Homework 1

ECE 5/413 – Radio Frequency IC Design

The following problems are intended to review analog circuits material from the pre-requisite courses.

Problem 1: Find small-signal voltage gain ($A_v = \frac{v_{out}}{v_{in}}$) of the amplifier stages shown in Fig. 1 in terms of transistor small-signal parameters (g_{m1}, g_{m2}, r_{o1}, r_{o2}, etc.) and circuit parameters (R_s, R_D, etc.). Here, V_{b1}, V_{b2}, etc., are DC bias voltages. Assume that all transistors are in saturation.

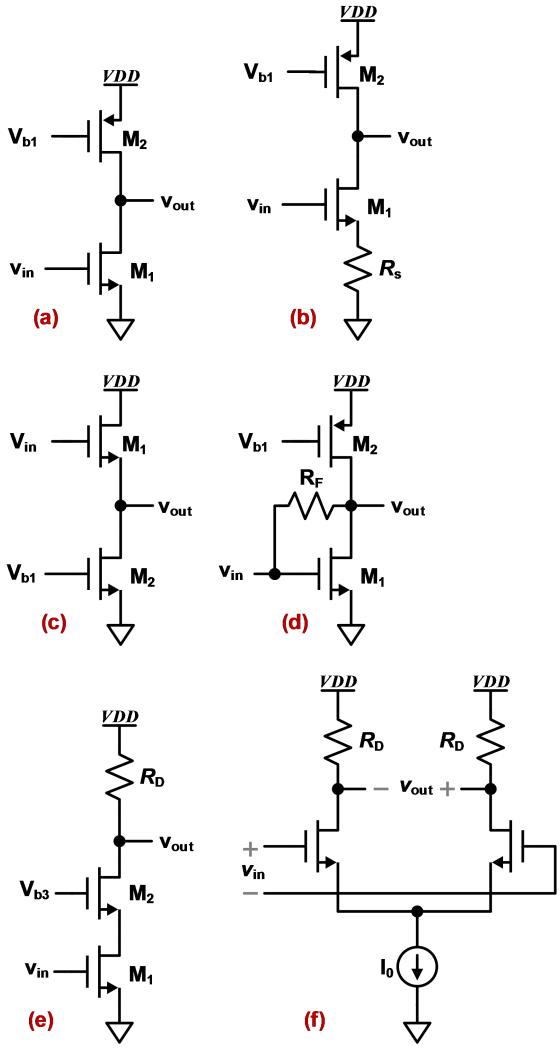

Figure 1