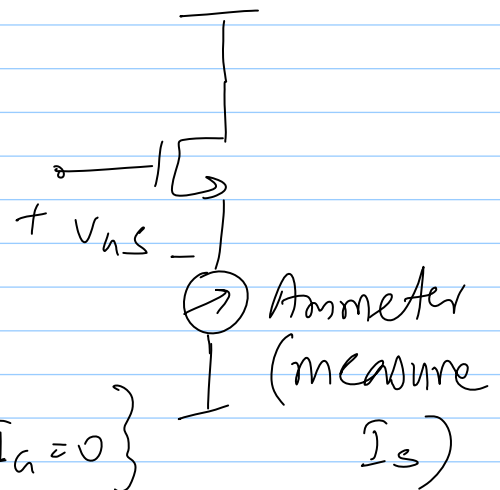
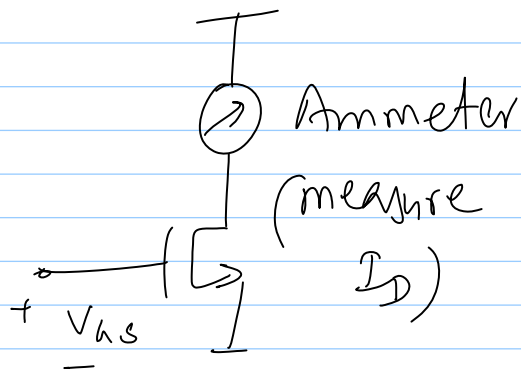


5-9-12

Lec 17

Stable Quiescent Current

- * Measure I_D (I_S)
- * Compare with I_{ref}
- * If $I_D > I_{ref} \Rightarrow$ reduce V_{DS}
- * If $I_D < I_{ref} \Rightarrow$ increase V_{DS}

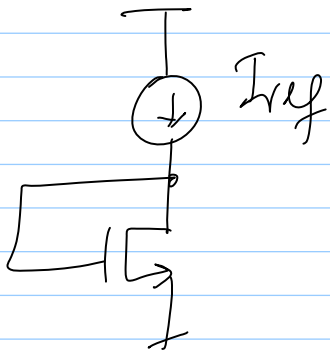


because $I_D = I_S \quad \{I_A = 0\}$

- * change $V_{DS} \Rightarrow$
 - 1) keep S fixed, vary h
 - 2) keep h fixed, vary S

$\Rightarrow$ Four ways of stabilisation

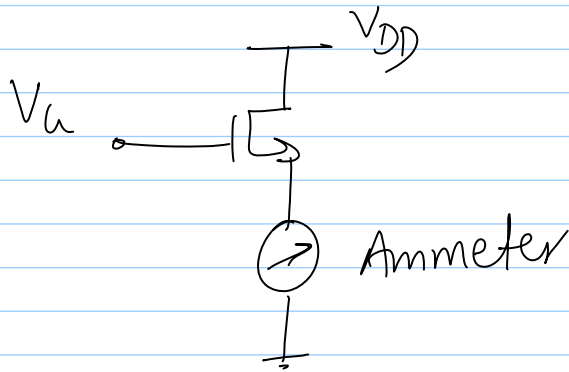
1)



measure I_D , vary V_a ,
keep V_s fixed

2)

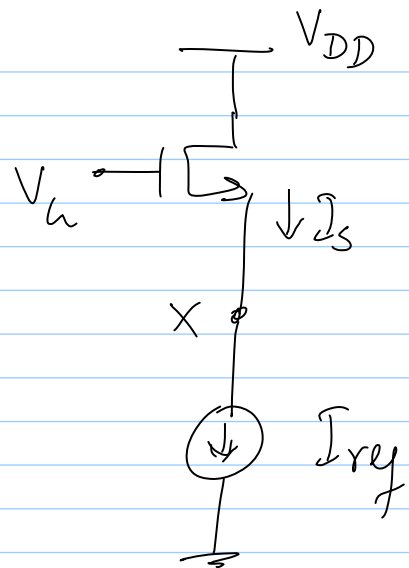
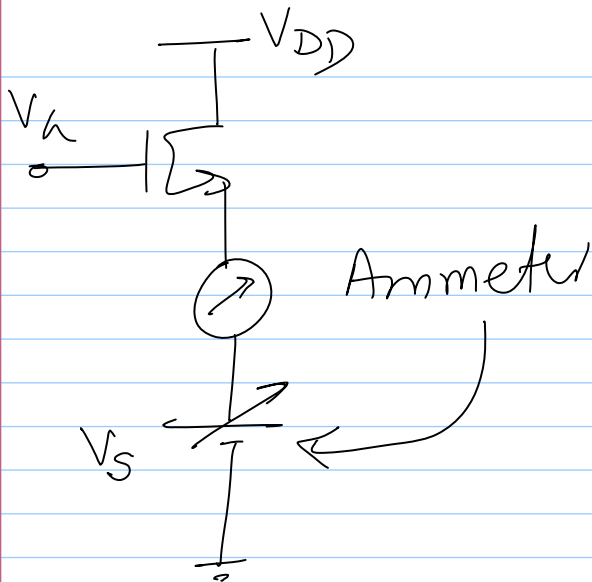
measure I_s , vary V_{as} by keeping
 V_a fixed, vary V_s



* $V_{DD} > V_a - V_T$ (sat.)

* If $I_s > I_{ref} \Rightarrow \downarrow V_{as} \Rightarrow \uparrow V_s$

* If $I_s < I_{ref} \Rightarrow \uparrow V_{as} \Rightarrow \downarrow V_s$



$I_s > I_{ref} \Rightarrow V_x \uparrow \Rightarrow V_s \uparrow \Rightarrow V_{as} \downarrow \Rightarrow I_s \downarrow$

$I_s < I_{ref} \Rightarrow V_x \downarrow \Rightarrow V_s \downarrow \Rightarrow V_{as} \uparrow \Rightarrow I_s \uparrow$