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(35) (a) $C_{eq} = 6C = 6(4.7\times10^{-6}\,F) = \underline{28\,\mu F}$

(b) $\frac{1}{C_{eq}} = \frac{6}{C} = \frac{6}{4.7\times10^{-6}\,F}$ $\quad C_{eq} = \underline{.78\,\mu F}$

(36) maximum (in parallel)

$C_{eq} = 3200\times10^{-12}\,F + 7500\times10^{-12}\,F + 0.01\times10^{-6}\,F$

$= \underline{2.1\times10^{-8}\,F}$

Minimum (in series)

$C_{eq} = \left[(3200\times10^{-12}F)^{-1} + (7500\times10^{-12}F)^{-1} + (0.01\times10^{-6}F)^{-1}\right]^{-1}$

$= \underline{1.8\times10^{-9}\,F}$

(37) $C_{series} = \left(\frac{1}{3\times10^{-6}F} + \frac{1}{4\times10^{-6}F}\right)^{-1} = 1.71\times10^{-6}\,F$

$C_{eq} = 2\times10^{-6}F + 1.71\times10^{-6}F = \underline{3.71\times10^{-6}\,F}$

(38) $V_{2\mu F} = \underline{26\,V}$

$V_{series} = 26V \qquad C = \frac{q}{V} \qquad q = CV = (1.71\times10^{-6}F)(26V)$

$= 4.45\times10^{-5}\,C$

$V = \frac{q}{C}$

$V_{3\mu F} = \frac{4.45\times10^{-5}C}{3\times10^{-6}\,F} = \underline{15V}$

$V_{4\mu F} = \frac{4.45\times10^{-5}C}{4\times10^{-6}\,F} = \underline{11V}$

(39) To decrease capacitance, a capacitor must be added in series. This means existing connections must be broken.

$$C_{eq} = \left(\frac{1}{C_1} + \frac{1}{C_2}\right)^{-1}$$

$$C_2 = \left(\frac{1}{C_{eq}} - \frac{1}{C_1}\right)^{-1} = \left(\frac{1}{2900\times10^{-12}\,F} - \frac{1}{4800\times10^{-12}\,F}\right)^{-1}$$

$$C_2 = 7300\ pF$$

(40) An 11 μF capacitor must be added in parallel

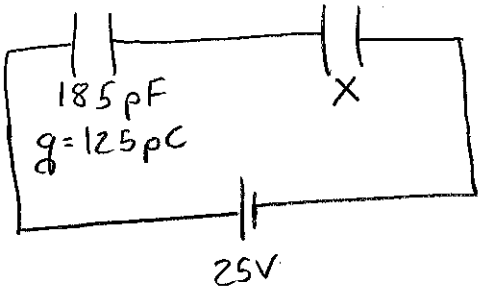
(41) $$C_{2/3} = \left(\frac{1}{C_2} + \frac{1}{C_3}\right)^{-1}$$

$$C_{eq} = C_1 + \left(\frac{1}{C_2} + \frac{1}{C_3}\right)^{-1} = C_1 + \left(\frac{C_2 + C_3}{C_2 C_3}\right)^{-1} = C_1 + \frac{C_2 C_3}{C_2 + C_3} = \frac{C_1C_2 + C_1C_3 + C_2C_3}{C_2 + C_3}$$

(42) $V_1 = 45V$ $\quad q_1 = C_1V_1 = (22.6\times10^{-6}f)(45V) = 1.0\times10^{-3}\,C$

$V_{2/3} = 45V$ $\quad q_{2/3} = C_{2/3}V_{2/3} = (60.27\times10^{-6}F)(45) = 2.7\times10^{-3}\,C = q_2 = q_3$

(48)



since they are in series, both have the same charge and the equivalent capacitor also has the same charge.

$$C_{eq} = \frac{q}{V} = \frac{125\times10^{-12}\,C}{25\,V} = 5\times10^{-12}\,F$$

$$\frac{1}{C_{eq}} = \frac{1}{185\times10^{-12}\,F} + \frac{1}{X}$$

$$X = \left(\frac{1}{C_{eq}} - \frac{1}{185\times10^{-12}\,F}\right)^{-1} = \left(\frac{1}{5\times10^{-12}\,F} - \frac{1}{185\times10^{-12}\,F}\right)^{-1} = 5.14\times10^{-12}\,F$$