

Q8

$$N_{opt} = \ln\left(\frac{CL}{C_0}\right) = \ln\left(\frac{10 \times 10^{-12} \text{F}}{100 \times 10^{-15} \text{F}}\right) \approx 4.605$$

$$\beta_4 = \left(\frac{CL^{1/n}}{C_0}\right) = \left(\frac{100 \times 10^{-12}}{100 \times 10^{-5}}\right)^{1/4} = 3.162$$

$$N=4 = (A_0) \cdot A_0 + \beta^2 A_0 + \beta^3 A_0 = A_0 - 45.765$$

$$\beta_5 = \left(\frac{10 \times 10^{-12}}{100 \times 10^{-5}}\right)^{1/5} = 2.512$$

$$A_5 = A_0 + \beta A_0 + \beta^2 A_0 + \beta^3 A_0 + \beta^4 A_0 = 10^{-6} 5.441$$

$N=4$ smaller area, smaller capacitance

