

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 M_1 is g_{m1} and that of M_2 is g_{m2} . Neglect CLM.

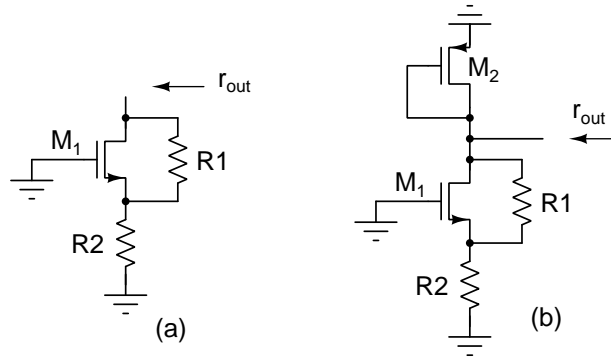
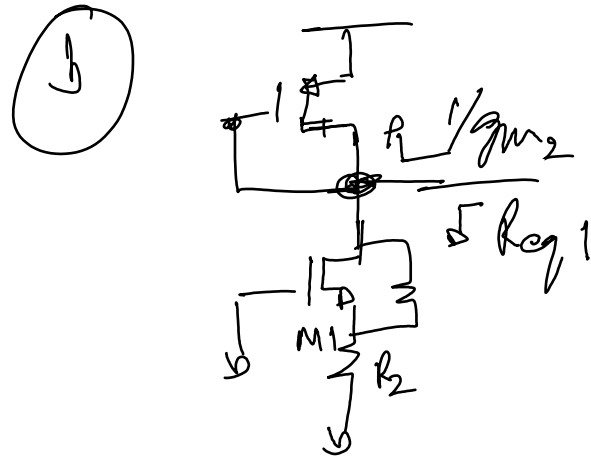
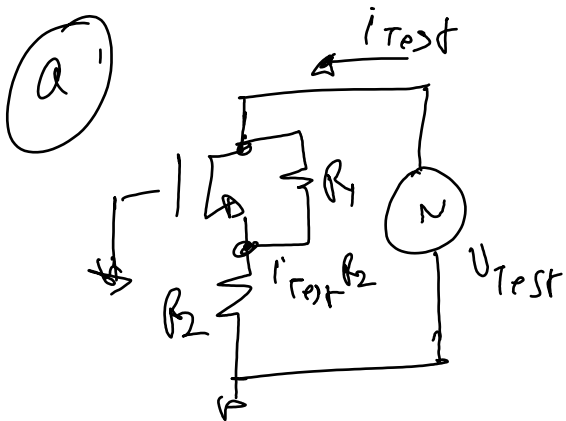


Fig. 1. Problem 1

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

[6]



KCL @ V_{Test}

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

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

$$= R_{eq}$$

$$R_{eq1} = R_1 + R_2 + (g_{m1} R_1) R_2$$

$$\therefore R_{eq} = \frac{1}{g_{m2}} \parallel R_{eq1}$$

contd..

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

[4]