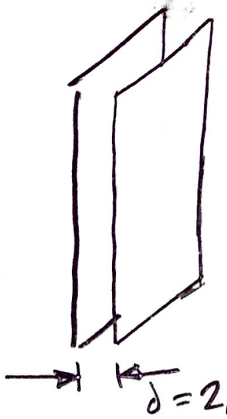
8.19 $C = 180.0\,\mu F = 180.0e-6\,F$

$\Delta V = 120.0\,V$

$Q = C\Delta V$

$= (180e-6)(120\,V) = \boxed{2.160e-2\,C}$

8.25



Parallel-plate capacitor. The problem refers to the parallel plates as "empty" because there will sometimes be a dielectric placed between the plates to increase the capacitance of the system.

$C = 5.0\ pF$
$= 5.0\ picoFarads$
$= 5.0e\text{-}12\ F$

$d = 2.0\ mm$
$= 2.0e\text{-}3\ m$

$A = ?$

$$C_{\parallel} = \frac{A}{d}\varepsilon_0 \rightsquigarrow A = \frac{Cd}{\varepsilon_0}$$

$$A = \frac{(5.0e\text{-}12)(2e\text{-}3)}{(8.85e\text{-}12)} = \boxed{0.00113\ m^2}$$

$$= 11.3\ cm^2$$

8.28

What is capacitance of earth?

Strategy: 1. $C = \frac{Q}{\Delta V}$

2. Find V for earth relative to V=0 at r=∞

$V = \frac{kQ}{r}$

3. Substituting in:

$C = \frac{Q}{kQ/r} = \frac{r}{k} = r 4\pi\varepsilon_0$

Either way.

Solving w/ values:

$C = \frac{6.4De6\ m}{8.99e9\ Nm^2/C^2} = \boxed{7.12e-4\ F}$