EE2005 Score: /10

Student ID:_____ Student Name:_____ Group: _____

Q1: In an NMOS, what is the name given to the minimum gate voltage for the NMOS to turn on? 1 Mark

Q2: Once the gate voltage is above the minimum value described in Q1, how does increasing the gate voltage affect the drain current? 1 Mark

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 1 Mark

Q3: Explain the difference between V_{DS} and v_{ds} in a MOSFET amplifier. 1 Mark

Q2: In the small signal equivalent circuit of an FET amplifier, DC voltage sources in the circuit should be replaced with what? 1 Mark

Q3: For the circuit on the right, given $R_1 = R_2 = 100k\Omega$, $R_D = 2k\Omega$, $R_S = 400\Omega$, $V_{DD} = 10V$, $I_D = 2$ mA $g_m = 10$ mS, and assume r_o is infinite: 5 Marks

a) Find V_{GS} and V_{DS} (2 marks)
b) Draw the small signal equivalent circuit and hence determine the gain of the amplifier. (2 marks)
c) Find the input resistance in the passband. (1 mark)