

Q1: In an NMOS, what is the name given to the minimum gate voltage for the NMOS to turn on?

↑ Threshold Voltage

Q2: Once the gate voltage is above the minimum value described in Q1, how does increasing the gate voltage affect the drain current?

$V_{GS} \uparrow$ no. of $e^- \uparrow$ conductivity $\uparrow$ resistivity $\downarrow$ $I_D \uparrow$

Q3: If V_{GS} is above the value described in Q1 and kept fixed, increasing V_{DS} will cause the I_D to increase at the same rate for all values of V_{DS} .

TRUE / FALSE

Q4: Explain the difference between V_{DS} and v_{ds} in a MOSFET amplifier.

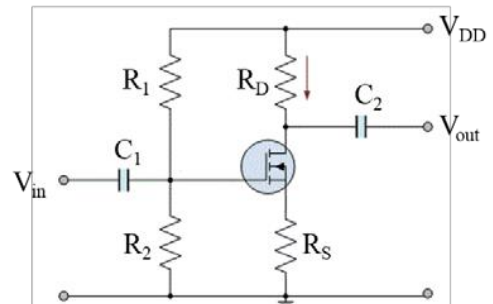
$\rightarrow V_{DS} = v_{DS} + V_{GS}$

Q5: In the small signal equivalent circuit of an FET amplifier, DC voltage sources in the circuit should be replaced with what?

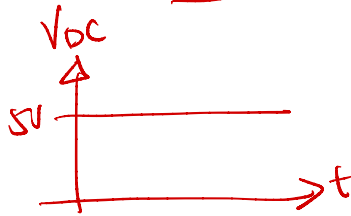
large signal short-circuit

Q6: For the circuit on the right, given $R_1 = R_2 = 100k\Omega$, $R_D = 2k\Omega$, $R_S = 400\Omega$, $V_{DD} = 10V$, $I_D = 10\text{mA}$, and I_D assume r_o is infinite:

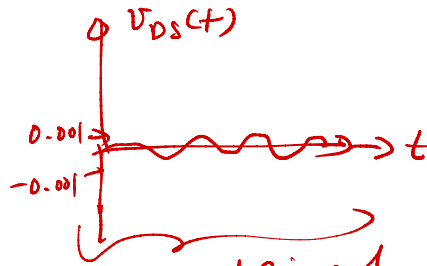
- Find V_{GS} and V_{DS} Draw the small signal equivalent circuit and hence determine the gain of the amplifier. (4.2V)
- Find the input res Draw the small signal equivalent circuit and hence determine the gain of the amplifier. (-4V)
- Find the input resistance in the passband. (50K Ω)



$$v(t) = V_{DC} + v_{DC}(t)$$



+



small signal analysis

