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303 Fall 2008 – Midterm Exam Makeup – Take Home

Due in class Tuesday 11/18/08;

Open book open notes; all work your own which your signature guarantees

Maximum points:

a) 10 if greater than 65 was obtained on the midterm

b) 70 maximum for the total of midterm + midterm-makeup if less than 66 was obtained on the midterm

1. (up to 25 points) A given transistor circuit has the (normalized) transfer function

$[Vo(s)/Vi(s)] = T(s) = 5(s^2-4s+3)/(s^2+4s+3)$

a) Give the zeroes and poles of T(s) and plot them in the s-plane

b) If, for $-\infty < t < +\infty$, $vi(t)=0.03e^{(j2t)}$ give vo(t).

c) Using the result of b) give vo(t) when vi(t)=0.03sin(2t).

2. (up to 25 points) The following is an equivalent circuit for a source follower as a 2-port for which the 2x2 admittance matrix Y(s) is desired.

a) Find Y(s).

b) From Y(s) give the input resistance V1(s)/I1(s) under open circuit load conditions, that is, when I2=0. Repeat to find, also when I2=0, the transfer function T(s) = V2(s)/V1(s).