

# CH. 1

## MULTIPLE CHOICE QUESTIONS

1. A coulomb is the same as:

**D) An ampere· second**

2. A kiloampere· hour is a unit of:

**D) Charge**

3. The magnitude of the charge on an electron is approximately:

**D)  $1.6 \times 10^{-19}$  C**

4. The charge on a glass rod that has been rubbed with silk is called positive:

**A) By arbitrary convention**

5. To make an uncharged object have a negative charge we must:

**D) Add some electrons**

6. To make an uncharged object have a positive charge:

**D) Remove some electrons**

7. An electrical insulator is a material:

**D) Cannot be a pure chemical element**

8. A conductor is distinguished from an insulator with the same number of atoms by the number of:

**B) nearly free electrons**

9. A positively charged metal sphere A is brought into contact with an uncharged metal sphere B. As a result:

**A) Both spheres are positively charged**

10. Which of the following terms is used to describe a material that does not allow electrons to easily move through it?

**c) Insulator**

11. Silicon is an example of what type of material?

**c) Semiconductor**

12. The electrostatic force between acting on each particle due to the presence of the other

**c) Depends on  $r^2$ .**

13. the net electric charge on an object is

**e) Quantized.**

14. Principles describes how the net electric charge of an isolated system undergoing any process remains constant?

**b) Law of the conservation of electric charge**

## CH. 2

# MULTIPLE CHOICE QUESTIONS

1. An electric field is most directly related to:

C) The force acting on a test charge

2. As used in the definition of electric field, a “test charge”:

D) None of the above

3. The units of the electric field are:

B) N/C

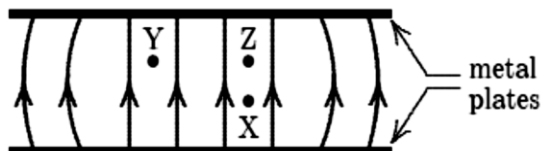
4. Electric field lines:

C) Are none of the above

5. Choose the correct statement concerning electric field lines:

B) Field lines are close together where the field is large

6. The diagram shows the electric field lines due to two charged parallel metal plates. We conclude that:



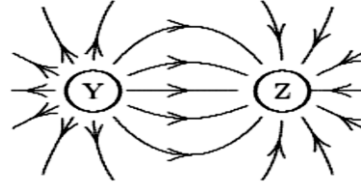
B) A proton at X would experience the same force if it were placed at Y

7. The magnitude of the electric field at a distance  $r$  from an isolated point particle with charge  $q$  is:

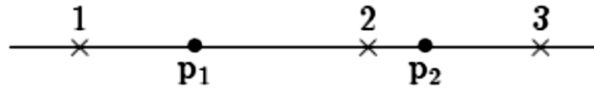
A)  $kq/r^2$

8. The diagram shows the electric field lines in a region of space containing two small charged spheres (Y and Z). Then:

D) Y is positive and Z is negative



9. Two protons ( $p_1$  and  $p_2$ ) are on the x axis, as shown below. The directions of the electric field at points 1, 2, and 3, respectively, are:



E)  $\leftarrow, \leftarrow, \rightarrow$

10. The diagram shows a particle with positive charge  $Q$  and a particle with negative charge  $-Q$ . The electric field at point P on the perpendicular bisector of the line joining them is:

A)  $\uparrow$



11. The electric field due to a uniform distribution of charge on a spherical shell is zero:

E) Only inside the shell

F)

12. The force exerted by a uniform electric field on a dipole is:

E. none of the above

## CH. 3

# MULTIPLE CHOICE QUESTIONS

1. A charged point particle is placed at the center of a spherical Gaussian surface. The electric flux  $\Phi_E$  is changed if:

C) The point charge is moved off center (but still inside the original sphere)

2. Choose the INCORRECT statement:

D) According to Gauss' law, if a closed surface encloses no charge, then the electric field must vanish everywhere on the surface

3. What is the best choice for the shape of a Gaussian surface?

E) It should be one that matches the symmetry of the charge distribution.

4. A point particle with charge  $q$  is placed inside the cube but not at its center. The electric flux through any one side of the cube:

E) cannot be computed using Gauss' law

5. Principles or laws describes the electric flux through a surface that encloses a charge?

B) Gauss' law

6. Gauss' law relate the electric field at points on a Gaussian surface?

D) net charge enclosed by the surface

7. principles can be derived from Gauss' law?

B) Coulomb's law

8. The electric field at the surface of a conductor be perpendicular to the surface. Why?

B) If it was not perpendicular, then charges on the surface would be moving

## CH. 4

# MULTIPLE CHOICE QUESTIONS

- 1) Positive charge is distributed uniformly throughout a non-conducting sphere. The highest electric potential occurs:  
**A) At the center**
  
- 2) The equipotential surfaces associated with a charged point particles are:  
**D) Concentric spheres centered at the particle**
  
- 3) The quantity that is equal to the electric potential?  
**E)  $U/q$**
  
- 4) The SI units for the electric potential?  
**D) volt (V)**
  
- 5) Which one of the following phrases best describes the electric potential of a charged particle?  
**D) the potential energy per unit charge**
  
- 6) A uniform electric field is directed parallel to the +y axis. If a positive test charge begins at the origin and moves upward along the y axis, how does the electric potential vary, if at all?  
**A) The electric potential will decrease with increasing y.**

7) Which one of the following statements concerning equipotential surfaces is true?

**D) The net work done by electric forces that move a charge along an equipotential surface is equal to zero joules.**

8) Which one of the following statements concerning equipotential surfaces is false?

**B) No work is done by the net electric force as a charge moves from one equipotential surface to another.**

9) Complete the following statement: Along an equipotential surface,

**C) The electric field lines are perpendicular to the surface.**

10) Equipotential surfaces associated with an electric dipole are:

**D) None of the above**