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Question

Consider the combination of capacitors shown in the diagram, where $C_1 = 3.00\mu\text{F}$, $C_2 = 11.0\mu\text{F}$, $C_3 = 3.00\mu\text{F}$, and $C_4 = 5.00\mu\text{F}$.

Figure A

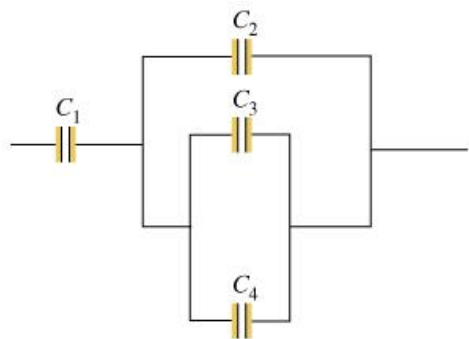
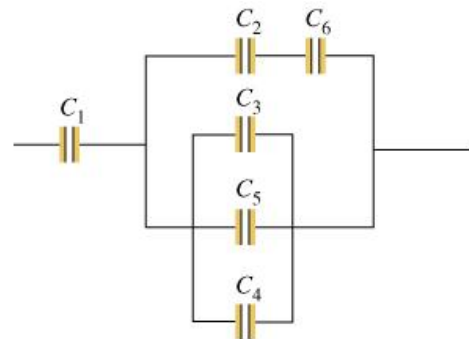


Figure B




Find the equivalent capacitance C_A of the network of capacitors. Express your answer in microfarads.

Two capacitors of capacitance $C_5 = 6.00\mu\text{F}$ and $C_6 = 3.00\mu\text{F}$ are added to the network, as shown in the diagram. (Part B figure) Find the equivalent capacitance C_B of the new network of capacitors. Express your answer in microfarads.

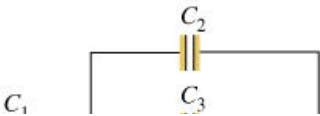
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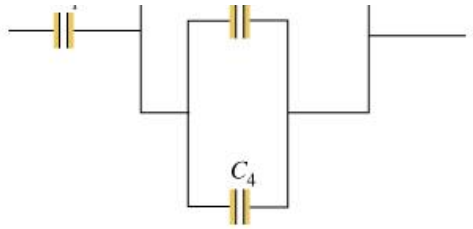
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equivalent capacitance is as follows

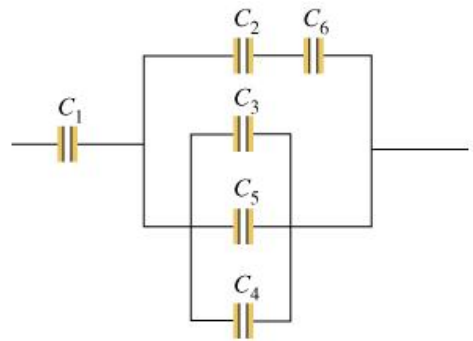
$C_1 \text{ series} (C_2 \text{ parallel} (C_3 \text{ parallel} C_4))$

$C_1 \text{ series} (C_2 \text{ parallel} (C_3 + C_4))$

$C_1 \text{ series} (C_2 + C_3 + C_4)$

$C_1 * (C_2 + C_3 + C_4) / (C_1 + C_2 + C_3 + C_4)$

$3 * (11 + 3 + 5) / (3 + 11 + 3 + 5) = 2.591 \mu\text{F}$



equivalent capacitance is as follows

$C_1 \text{ series} ((C_2 \text{ SERIES } C_6) \text{ parallel} (C_3 \text{ parallel} C_4 \text{ parallel} C_5))$

$C_1 \text{ series} (C_2 C_6 / (C_2 + C_6) \text{ parallel} (C_3 + C_4 + C_5))$

$C_1 \text{ series} (C_2 C_6 / (C_2 + C_6) + C_3 + C_4 + C_5)$

$3 \text{ series} (11 * 3 / (14) + 3 + 5 + 6)$

$3 \text{ series} (16.357)$

equivalent capacitance = $3 * 16.357 / (3 + 16.357) = 2.535 \mu\text{F}$

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