363

EE 292.2
Electrical Engineering Lab I
Instructors: A. Dinh, D. Teng

MIDTERM EXAMINATION

Date: March 8, 2006

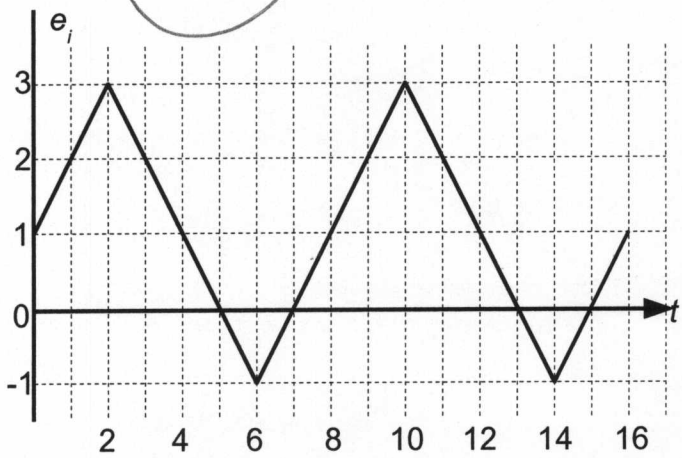
Name: Craig Bloch-Hansen
Stud. #: 147742
Group # : 3

11

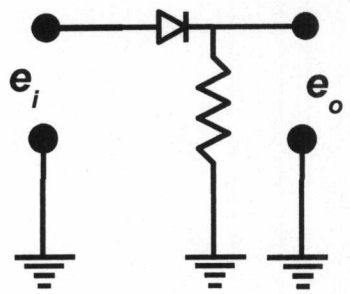
1. Diode Circuit, Diode and BJT characteristics:

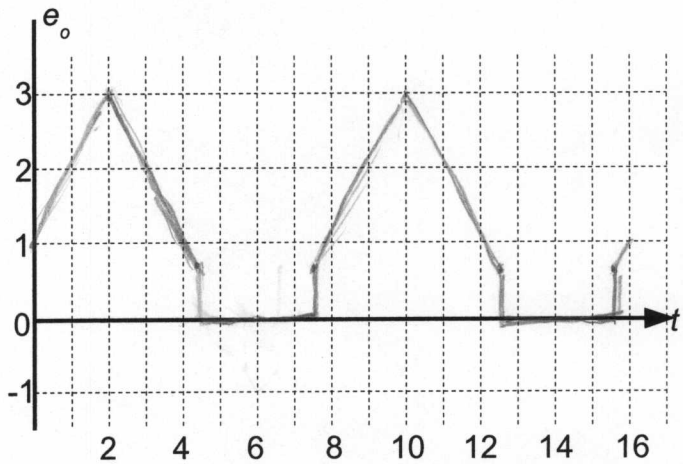
a)

Sketch the output waveform, e_o, for each of the diode circuits shown below when the input waveform, e_i, is as shown at right. Assume the diodes are silicon switching type with an idealized forward biased conduction voltage drop of 0.7V and a reverse breakdown voltage greater than 100V. Further, assume that R is such that the forward current specifications of the diodes are not exceeded.

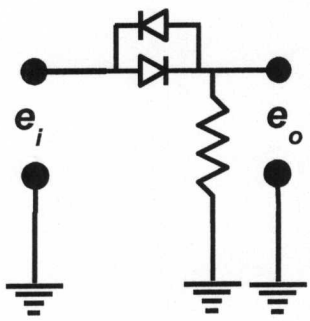


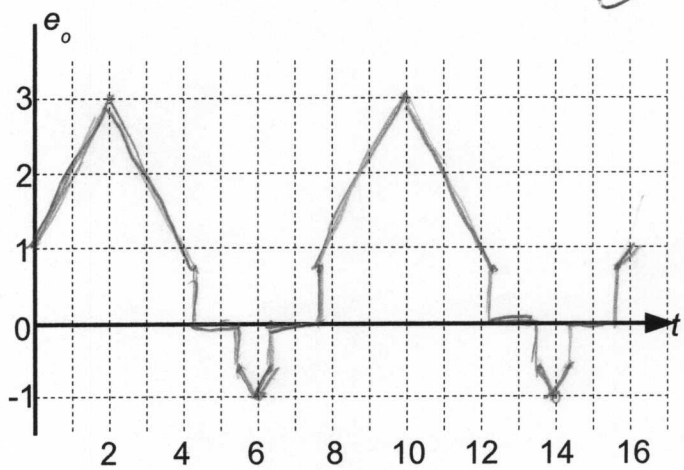
i)





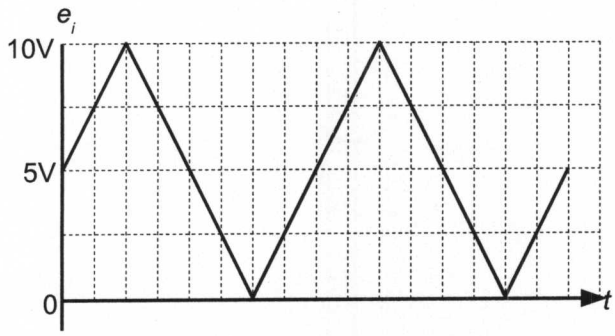
ii)

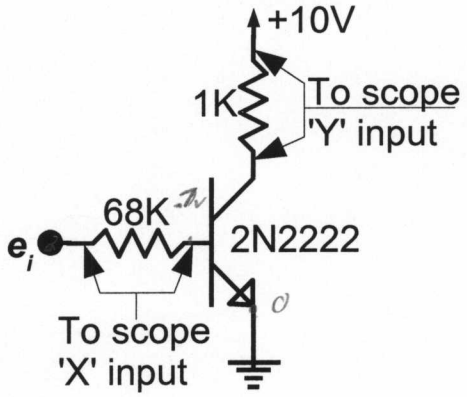




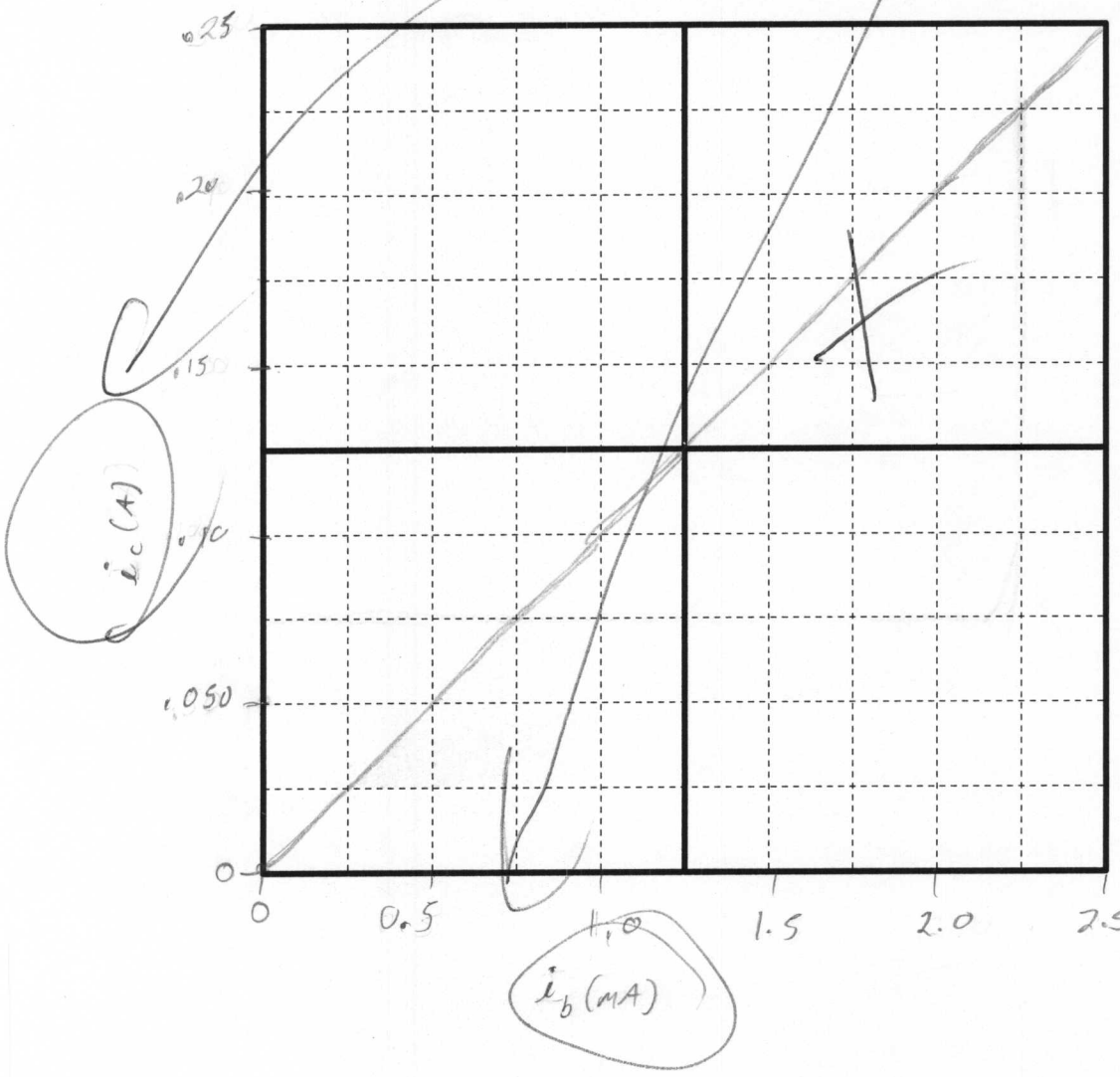
b)

The input waveform shown below is used to drive the 2N2222 transistor circuit shown at right.





Two differential input attenuators are used to sense the voltages across the base (68K) and collector (1K) resistors and are connected to the 'X' and 'Y' inputs of an oscilloscope as shown. The oscilloscope is operating in "X-Y" mode, and the input sensitivity is set to display 1.0V / division for both the X and Y inputs. Assume that the transistor has a constant $\beta = 100$. Draw the expected oscilloscope display; be sure to identify all relevant points on the "oscilloscope display" below.



$i_B = \frac{9.3v}{68k\Omega} =$

$.137mA$

$i_C = \beta i_B = 100(.137mA)$

$= 13.7mA$

$i_B = \frac{4.3v}{68k\Omega} = .00633mA$

$i_C = \beta i_B = .633mA$

i_c vs i_B

for 2N2222