

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Q1.

An insecticide sprayer charges droplets of insecticide.

Figure 2 shows the sprayer being used to spray a leaf.

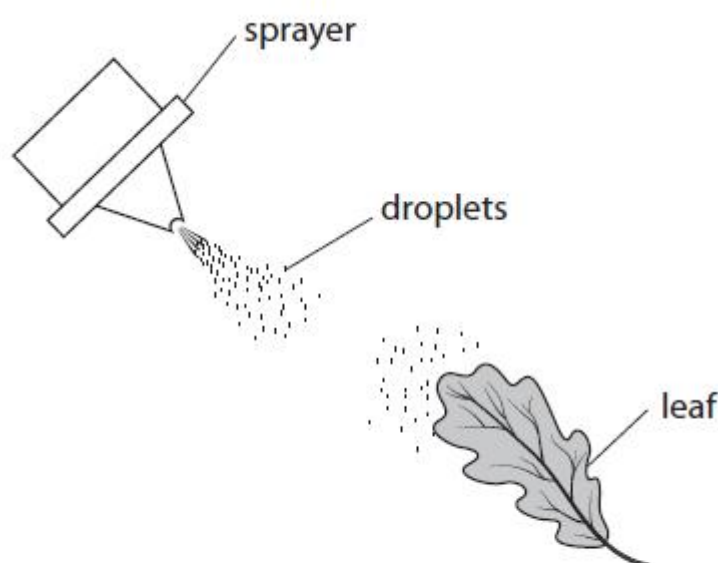


Figure 2

The leaf is connected to the ground (earthed).

Explain how charging the droplets helps to make sure that the leaf gets covered with insecticide.

You may add to Figure 2, including the sign (+ or –) of any charges, to help your answer.

(3)

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(Total for question = 3 marks)

Q2.

Figure 2a shows another gold leaf electroscope that has been given an overall negative charge.

A student connects the metal cap of the charged electroscope to earth with a piece of wire as shown in Figure 2b.

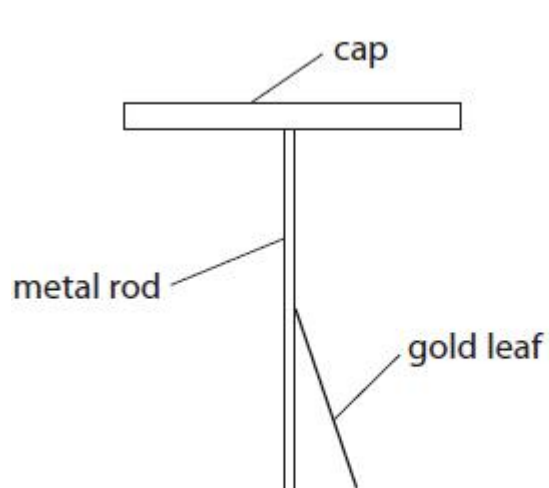


Figure 2a

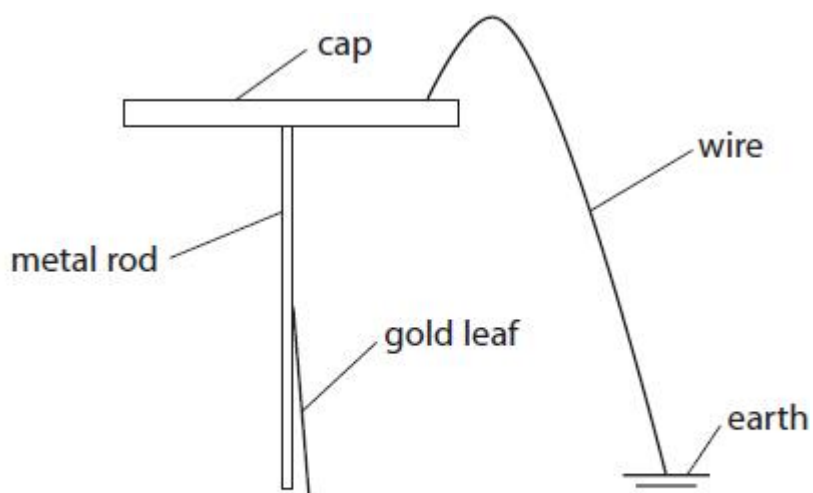


Figure 2b

Explain why the gold leaf has moved.

(2)

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(Total for question = 2 marks)

Q3.

Explain how an aircraft can become electrically charged as it flies through the air.

(2)

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(Total for question = 2 marks)

Q4.

A student rubs a plastic ruler against a woolly jumper.
The student tests the ruler and finds it has a positive charge.
Explain how the ruler becomes positively charged.

(2)

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(Total for question = 2 marks)

Q5.

Figure 1 shows a prize that is made from a metal star on a plastic base.



Figure 1

A person starts to clean the prize by rubbing the plastic base with a dry cloth.

The plastic base becomes positively charged and the cloth becomes negatively charged.

The person then holds the metal star and rubs it with the charged cloth.

The cloth loses its charge.

Explain why the cloth loses its charge.

(2)

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(Total for question = 2 marks)

Q6.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

This question is about static electricity.

Figure 9 shows a plastic block and a metal disc with an insulating handle.

The top surface of the plastic block has a negative charge.

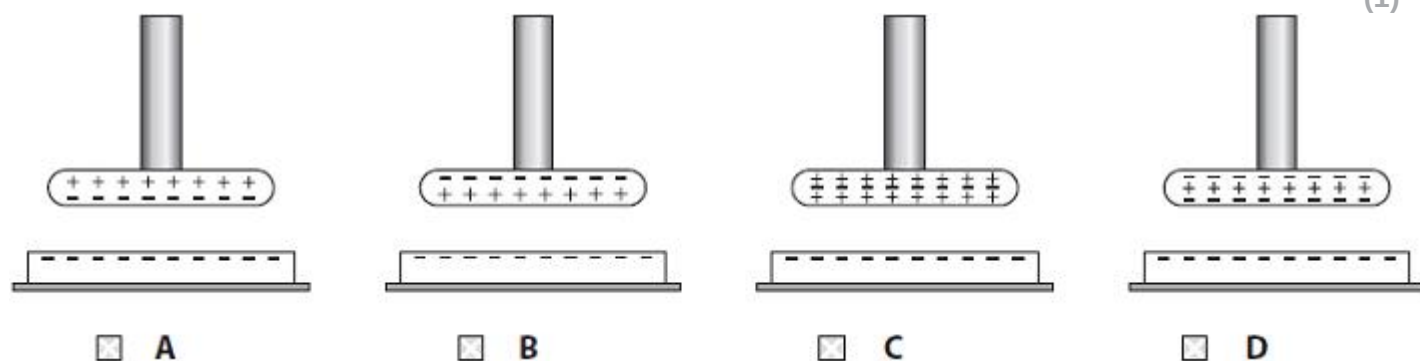
The metal disc has no overall electric charge.



Figure 9

A student uses the insulating handle to hold the metal disc above the plastic block.

(i) Which of these diagrams shows how the charge is distributed on the metal disc?



(1)

(ii) The student keeps holding the metal disc above the charged plastic block and taps the metal disc with a finger.

This earths the metal disc for a short time.

Explain why the disc now has an overall positive charge.

(2)

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(iii) Figure 10 shows the charges on part of the metal disc and the plastic block.

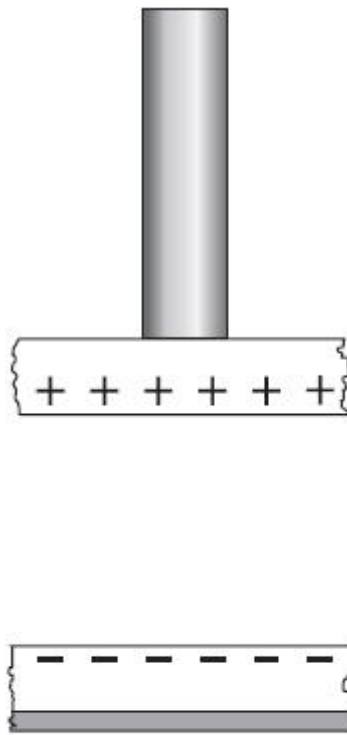


Figure 10

On Figure 10, draw lines to show the shape and direction of the electric field between the metal disc and the plastic block.

(2)

(Total for question = 5 marks)

Q7.

Figure 7 shows two metal spheres.

Metal sphere A is fixed to a table.

Metal sphere B can be moved.

Metal sphere B is placed at a short distance from metal sphere A.

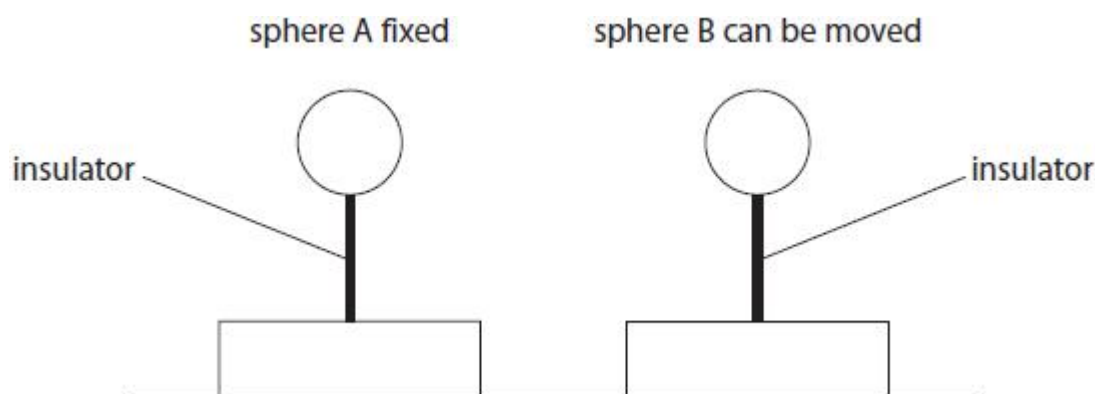


Figure 7

Both spheres are insulated from the table and given a negative charge.

The force between the charged spheres is measured.

(i) Explain, in terms of electric fields, why a force is exerted on sphere B.

(2)

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(ii) Sphere B is moved and the force between the spheres is measured at several different distances.

Figure 8 is a graph of force on sphere B against distance between the centres of the spheres.

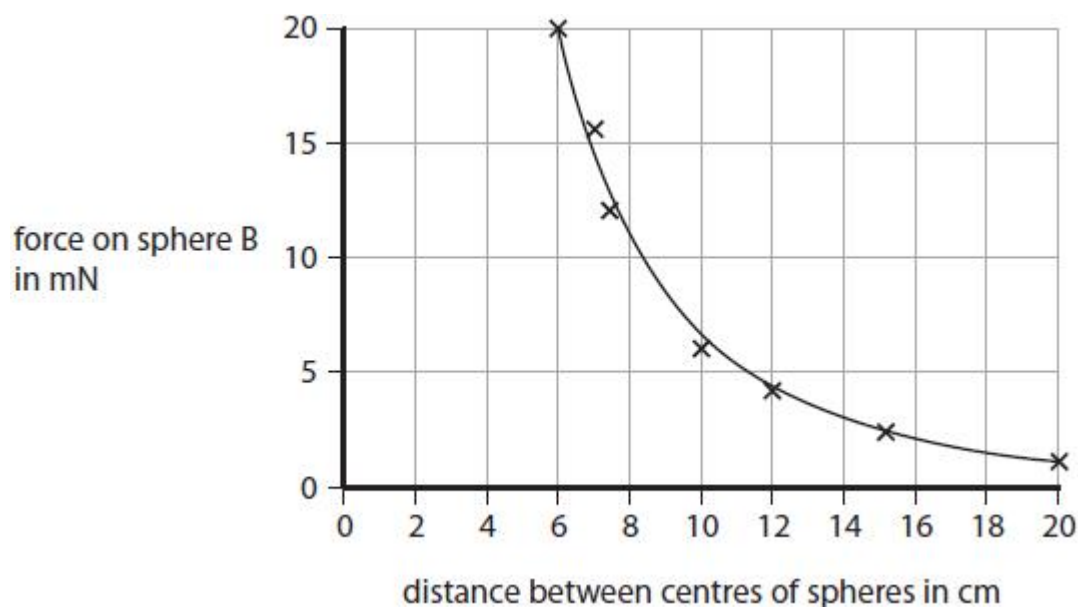


Figure 8

Describe how the force on sphere B varies with the distance between the centres of the spheres.

(2)

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(Total for question = 4 marks)