Examination Feedback for EEE335 – Integrated Electronics
Spring Semester 2015-16

Feedback for EEE335 Session: 2015-2016

General Comments:

Question 1:

Most people did this question and it was reasonably-well attempted. In part b, some people still get mixed up with what to invert and how to interpret switch state/logical state. Part e was the least-well answered part of the questions. People did not recognize that an undershoot on the output could forward bias the substrate pn junction. Nor did they identify that a possible solution is to use bigger diodes with a smaller Vf to limit excursions of the voltage

Question 2:

This is a relatively standard question (with more bookwork than Q1) and very few people did it. Those who did so generally did quite well.

Question 3:

Part a: descriptions of the three terms was poor. It was not enough to simply state formulae for the terms.
Part b: students did well with the calculations in section I and the small signal model in section ii. In section iii some workings were required to gain full marks, and some students stated the wrong formula (that of a source follower) and ended up with a gain ~1!
Part c: all sorts of odd arrangements of transistors and connections were tried here, marks were awarded when two PMOS devices were shown back to back, with connected gates, and with the reference arm shown 'diode connected'.

Question 4:

Part a: most students could suggest a current mirror as an alternative to the potential divider for biasing, but descriptions as to why this was better were lacking. Marks were given for talking about feedback, temperature dependence of transistor operation, physical space on the IC substrate…
Part b: small signal modelling was fine. Full marks required describing assumptions in section ii – e.g. that the parasitic capacitances could be considered open circuits at midband frequencies. Most students got the Miller capacitances correctly, and could describe where they would connect. Again, in section iv, assumptions needed to be stated to gain full marks – e.g. that the gain at the cutoff frequency is approximately equal to the midband gain.