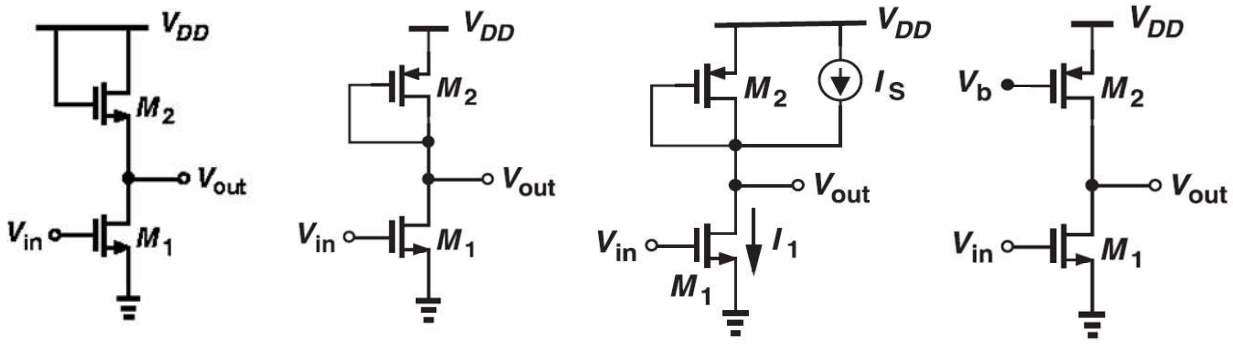
Introduction to Analog Integrated Circuits (111), DECE, NTUST

Homework 2 (Due date: 10/05)

HW2.1: (20 points)

Using small-signal parameters to find the voltage gain and output resistance of each amplifier in Fig 2.1 (*channel length modulation* and *body effect* cannot be ignored).



(a) (b) (c) (d)

Fig. 2.1

HW2.2: (20 points)

Using small-signal parameters to derive the output resistance (Rout) in Fig. 2.2.

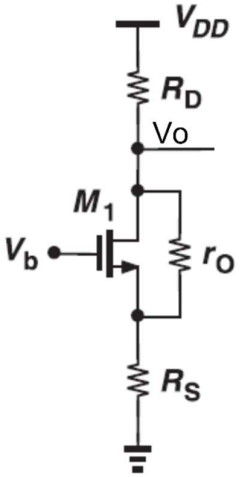


Fig. 2.2

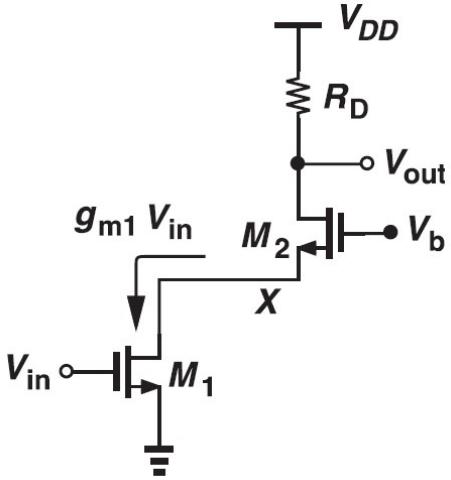


Fig. 2.3

HW2.3: (30 points)

Fig. 2.3 shows a common-gate circuit.

(a) If we define a minimum output voltage, Vout,min, how do you find out the valid input range of Vin?

(b) Calculate the voltage gain and output resistance.

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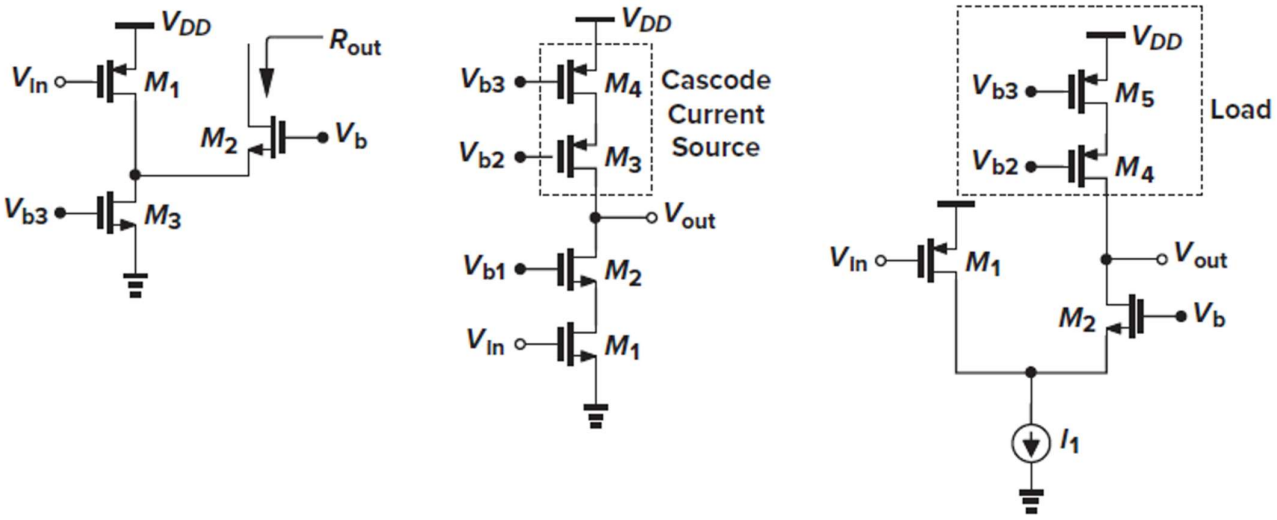
HW2.4: (30 points)

Calculate the voltage gain and output resistance of circuits in Fig. 2.4.

Note: Fig. 2.4(a) only needs to calculate the output resistance.



(a) (b) (c)

Fig. 2.4