Name: DISC: Score: / 20

|  |  |  |  |
| --- | --- | --- | --- |
| Q1 | Q2 | Q3 | Q4 |
|  |  |  |  |
| 5 | 5 | 10 | 5 |

Instructions:

* Do your own work.
* Answer the questions below in the space provided.
* ***Make sure you show all your work and any equations that you use***.
* Please place a box around your answers.
* Remember to give the correct units with all numerical answers

|  |  |
| --- | --- |
| R | C |
| Ω |  |

1. The discharging of a capacitor is described by the following equation: . Using the information in the above table, how long (in seconds) does it take the for the charge to decay to ?

Answer: 5 pts

1. The following two questions examine your mastery of two important concepts in electrodynamics.
   1. In your own words, explain the difference between a *conductor* and an *insulator*:

Answer: 2 pts

* 1. If a metallic sphere is to be charged by *conduction*, how would you do it:

Answer: 3 pts.

1. Consider the charge distribution in the diagram below:

**2**

**1**

**-q**

**-q**

**3**

**+q**

**-q**

* 1. Calculate the magnitude of the force experienced by the charge from the charge labeled **1:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Value for : 1 pt.  Force : 3 pts. |  |  |  |  |
|  |  |  |  |  |

Dipole: 2 pts

* 1. The charge combination forms an *electric dipole.* Why?
  2. Using the definition of the *electric dipole moment* ( ) find:

: 1 pt.

: 3 pts.

* + 1. (be sure to include the direction):
    2. The total force on the dipole :