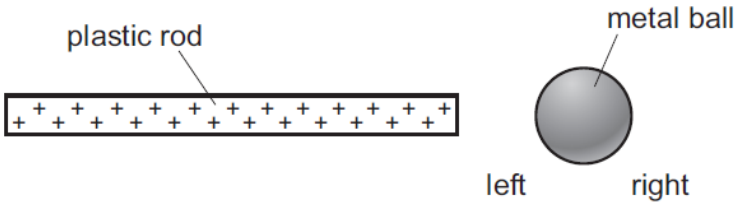
1. Nov/2021/Paper_12/No.31

A positively charged plastic rod is held near but not touching an insulated and previously uncharged metal ball. No charge leaves the rod.



What are possible charges on the left-hand side and right-hand side of the ball?

	charge on left-hand side of ball	charge on right-hand side of ball
A	-2.0×10^{-9} A	-1.0×10^{-9} A
B	-2.0×10^{-9} A	$+2.0 \times 10^{-9}$ A
C	-2.0×10^{-9} C	$+2.0 \times 10^{-9}$ C
D	$+2.0 \times 10^{-9}$ C	-2.0×10^{-9} C

2. Nov/2021/Paper_21/No.5

A plastic rod that is initially neutral is rubbed with a woollen cloth. After the rod has been rubbed, it is positively charged.

(a) **(i)** Explain, in terms of particles, why the rod is now positively charged.

.....

..... [1]

(ii) State what happens to the woollen cloth.

..... [1]

(b) An uncharged, conducting sphere is suspended from an insulating thread. The positively charged rod is placed near to the sphere, as shown in Fig. 5.1.

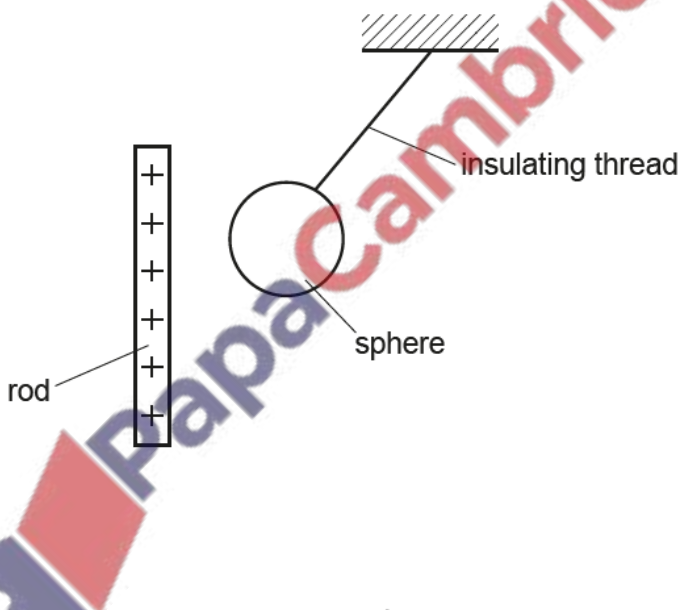


Fig. 5.1

(i) On Fig. 5.1, draw the distribution of charge on the sphere. [2]

(ii) Explain why the sphere is pulled towards the rod.

.....

.....

.....

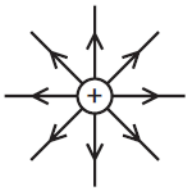
..... [2]

[Total: 6]

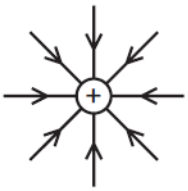
3. June/2021/Paper_11/No.27

Which diagram shows the pattern and direction of the electric field lines near a positive charge?

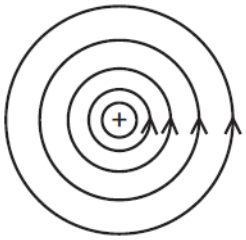
A



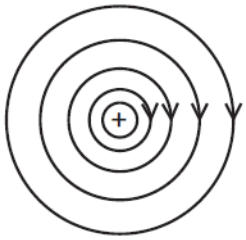
B



C

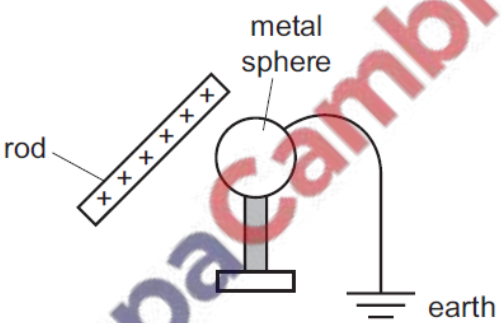


D



4. June/2021/Paper_11/No.28

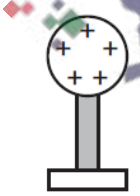
A positively charged rod is held close to an insulated metal sphere. The sphere is earthed as shown.



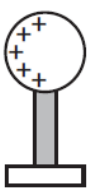
The earth connection is removed and then the rod is removed.

Which diagram shows the charges on the sphere after the rod is removed?

A



B

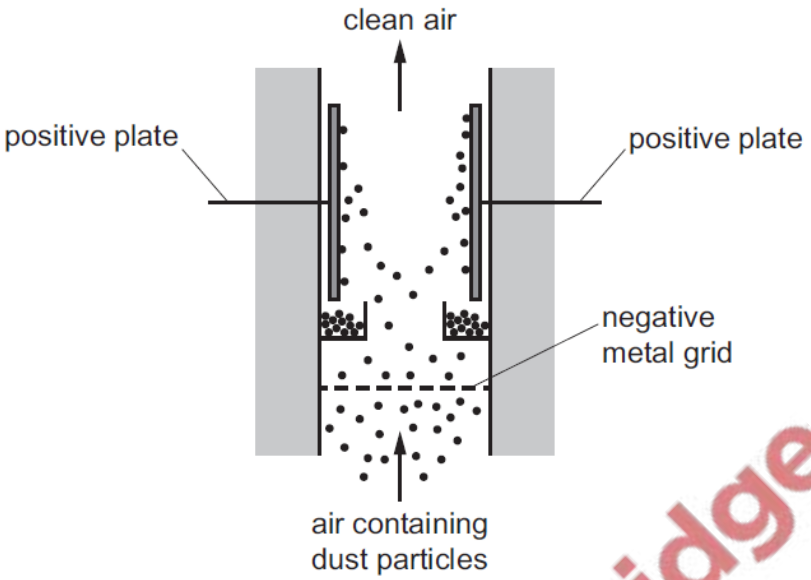


C

D

5. June/2021/Paper_11/No.29

The diagram shows an electrostatic precipitator. It can be used to remove dust from air.



What happens at the negative grid?

A Dust particles gain electrons.

B Dust particles gain protons.

C Dust particles lose electrons.

D Dust particles lose protons.

6. June/2021/Paper_22/No.5

Fig. 5.1 shows a method of producing sandpaper using static electricity.

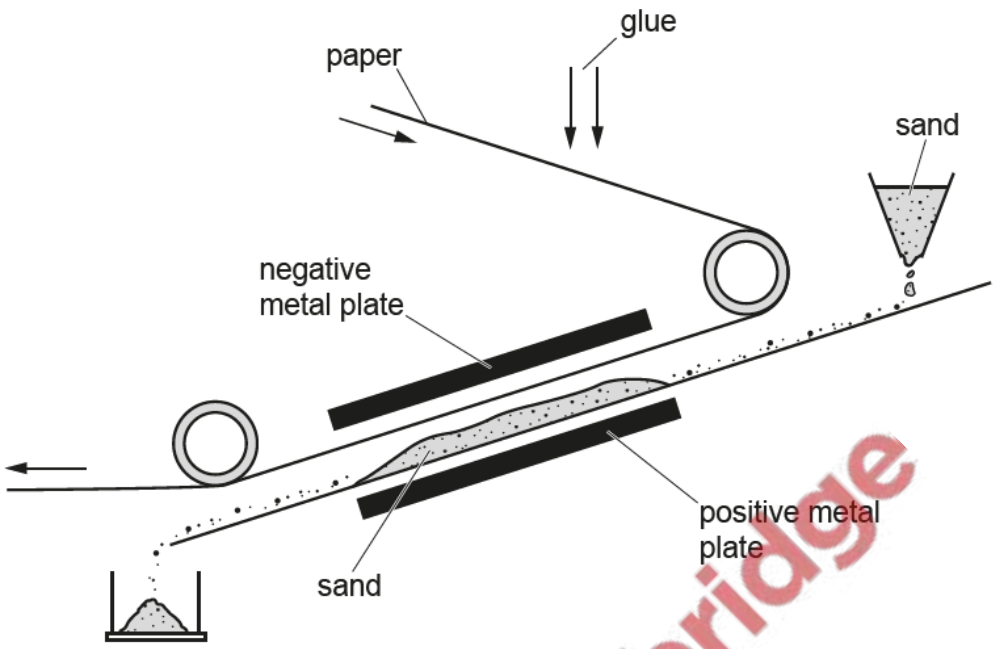


Fig. 5.1

Glue is sprayed on to moving paper. The sticky paper then passes between two metal plates.

One of the plates is positive and the other plate is negative.

There is an electric field between the plates.

(a) On Fig. 5.2, draw the electric field between the two metal plates. Show the direction of the electric field.

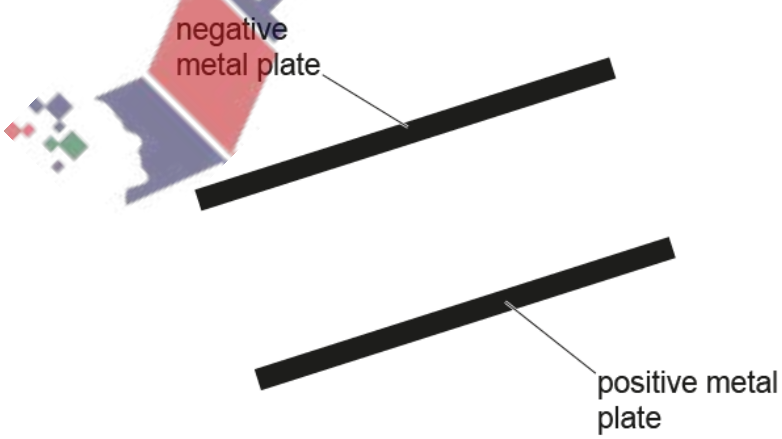


Fig. 5.2

[2]

(b) Grains of sand are present just below the sticky paper.

Each grain of sand is a conductor of electricity.

Fig. 5.3 shows two layers of sand grains in the space between the two plates.

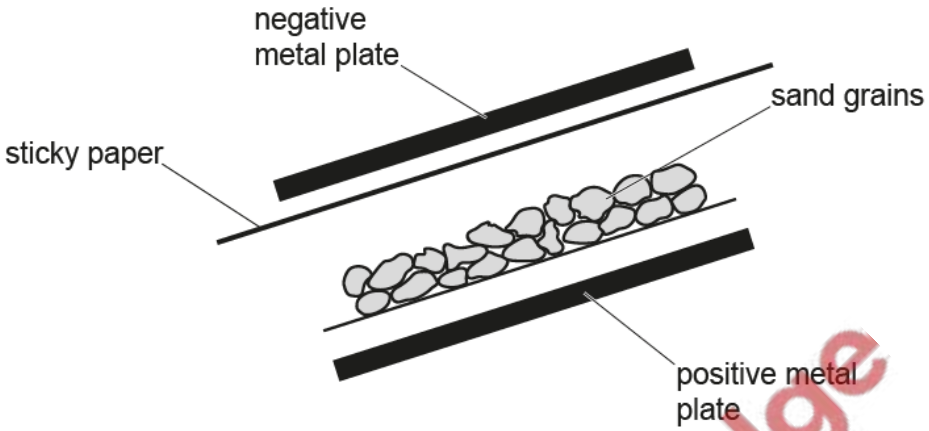


Fig. 5.3

(i) Explain, using ideas about the movement of charge, why the top layer of sand becomes positively charged.

.....

..... [1]

(ii) State why the top layer of sand moves towards the sticky paper.

.....

..... [1]

(c) A student receives an electric shock by walking across a certain type of carpet and then nearly touching a piece of earthed metal with his hand.

The potential difference between the hand and the metal is 2000 V and the charge transferred is 4.0×10^{-4} C.

Calculate the energy transferred when the spark jumps across the air gap from the metal onto his hand.

energy = ... [2]

[Total: 6]