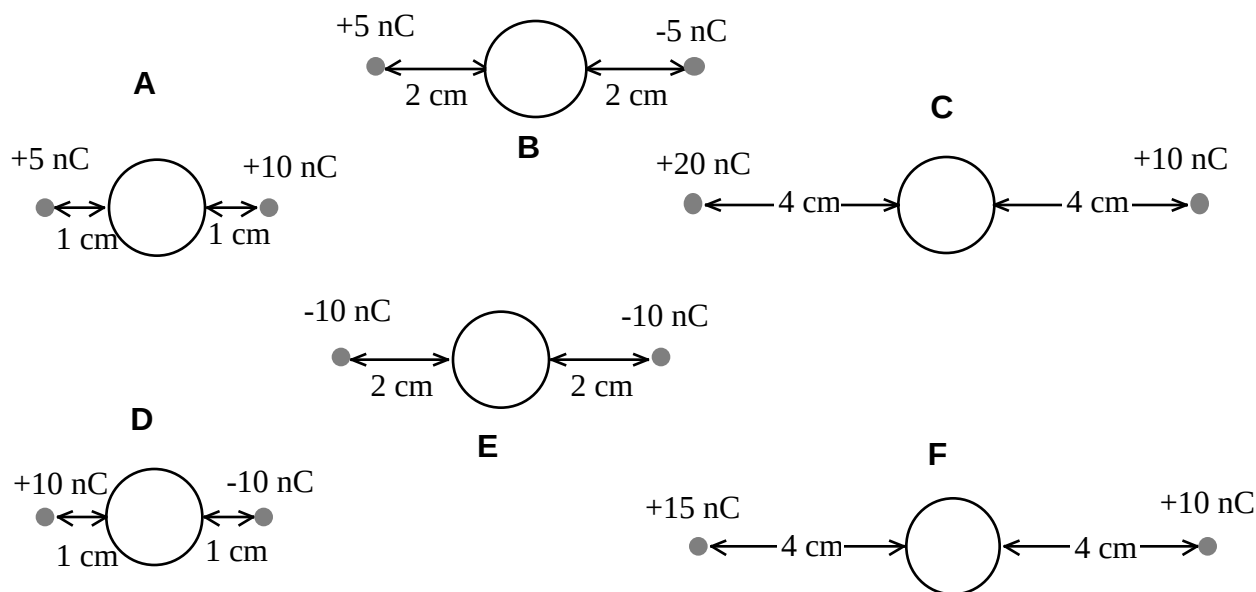


Point Charges Outside Conducting Spheres—Electric Field Within ¹³⁴

Shown below are six identical hollow spheres with a radius of 1 cm made of an electrically conducting material such as copper. Outside these spheres, at various distances, are two electric charges of various magnitudes. Some of the charges are positive and some are negative. Given in each figure is the sign and magnitude of the charge, as well as the distance of the charge from the sphere. Each figure is independent of the others (they do not affect each other).

Rank these situations, from greatest to least, on the basis of the strengths (magnitudes) of the electric fields at the centers of the spheres.



Greatest 1_____ 2_____ 3_____ 4_____ 5_____ 6_____ Least

Or, the strength of the field in the center is the same for all six spheres (but not zero). _____

Or, the strength of the field in the center is a zero for all six spheres. _____

Please carefully explain your reasoning.

How sure were you of your ranking? (circle one)

Basically Guessed

Sure

Very Sure

1 2 3 4 5 6 7 8 9 10

¹³⁴ C. Hieggelke, D. Maloney, T. O’Kuma