

## Homework 5 - Aidan Sharpe

### Problem 1

If the gate oxide thickness in a SiO<sub>2</sub>-based structure is 2[nm], what would be the thickness of an HfO<sub>2</sub>-based dielectric providing the same capacitance?

$$k_{\text{SiO}_2} = 3.9$$

$$k_{\text{HfO}_2} = 20$$

$$2[\text{nm}] \frac{20}{3.9} = \boxed{10.26[\text{nm}]}$$

### Problem 2

Using the SUBM rules, calculate the minimum uncontacted and contacted transistor pitch.

#### Uncontacted

$$\lambda + 3\lambda + \lambda = \boxed{5\lambda}$$

#### Contacted

$$\lambda + 2\lambda + 2\lambda + 2\lambda + \lambda = \boxed{5\lambda}$$