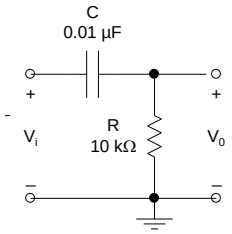
ESC201 Lab Quiz Sample Questions

- Each question is a multiple-choice type question. More than one options may be correct for a question.
- You will get either full marks or zero marks in each question. There will be no partial marking.
- To get the full marks in a question, you have to select all the correct options and only the correct options.

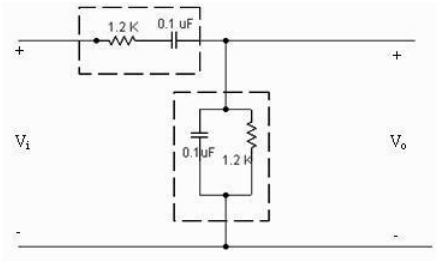
1. To measure the output resistance R_S of a function generator (FG) producing a 10 kHz 5 V pk-pk sine wave, one measures the open circuit voltage to be V_{OC}, and then connects a known resistance R_L across the terminals of the FG and measures the voltage across R_L to be V_L. The output resistance R_S is given by
- ☐ $R_S = R_L*(V_{OC}+V_L)/V_L$.
- ☐ $R_S = R_L*(V_{OC}-V_L)/V_L$.
- ☐ $R_S = R_L*(V_{OC}/V_L)$.
- ☐ None of the above.

2. The circuit shown on right is a good integrator for a square wave of time period T, when (where τ is the associated time constant)



- ☐ $T >> \tau$.
- ☐ $T \approx \tau$.
- ☐ $T << \tau$.
- ☐ None of the above.

3. The circuit shown in the figure on right will work as a

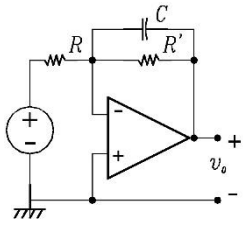


- ☐ low pass filter.
- ☐ high pass filter.
- ☐ band pass filter.
- ☐ band stop filter.

4. Consider the experiment in which the I-V characteristics of normal diode and Zener diode are measured with the help of a difference amplifier circuit. The output of the difference amplifier used in the diode I-V characterization experiment represents the current in mA with 1:1 scaling setting for the oscilloscope probe, because
- ☐ a difference amplifier always measures the current in mA for the 1:1 scaling setting for the probe.
- ☐ the difference amplifier is actually measuring the current through the 1 kΩ resistor.
- ☐ the difference amplifier is actually measuring the voltage difference across the 1 kΩ resistor.
- ☐ none of the above.

5. Which of the following statements are true for an ideal op-amp?
- ☐ The op-amp has infinite input impedance.
- ☐ The op-amp has infinite output impedance.
- ☐ The op-amp is infinite open-loop voltage gain.
- ☐ The op-amp has infinite bandwidth.

6. Consider the op-amp circuit shown on right. Without the feedback resistor R′,



- ☐ the circuit will behave like a differentiator if input offset voltage is zero.
- ☐ the circuit will behave like an integrator if input offset voltage is zero.
- ☐ the output may saturate to either $+V_{SAT}$ or $-V_{SAT}$ if input offset voltage is nonzero.
- ☐ the output may oscillate between $+V_{SAT}$ and $-V_{SAT}$ if input offset voltage is nonzero.