Answer on Question #44144-Physics-Electrodynamics

Question. No: 3
A person walks by. And the person contains electrons. Therefore, there is a presence of current. Either yes or no justify this statement with reason.

Solution:

By the definition: an electric current is a flow of electric charge under the influence of electric field. We can see that person doesn't create potential difference and electrical field.

Question. No: 4
A rubber balloon has a lot of extra electrons deposited on it, giving it a negative charge. When the balloon is brought near an uncharged metal sphere as shown in figure:
Select one the most closely related choice given below and write the reason of your selected choice as well. Marks 3+4 = 7
a) Electrons from the sphere will be attracted to the balloon and leap from the sphere to the balloon
b) Protons from the sphere will be attracted to the balloon and leap from the sphere to the balloon
c) The balloon will attract electrons in the sphere and repeal protons in the sphere, so the net force on the sphere is zero
d) The balloon will attract electrons in the sphere and attract protons in the sphere, so the net force on the sphere is zero
e) The balloon will cause a polarization of charge in the sphere

Solution:

e) The balloon will cause a polarization of charge in the sphere

Negative charge creates electric field, and that's why balloon will cause polarization of charge in sphere. Balloon and sphere will interact, Coulomb's law states that:
The magnitude of the electrostatic force of interaction between two point charges is directly proportional to the scalar multiplication of the magnitudes of charges and inversely proportional to the square of the distance between them.
The force is along the straight line joining them. If the two charges have the same sign, the electrostatic force between them is repulsive; if they have different sign, the force between them is attractive.