

E Fields Test Review (A & B)

⚠ This is a preview of the draft version of the quiz

Started: Aug 14 at 12:57pm

Quiz Instructions

Question 1

1 pts

How many electrons are transferred in the process of charging a latex balloon to $4.6 \times 10^{-8} \text{ C}$? Fill in the blank.

_____ $\times 10^{11}$ electrons

Question 2

1 pts

A metal sphere with a charge of $+3 \text{ Q}$ comes into contact with a metal sphere of identical size that has a charge of -7Q . The spheres are then separated. What are the charges on each of the spheres after they separated? Fill in the blank.

___ Q

Question 3

1 pts

A negatively charged rod is brought near a second rod that is neutral and suspended by a nonconducting string. The second rod begins to move toward the negative rod,

showing attraction of the two rods. After the first rod is removed, the second rod

- a. has no net charge
- b. has positive net charge
- c. has a negative net charge
- d. is polarized, with one end negative and one end positive

 b

 c

 a

 d

Question 4

1 pts

A negatively charged rod is brought near a second rod that is neutral and suspended, by a nonconducting string. A wire is connected from the second rod to the ground. With the first rod held in place, the ground wire is cut and the first rod is removed. After the first rod is removed, the second rod

- a. has no net charge
- b. has positive net charge
- c. has a negative net charge
- d. is polarized, with one end negative and one end positive

 a

 c

 b

 d

Question 5**1 pts**

An isolated solid metal sphere that sits on an insulating stand is given a net charge of -5 microcoulomb. Which of the following statements best describes the charged sphere?

- a. the net charge will be distributed evenly throughout the volume of the sphere.
- b. The net charge will be distributed evenly over the surface of the sphere.
- c. The net charge will concentrate on the side of the sphere near the insulating stand.
- d. The net charge will be distributed evenly with half the charge on the outside of tin sphere and half the charge on the inside of the sphere.

 b

 d

 a

 c**Question 6****1 pts**

An isolated solid metal sphere is given a net charge of -5 microcoulomb by touching it with a negatively charged rod. Which of the following statements best describes the charged sphere?

- a. the net charge will be distributed evenly throughout the volume of the sphere.
- b. The net charge will be distributed evenly over the surface of the sphere.
- c. The net charge will concentrate on the side of the sphere near the insulating stand.
- d. The net charge will be distributed evenly with half the charge on the outside of tin sphere and half the charge on the inside of the sphere.

 c

 d

b a**Question 7****1 pts**

The electric force between two charged objects is 0.14 N. If each object is given triple its original charge and the objects are located at their original distance from each other, what is the new force in Newtons?

Question 8**1 pts**

The theoretical distance of an electron (in its ground state) from the proton nucleus of a hydrogen atom is called the Bohr radius, which is approximately 5.29×10^{-11} m. What is the electric force of the proton in Newtons on the electron at this distance?

_____ $\times 10^{-8}$ N

Question 9**1 pts**

Determine the electric field in N/C at a distance of 5 cm from the center of an object that has a net charge of 4 nC.

Question 10**1 pts**

An isolated hollow metal sphere has a net positive charge transferred to it. Where is the electric field strongest?

- Just outside the outer surface of the sphere
- Just inside the outer surface of the sphere
- At all points halfway from the outer surface to the center of the sphere
- At the exact center of the sphere

Question 11**1 pts**

An uncharged solid metal sphere is placed into a uniform electric field directed to the right. Which of the following statements best, describes what will happen to the sphere?

- Charges in the sphere will separate, with the right side of the sphere more negative.
- The field will exert a force on electrons, causing them to move away to the right, leaving the sphere with a net positive charge.
- Since the sphere is uncharged, nothing will happen to it in the field.
- Charges in the sphere will separate, with the right side of the sphere more positive.

Question 12**1 pts**

As the distance from a charge doubles:

- the electric field reduces remains constant and the electric potential reduces to one half
- the electric field reduces to one quarter and the electric potential reduces to one half
- the electric field reduces to one quarter and the electric potential reduces to one quarter
- the electric field reduces to one half and the electric potential reduces to one half

Question 13**1 pts**

Which of the following do NOT obey an inverse square law, that is strength or intensity decreases with the inverse square of distance?

- electric potential
- light intensity
- gravitational field
- electric field

Question 14**1 pts**

Assuming negligible internal resistance in a 9 V battery, what is the change in electric potential energy (Joules) when 0.15 C of charge is transferred between the terminals of the battery?

Question 15**1 pts**

A 12.5 coulomb charge with a mass of 0.65 kilograms is initially at rest. It is released and travels 22.0 meters in a uniform 13.0 volt per meter electric field.

How much work in Joules is done on the charge during this motion?

Question 16**1 pts**

A 12.5 coulomb charge with a mass of 0.65 kilograms is initially at rest. It is released and travels 22.0 meters in a uniform 13.0 volt per meter electric field.

What is the speed in m/s of the charge after traveling 22.0 meters?

Question 17**1 pts**

A conducting sphere with a mass of 3.0 kilograms and a charge of 12.0 coulomb is initially at rest. Determine its speed in m/s after being accelerated through a 26-volt potential difference.

Question 18**1 pts**

When a long-haired woman puts her hands on a Van de Graaff generator (aka a large conducting sphere with charge being delivered to it by a conveyor belt) her hair stands on end. Which of the following explains this phenomenon?

Her hair will not stand on end

Like charges attract

- The Van de Graaf generator makes a magnetic field that draws her hair up on end
- Like charges repel
- Her body is conducting a current to the ground

Question 19**1 pts**

Two charged particles exert a force of magnitude F on one another. If the distance between them is halved and the charge of one of the particles is doubled, by what factor is the new force acting between them?

Question 20**1 pts**

A solid copper sphere has a charge of $+Q$ on it. Where on the sphere does the charge reside?

- $-Q$ at the center of the sphere and $+2Q$ on the outer surface
- The charge is spread evenly throughout the sphere
- $+Q$ at the center of the sphere
- $Q/2$ at the center of the sphere and $Q/2$ on the outer surface
- $+Q$ on the outer surface.

Question 21**1 pts**

If the distance between two positive point charges is quadrupled, then the strength of the electrostatic repulsion between them will decrease by a factor of ____.

Write as a decimal.

Question 22**1 pts**

A sphere of charge $+2Q$ is fixed in position. A smaller sphere of charge $+2q$ is placed near the larger sphere and released from rest. The small sphere will move away from the large sphere with

- increasing velocity and increasing acceleration
- decreasing velocity and decreasing acceleration
- increasing velocity and decreasing acceleration
- decreasing velocity and increasing acceleration

Question 23**1 pts**

An object of charge $+q$ experiences an electric force F when placed at a particular location in an electric field, E .

Therefore, if an object of charge $-3q$ were placed at the same location where the first charge was, it would feel an electric force of

- $-3F$
- $F/3$
- $-2F/q$
- $-2qF$

Question 24**1 pts**

The electric force between two charged objects is 500 N. If the objects are moved five times as far apart, what is the new force in Newtons?

Question 25**1 pts**

Two unequally charged particles are 1 meter apart. The first charge is twice that of the second. If the lesser charge experiences a force of F , what is the force experienced by the second charge?

- $-F$
- $4F$
- $2F$
- $.25F$
- $.5F$
- F

Saving...

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