Student Name:

Student ID:

Date: 20/12/2012

EHB262E Electronics II
Quiz 2

1) Please circle TRUE if you think that the statement is true; FALSE otherwise.

   a. Current sources preferably have **low** small signal output resistances.
   TRUE / FALSE

   b. Consider a differential amplifier with **shorted inputs**. The small signal gain of this amplifier is the common-mode gain of the differential amplifier.
   TRUE / FALSE

   c. Differential amplifiers preferably have **high** CMRRs.
   TRUE / FALSE

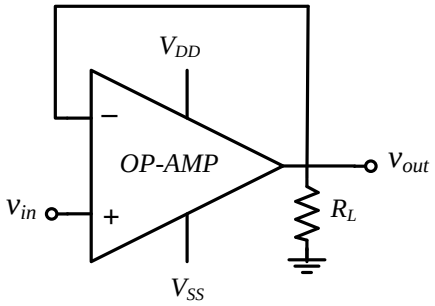
   d. OP-AMP based buffers are achieved by shorting the OP-AMP's output with its **positive** input.
   TRUE / FALSE

   e. In Spice, if a circuit needs to be investigated in **time** domain then transient analysis should be performed.
   TRUE / FALSE

2) Consider a voltage follower (buffer) shown below. Ideally, the output v_{out} of the buffer should follow the input v_{in} precisely; $v_{out} = v_{in}$. However, this is not the case in real world; there is always an error. Suppose that the error ε of a buffer is defined as

$$\varepsilon = \left| \frac{v_{out} - v_{in}}{v_{in}} \right|.$$

   Find the minimum value of R_L such that the error does not exceed 0.01 (1%). The OP-AMP has infinite input resistances, an output resistance of 1kΩ, and a gain of 100.



Grading: 1) 50% (10% each), 2) 50%

Duration: 15 minutes