Be sure to show all work!

(a) \[ C_2 \text{ and } C_3 \text{ in parallel. They simply add: } C_{23} = C_2 + C_3. \]
\[ C_5 \text{ and } C_6 \text{ in parallel. They simply add: } C_{56} = C_5 + C_6. \]
Now you get configuration II. \( C_{23}, C_4 \) and \( C_{56} \) in series. The effective capacitance corresponding to these three capacitors is given by:
\[ \frac{1}{C_{eff}} = \frac{1}{C_{23}} + \frac{1}{C_4} + \frac{1}{C_{56}}. \]
Now you get configuration III, where \( C_3 + C_4 \) are in parallel. The last two capacitors add up to give \( C_{12,456} = C_1 + C_{23} + C_{56} \), as in configuration IV.

\[ (A) \quad C_{12,456} = C_1 + \left[ \frac{1}{C_{23}} + \frac{1}{C_4} + \frac{1}{C_{56}} \right]^{-1} = \frac{20.45 \mu F}{5.45 \mu F} = 3.74 \mu F. \]

**Method I:** Voltage across A, B is 150V. This means voltage across \( C_1 \) is 150V. Also, voltage across \( C_{23}, C_4 \) and \( C_{56} \) is 150V. Therefore, charge on \( C_{23} \) or \( C_4 \) or \( C_{56} \) is \( Q_{23,4,56} = C_{23,4,56}V = 5.45 \times 150 \text{ (\mu F, V)} = 817.5 \text{ \mu C}. \)

**Method II:** Alternatively, find the total voltage in the circuit, which is \( Q_{total} = \frac{C_{23,4,56}}{C_{12,456}}V = 20.45 \times 150 \text{ (\mu F, V)} = 3067.5 \text{ \mu C}. \)

Then, find charge on \( C_1 \) = \( C_1V = 15 \times 150 \text{ (\mu F, V)} = 2250 \text{ \mu C}. \)

The charge on \( C_{23} \) or \( C_4 \) or \( C_{56} \) is \( 3067.5 - 2250 = 817.5 \text{ \mu C}. \)

Recall that when the capacitors are in series, they have the same charge.

(b) Part (b) total points 12, 2 for correct approach, 1 for sig. fig. except in last step.

(c) Same as part (b).