Exercise 1

Determine the effective capacitance of the following capacitance circuit and find the voltage across each capacitance if the voltage across the points a and b is 300 V.

\[ \begin{align*} C_1 &= 18 \ \mu F \\ C_2 &= 5 \ \mu F \\ C_3 &= 4 \ \mu F \\ C_4 &= 2 \ \mu F \\ C_5 &= 6 \ \mu F \\ C_6 &= 1 \ \mu F \end{align*} \]

[Ans. 8 \ \mu F., \ 100V,200V,200V,200V,200V,100V]

Exercise 2

Two parallel, infinite plates made of material of perfect conductor, carry charges \( Q_1 \) and \( Q_2 \). The plates have finite thickness. Show that the charge densities on the two adjacent inside surfaces are equal and opposite while that on the two outside surfaces are equal.

(Hint : Field inside the plates due to four charged surfaces must be zero.)