56. (a) We found in part (e) of problem 45 in Chapter 27 that the magnitude of the electric field is $E = 16$ V/m. Taking this to be roughly constant over the small distance ($\ell = 0.50$ m) involved here, then we approximate the potential difference between the man's feet as

$$\Delta V \approx E\ell = 8 \text{ V} .$$

(b) The voltage found in part (a) drives a current i through the two feet (each represented by $R_f = 300\,\Omega$) and the torso (represented by $R_t = 1000\,\Omega$). Thus,

$$i = \frac{\Delta V}{2R_f + R_t} = \frac{8\,\text{V}}{2(300\,\Omega) + 1000\,\Omega}$$

which yields $i \approx 5$ mA.

(c) Our value for i is far less than the stated 100 mA minimum required to put the heart into fibrillation.