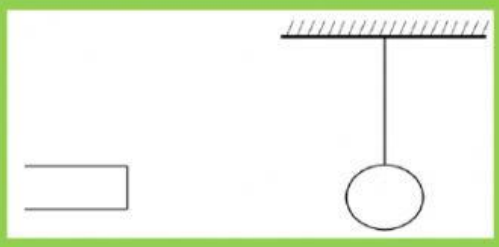
Classwork #2 Static Electricity

Name:_____ **Date:**_____



1. The diagram shows a negatively charged polythene rod brought close to an uncharged, suspended metal-coated polystyrene ball.

A. Briefly describe what is seen to happen to the polystyrene ball.

_____(1)

B. Explain your answer in A.

_____(2)

C. Explain how the polythene rod can be given a negative charged.

_____(2)

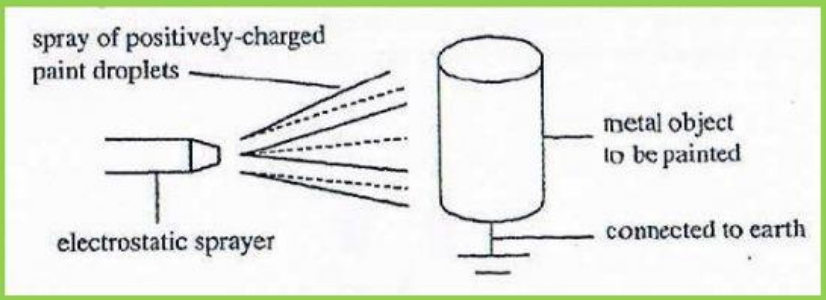
D. Describe what the rod gains in the process of being negatively charged.

_____(2)

E. Explain why it is easy to charge a polythene rod, but not a copper rod.

_____(1)

2. The diagram shows an electrostatic paint sprayer that is used to obtain a uniform coat of paint on metals. The paint is sprayed in the form of positively charged-particles droplets. The metal object is earthed.



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A. Explain why the paint droplets are attracted to the metal.

_____ (2)

B. Explain why the positive charge on the paint droplets helps them spread out uniformly.

_____ (2)

C. Explain why the coat of paint is not uniform if the metal is not earthed.

_____ (2)

3. A polythene rod is charged by rubbing it with soft cloth. The rod attains a negative charge.

A. With reference to the movement of electrons during rubbing, state how each attained their charged.

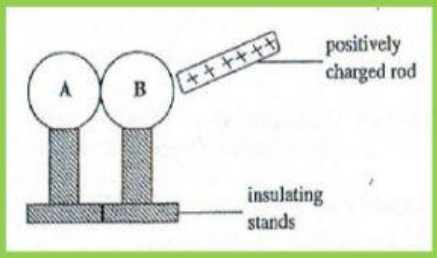
i) cloth

_____ (1)

ii) polythene rod

_____ (1)

B. Two neutral metal spheres A and B on insulating stands are touching each other. A positively charged rod is brought close to the spheres as shown in the diagram below.



i) Name the process that takes place, on the metal spheres, when the charged rod is brought close to the insulated metal spheres.

_____ (1)

ii) Describe in terms of movement of electrons how this process occurs.

_____ (2)

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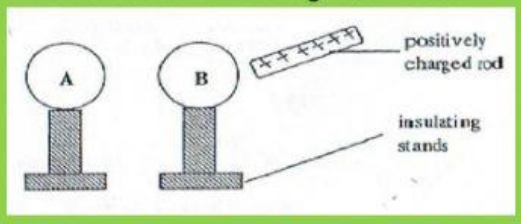
iii) Spheres A and B are then separated using the insulating stands, keeping the positively charged and close to sphere B as shown in the diagram below.



State the charges left on spheres A and B when the spheres are separated.

Sphere A

_____

Sphere B

_____(2)

4. An experiment to show charging by induction uses a metal sphere mounted on an insulated support. The sphere is initially uncharged and is shown in Diagram A.

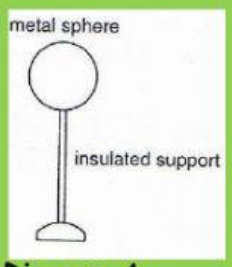


Diagram A

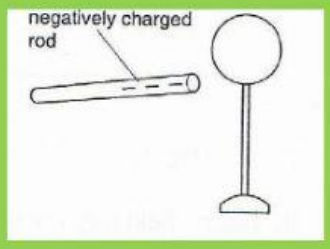


Diagram B

A. Negatively charged rods is brought near the sphere as shown in Diagram B. State and explain the movement of electrons in the sphere that occurs as the rod is brought near.

_____

_____ (2)

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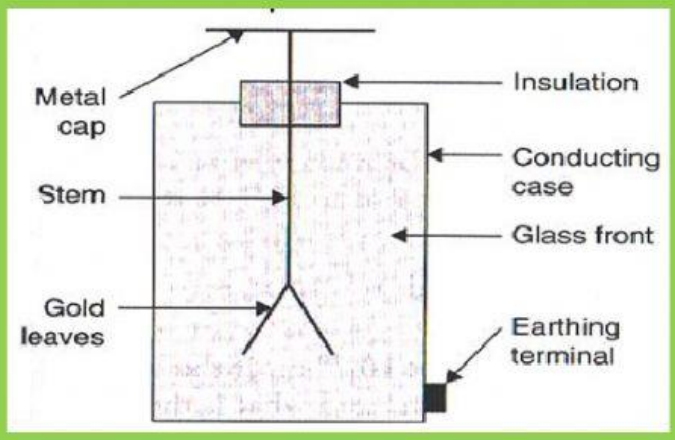
8. An electroscope is a device used in electrostatic experiments and consists of a metal cap connected by a metal stem to two thin gold leaves that can freely rotate. The following picture shows the parts of an electroscope.



A. Explain why the gold leaves are standing apart as seen from the diagram even though nothing is interacting with the electroscope.

_____

_____

_____

_____ (2)

B. Why do the two leaves of neutral electroscope go apart when a positive rod is brought near the cap (but not touching it)?

_____

_____

_____

_____ (2)

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