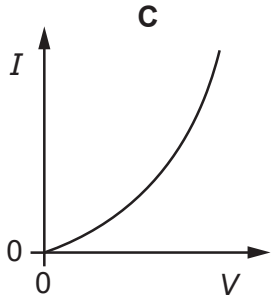
A



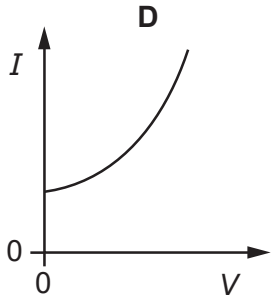
B



C



D



A resistor of resistance R is connected to a battery of e.m.f. V.

There is a current I in the resistor.

Power P is dissipated by the resistor, and in time t the energy transferred is E.

Which expression is correct?

A $E = IVt$ B $E = PIt$ C $P = VIR$ D $P = \frac{V}{R}$

A wire has a certain electrical resistance.

The diameter and length of the wire may be changed.

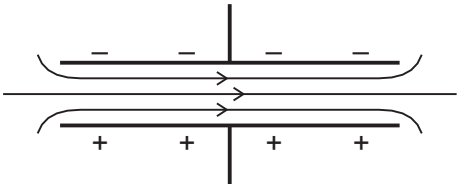
Which pair of changes must cause the resistance of the wire to increase?

	change of diameter	change of length
A	decrease	decrease
B	decrease	increase
C	increase	decrease
D	increase	increase

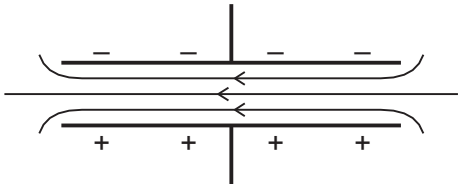
Each diagram shows two charged metal plates.

Which diagram shows the pattern and the direction of the electric field between the plates?

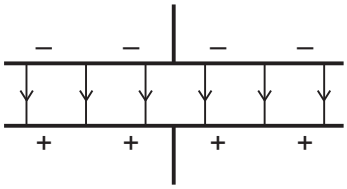
A



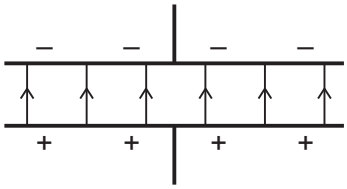
B



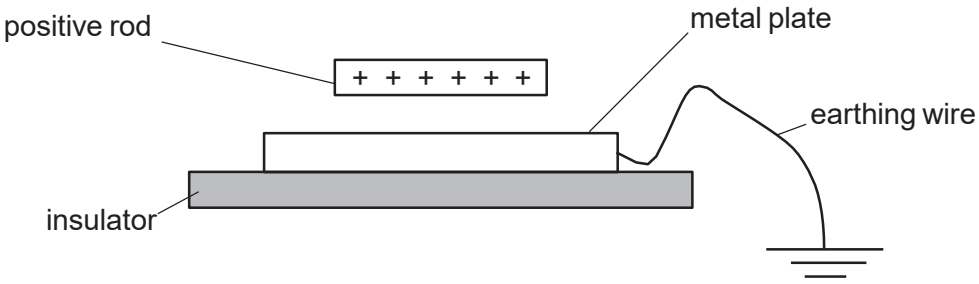
C



D



A positively charged plastic rod is placed just above a thick metal plate. The metal plate rests on an insulator and is connected to the earth by a wire.



A student disconnects the earthing wire and then removes the positively charged rod.

The experiment is repeated. This time the student removes the positively charged rod and then removes the earthing wire.

Which statement is correct?

A When the earthing wire is disconnected first, the metal plate becomes positively charged.

B When the earthing wire is disconnected first, the metal plate becomes negatively charged.

C When the plastic rod is removed first, the metal plate becomes positively charged.

D When the plastic rod is removed first, the metal plate becomes negatively charged.

The resistance of a wire depends on its length l and on its cross-sectional area A.

The resistance is

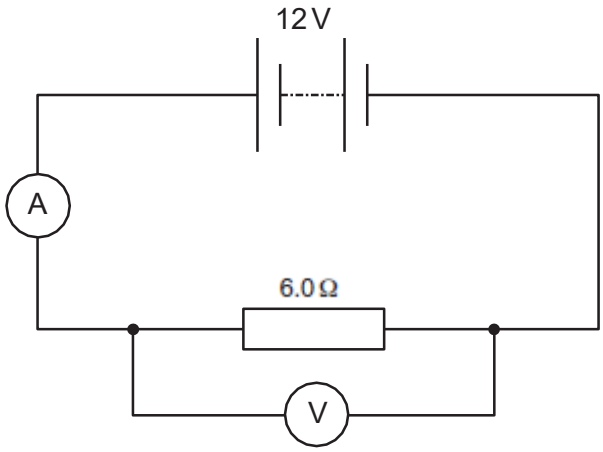
A directly proportional to l and directly proportional to A.

B directly proportional to l and inversely proportional to A.

C inversely proportional to l and directly proportional to A.

D inversely proportional to l and inversely proportional to A.

In the circuit shown, the ammeter reads 2.0 A and the voltmeter reads 12 V.



How much energy is transferred by the resistor in 10 seconds?

A 2.4 J

B 14.4 J

C 240 J

D 1440 J

The diagram shows a piece of metal resistance wire.

Which wire, made of the same metal, has a smaller resistance?

A a wire of the same length with a larger diameter

B a wire of the same length with a smaller diameter

C a wire of greater length with the same diameter

D a wire of greater length with a smaller diameter

What is the unit of electromotive force (e.m.f.)?

A. ampere

B. joule

C. volt

D. watt

A student has wires of different lengths and different diameters. The wires are all made of the same metal.

The student measures the resistance of one wire.

Which wire has a greater resistance than the wire he has measured?

A. a shorter wire with a larger diameter

B. a shorter wire with the same diameter

C. a wire of the same length with a larger diameter

D. a wire of the same length with a smaller diameter

Diagram 1 shows two thin, uncharged strips of plastic.

Diagram 2 shows the same strips after they have been rubbed with a dry cloth.

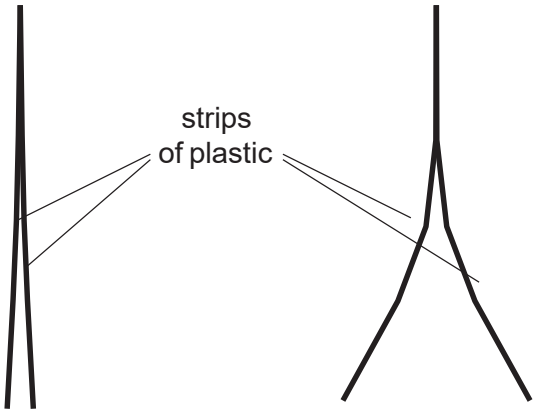


diagram 1 diagram 2

Which row describes the charge on the strips after rubbing, and the force between the strips after rubbing?

	charge on strips	force between strips
A	opposite	attraction
B	opposite	repulsion
C	the same	attraction
D	the same	repulsion

What is the unit of electromotive force (e.m.f.)?

A. ampere

B. newton

C. ohm

D. volt

Which sample of copper wire has the greatest electrical resistance?

	length of wire / m	diameter of wire / mm
A	1.0	2.0
B	1.0	4.0
C	10	2.0
D	10	4.0

Question 18

What is the unit of electrical power?

A. ampere

B. joule

C. volt

D. watt