TFE 4152 Design of Integrated Circuits

Exercise 2

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Contents

Problem 1

From the problem text, we are given this information:

Table 1: NMOS Transistor Parameters in 180 nm Technology

Parameter	Unit/Equation	Value
V_{eff}	V	0.2
V_{Drain}	V	0.2
V_{Source}	V	0
W	μm	0.5
L	μm	0.2
T	K	293
μC_{OX}	$\frac{\mu\text{A}}{\text{V}^2}$	270
V_{t0}	V	0.45
$\lambda \cdot L$	$\frac{\mu m}{\text{V}}$	0.08
C_{OX}	$\frac{\text{fF}}{\mu\text{m}^2}$	8.5
t_{OX}	nm	5
n	-	1.6
θ	$\frac{1}{\text{V}}$	1.7
m	-	1.6
$\frac{C_{OV}}{W} = L_{OV}C_{OX}$	$\frac{fF}{\mu m}$	0.35
$\frac{C_{db}}{W} \approx \frac{C_{sb}}{W}$	$\frac{fF}{\mu m}$	0.5

a) What can you say about the region of operation for the transistor, based on the description above?

Based on the description above we can use

Problem 2

Problem 3

Problem 4