Quiz #4: Electrostatics

Question 1 (2 points)
When the distance between two charges is doubled, the electric force between the charges is

a) increased by a factor of two  
b) increased by a factor of four  
c) decreased by a factor of two  
d) decreased by a factor of four  
e) none of the above

\[ F = \frac{kq_1q_2}{r^2} \]

If the distance doubled, the force decreases by a factor of \((2)^2 = 4\)

Question 2 (2 points)
A positive charge and a negative charge held near each other are released. As they move, the force on each particle

a) increases  
b) decreases  
c) stays the same

The charges attract each other and move closer together so the force increases.

Question 3 (2 points)
A positive ion has more

a) electrons than neutrons  
b) electrons than protons  
c) protons than electrons  
d) protons than neutrons  
e) neutrons than protons

Question 4 (2 points)
What are the three different ways of charging an object?

1) charging by friction  
2) charging by contact  
3) charging by induction

Question 5 (2 points)
Strictly speaking, when an object becomes positively charged, what happens to its mass? Why?

When an object becomes positively charged, its mass decreases slightly. This is because the object becomes positively charged by losing one or more electrons, and electrons have mass (although very small).