

EE 236 Lab Report Basic Electronic Devices

Experiment No. 8

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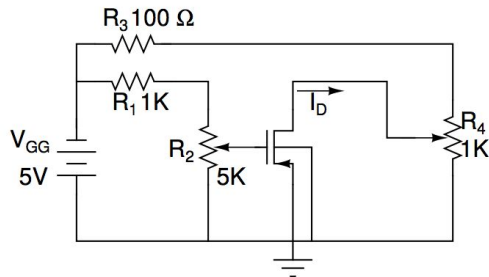
Batch:Monday

Name of TA/RA :Arindam Sarkar

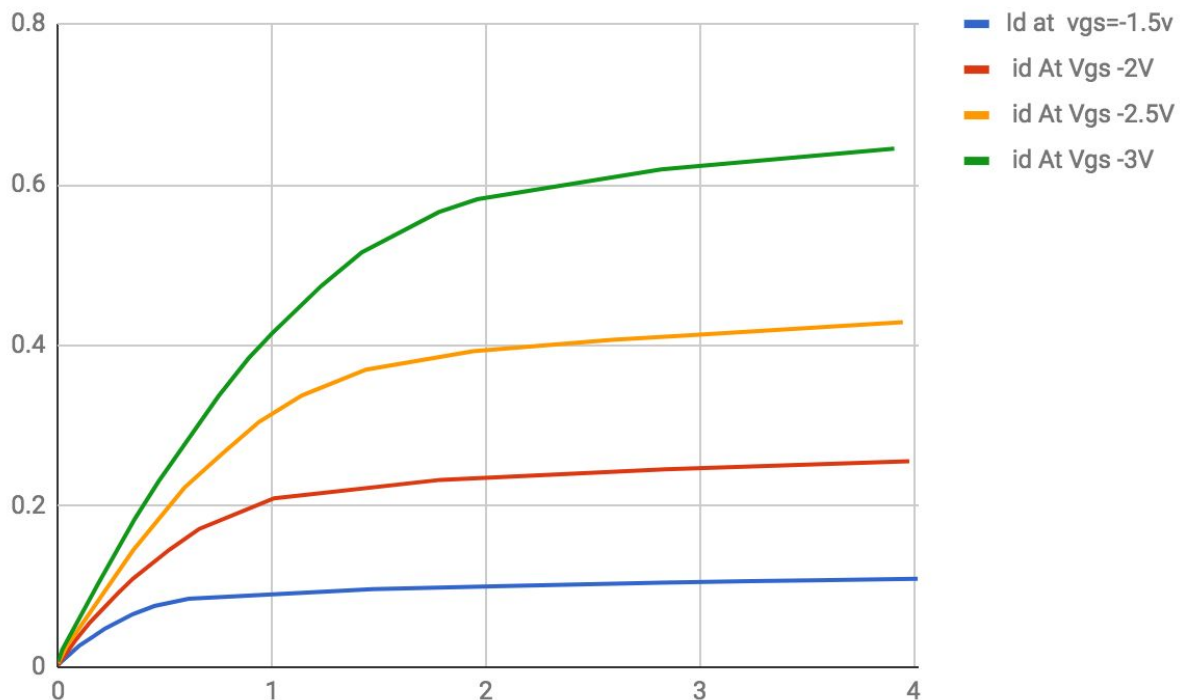
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Part 1



Draw an I_D v/s V_{DS} plot for different values of V_{GS} . Calculate the Drain-Source resistance and the Early voltage. Is the early voltage same for both PMOS and NMOS? Why?



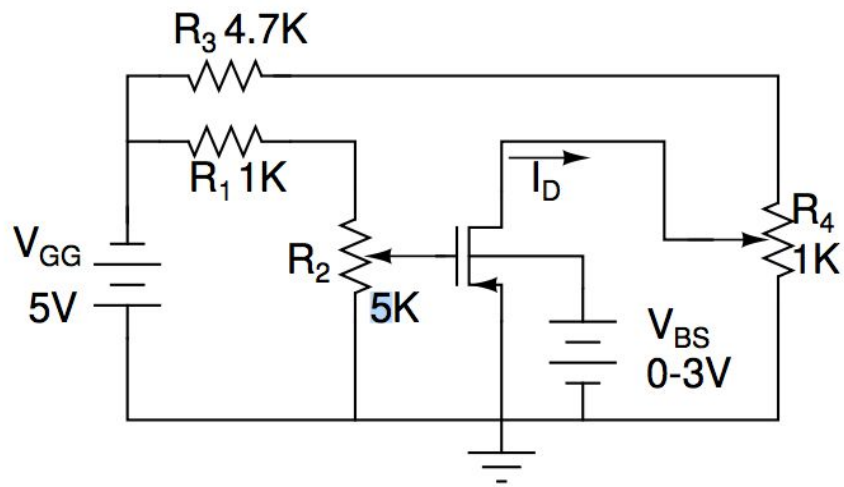
V_{gs}, early voltage is in volts and resistance is in ohm

No the value of |V_{early}| is very less in p mos compared to n mos

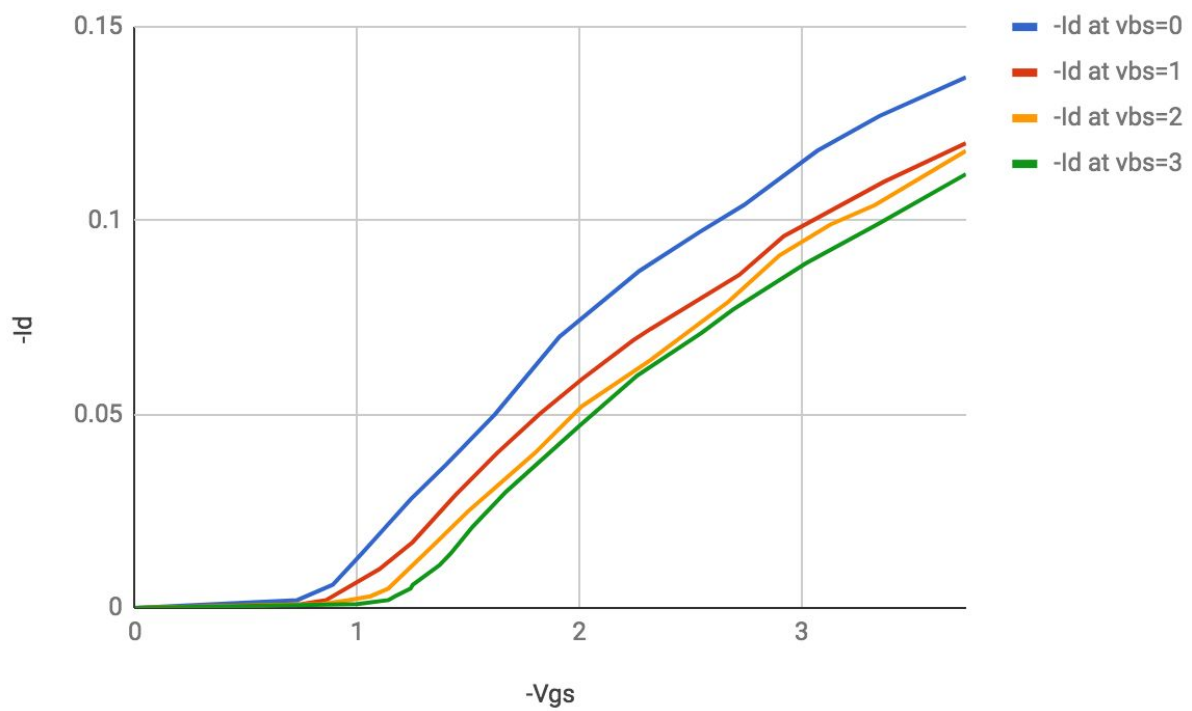
This is due to higher value of λ in p mos which arises due to silicon wafers which are p substrate.

| vgs | Drain-Source resistanc | Early voltage |
|------|------------------------|---------------|
| -1.5 | 5.151515152 | 22.38 |
| -2 | 3.506493506 | 22.18 |
| -2.5 | 2.605042017 | 21.87 |
| -3 | 2.085889571 | 21.65 |

Part 2



1. Plot I_D - V_{GS} characteristic for each value of body bias V_{BS} .

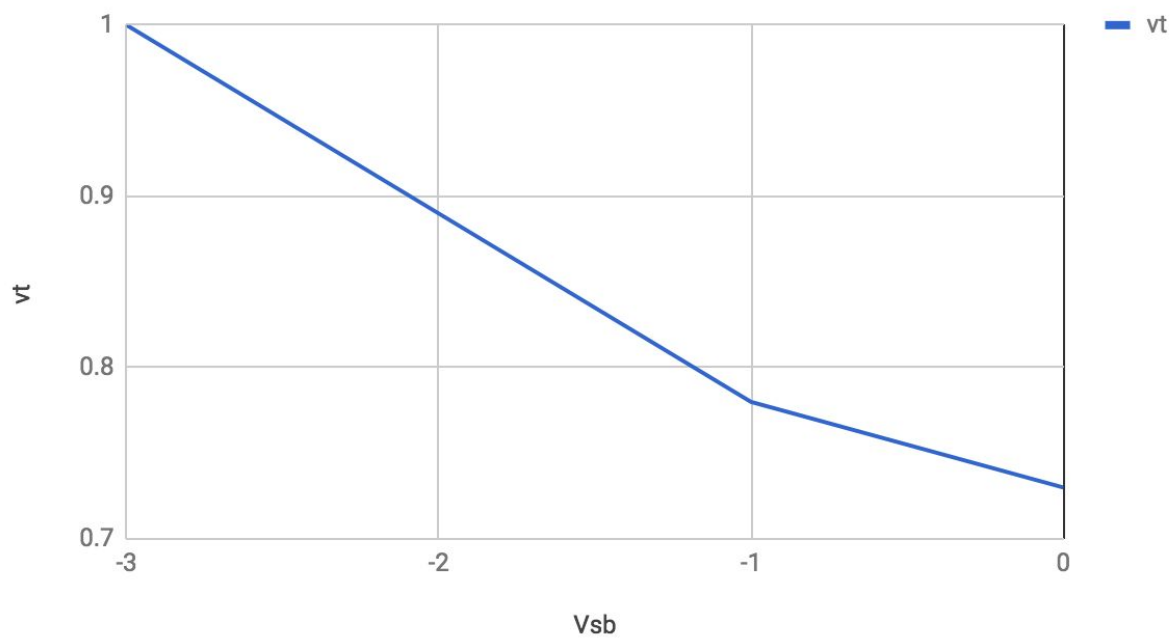


2. Obtain threshold voltage for each value of V_{BS} .

| Vsb | vt |
|-----|------|
| 0 | 0.73 |
| -1 | 0.78 |
| -2 | 0.89 |
| -3 | 1 |

3. Plot V_t v/s V_{bs} You should get four points.

vt vs. Vbs



4. Obtain body effect coefficient from V_t v/s V_{SB} plot.

Slope: -0.13 = body effect coefficient

