During a lightning storm, the separation between the clouds and the earth acts as a giant capacitor with a capacitance of 2500 F. If the transmitting tower of radio station KBOZ is hit by a bolt of lightning carrying 50 C of charge, what is the potential difference between the cloud and the tower?

Solution: Capacitance of the body (or the system of bodies) is the ability to store an electrical charge.

Assuming that lower surface of the cloud and the earth surface are forming a parallel-plate capacitor, and that the tower has the same potential as the earth surface, we can calculate the potential difference between the cloud and the tower V as $V = \dfrac{q}{C}$, where q is the charge, carried with the lightning, C; C is the capacitance of the cloud-earth surface system.

Then, $V = \dfrac{50}{2500} = 0.02$ V.

Answer: 0.02 V.