

15) In Fig. 25-31, a 20.0 V battery is connected across capacitors of capacitances $C_1 = C_6 = 3.00 \mu\text{F}$ and $C_3 = C_5 = 2.00C_2 = 2.00C_4 = 4.00 \mu\text{F}$. What are (a) the equivalent capacitance C_{eq} of the capacitors and (b) the charge stored by C_{eq} ? What are (c) V_1 and (d) q_1 of capacitor 1, (e) V_2 and (f) q_2 of capacitor 2, and (g) V_3 and (h) q_3 of capacitor 3?

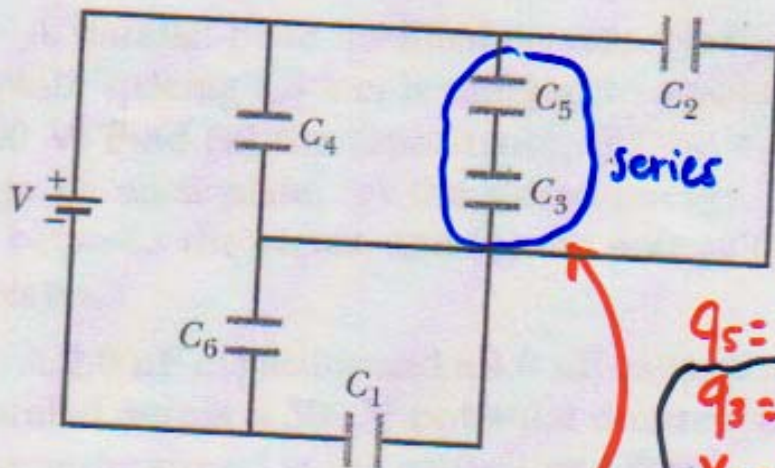
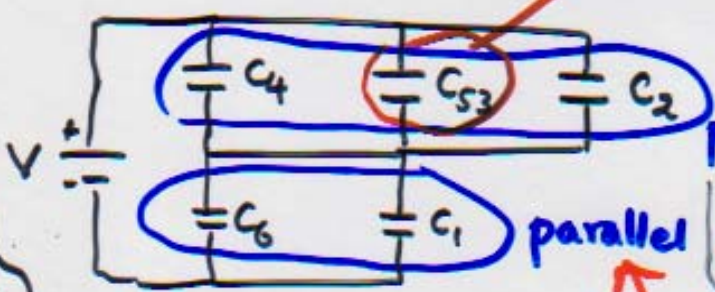


Fig. 25-31 Problem 15.

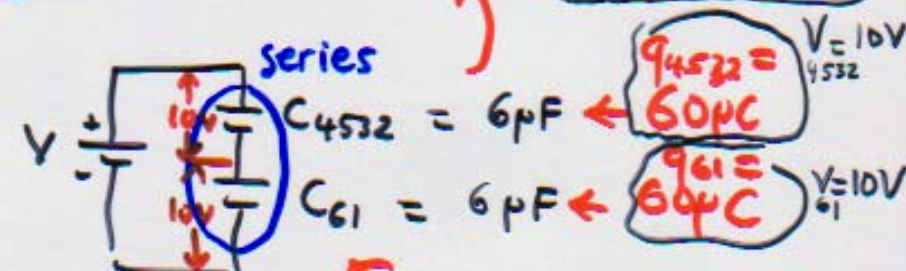
$q_5 = 20 \mu\text{C}$
 $q_3 = 20 \mu\text{C}$
 $V_3 = q_3 / C_3 = 5\text{V}$

$q_{53} = 20 \mu\text{C}$
 $C_{53} = 2 \mu\text{F}$

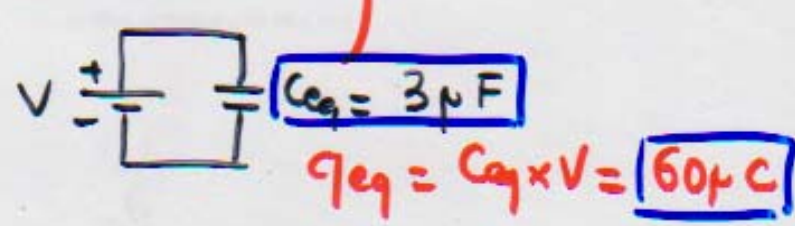
$V_2 = 10\text{V}$
 $q_2 = V_2 C_2 = 20 \mu\text{C}$



$V_1 = 10\text{V}$
 $q_1 = C_4 = 30 \mu\text{C}$



$q_{4532} = 60 \mu\text{C}$
 $q_{61} = 60 \mu\text{C}$



$C_{eq} = 3 \mu\text{F}$
 $q_{eq} = C_{eq} \times V = 60 \mu\text{C}$