

The following lab quiz was given last year to ECE 113A Fall 2002 students.

Please keep in mind that the lab quiz for fall 2003 year might be completely different in style, content, difficulty, etc.

1A	1B	1C	2A	2B	2C	2D	3	Tot.
/10	/10	/10	/10	/10	/15	/15	/20	/100

THREE PROBLEMS TOTAL.

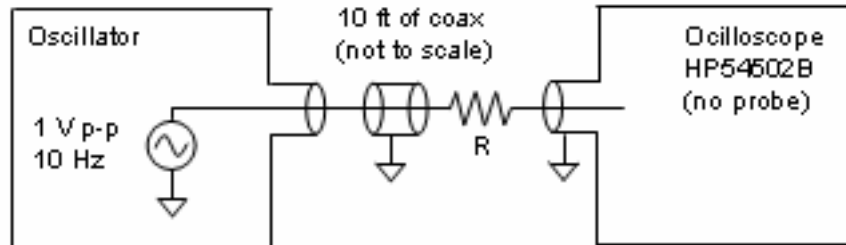
**DO NOT BEGIN THE QUIZ
UNTIL YOU ARE TOLD TO
DO SO.**

**NEXT WEEK IN DISCUSSION SECTION,
AFTER EXAM IS GRADED AND
RETURNED TO YOU,
ASK T.A. IMMEDIATELY (IN 15 MINUTES
OF GETTING IT) IF YOU HAVE
QUESTIONS ABOUT HOW YOUR EXAM
WAS GRADED. ANY LATER QUESTIONS
WILL BE “TOO LATE” AND WILL NOT
BE CONSIDERED.**

In the following, if you do not get the correct amplitude to within 10%, no partial credit will be given whatsoever.

(Don't even ask.)

PROBLEM ONE: (30 points)



For the following, be careful: You need to take into account the scope input impedance, which forms a voltage divider with R. (The oscillator has zero output impedance. The voltage indicated is the actual voltage generated by the oscillator.)

A) (10 points)

$R = 1 \text{ k}\Omega$.

Sketch the waveform displayed on the scope (voltage vs. time). No units (both horizontal and vertical axis), no credit.

B) (10 points)

$R = 1 \text{ M}\Omega$.

Sketch the waveform displayed on the scope (voltage vs. time). No units (both horizontal and vertical axis), no credit.

C) (10 points)

$R = 10 \text{ M}\Omega$.

Sketch the waveform displayed on the scope (voltage vs. time). No units (both horizontal and vertical axis), no credit.

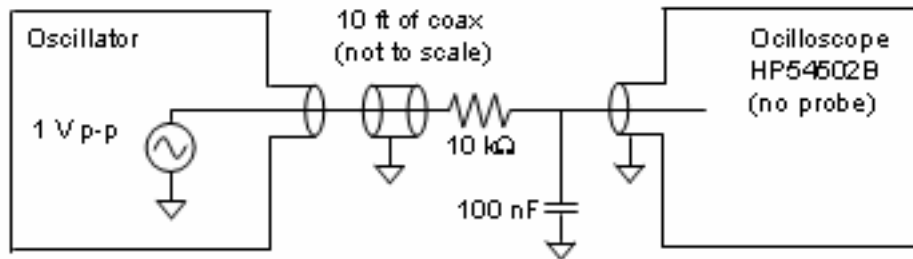
You must write your answer within the space provided on the following page.

Write your answer to PROBLEM ONE on this page:
You must write your answer within the space provided.

A)

B)

C)

PROBLEM TWO: (40 points)

(The oscillator has zero output impedance. The voltage indicated is the actual voltage generated by the oscillator.)

A) (10 points)

Does the input impedance of the scope matter in this circuit to within 10%? (Yes or no).

B) (10 points)

Does the cable capacitance change the frequency response of this circuit more than 10%? (Yes or no).

Hint: The cable capacitance is typically 20 pF/foot.

C) (15 points)

For the oscillator, $f = 10$ Hz.

Sketch the waveform displayed on the scope (voltage vs. time). No units, no credit. (Neglect cable capacitance.)

D) (15 points)

For the oscillator, $f = 0.159$ kHz.

Sketch the waveform displayed on the scope (voltage vs. time). No units, no credit. (Neglect cable capacitance.)

You must write your answer within the space provided on the following page.

Write your answer to PROBLEM TWO on this page:
You must write your answer within the space provided.

A)

B)

C)

D)

PROBLEM THREE: (20 points)

The applied voltage to a p-n diode in series with a $10\text{ k}\Omega$ resistor is switched instantaneously from $+2.5\text{ V}$ to -2.5 V . If a storage time of $2\text{ }\mu\text{s}$ was observed, what is the minority carrier lifetime?

You must write your answer within the space provided on the following page.

ECE113AL Fall 2002 **Lab Quiz**

Name: _____

12-2-2002

ID no.: _____

Sec.B: Peter Burke 10:00 to 10:50 am

Write your answer to PROBLEM THREE on this page:
You must write your answer within the space provided.