

PHYSICS 1020

Homework #5

(Due March 22, 2010)

1. (Giancoli 17-8) What potential difference is needed to give a helium nucleus ($Q = 2e$) 65.0 keV of kinetic energy?
2. (Giancoli 17-9) Two parallel plates, connected to a 200-V power supply, are separated by an air gap. How small can the gap be if the air is not to become conducting by exceeding its breakdown value of $E = 3 \times 10^6$ V/m?
3. (Giancoli 17-32) A 9500-pF capacitor holds plus and minus charges of 16.5×10^{-8} C. What is the voltage across the capacitor?
4. (Giancoli 17-33) The potential difference between two short sections of parallel wire in air is 120 V. They carry equal and opposite charge of magnitude 95 pC. What is the capacitance of the two wires?
5. (Giancoli 17-43) What is the capacitance of a pair of circular plates with a radius of 5.0 cm separated by 3.2 mm of mica?
6. (Giancoli 17-48) How much energy is stored by the electric field between two square plates, 8.0 cm on a side, separated by a 1.5 mm air gap? The charges on the plates are equal and opposite and of magnitude 420 μ C.