EE210: Analog Electronics - Quiz 7

NAME (in capital)	Roll No

Time: 15 minutes

1) : All transistors in the figures are biased in saturation (biasing network has not been shown). Assume transconductance of $M1$ is g_{m1} and that of $M2$ is g_{m2}. Neglect CLM.

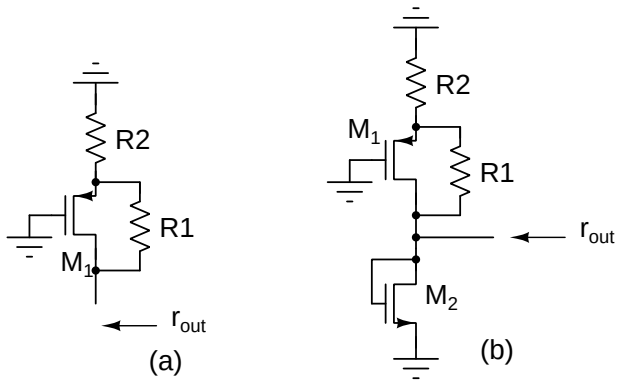
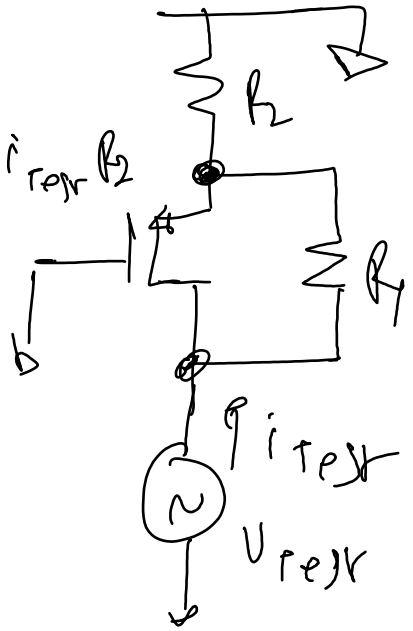


Fig. 1. Problem 1

a) : Find the small-signal output resistance as indicated in Fig. (a). **[6]**



KCL @ V_{test}

$$i_{test} = \frac{V_{test} - i_{test} R_2}{R_1} + g_{m1}\left(0 - i_{test} R_2\right)$$

$$\Rightarrow \frac{V_{test}}{i_{test}} = R_1 + R_2 + \left(g_{m1} R_1\right) R_2$$

$$= R_{out\,1}$$

contd..

b) : Find the small-signal output resistance as indicated in Fig. (b). **[4]**