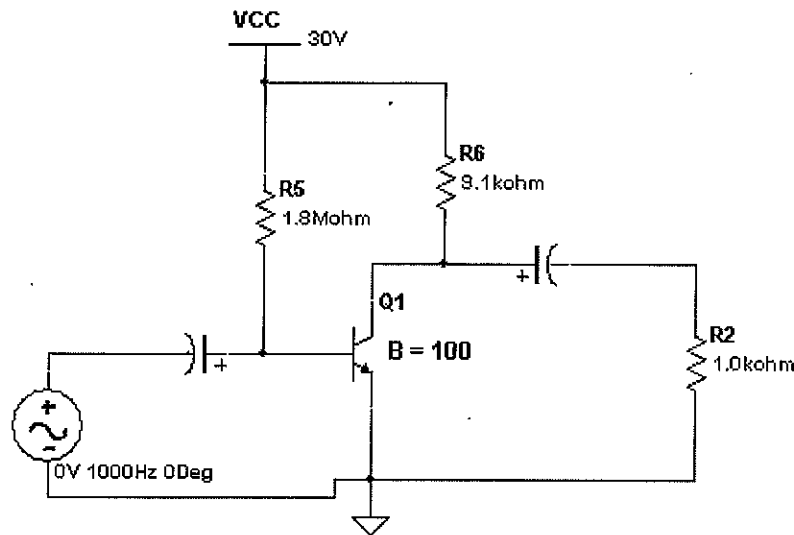


EE112 Midterm II Exam

Date: April 6, 2011

Name: _

1. From the circuit given below, find I_B , I_C , I_E , V_B , V_C , and V_E . Show your work.



72%

	Answer		Answer
I_B	$16.2 \mu A$	V_B	$.7V$
I_C	$1.6 \mu A$	V_C	$15.4V$
I_E	$1.6 \mu A$	V_E	$0V$

$$V_{RB} = 30V - .7V = 29.3V$$

$$I_B = 29.3V / 1.8M\Omega = 16.2 \mu A$$

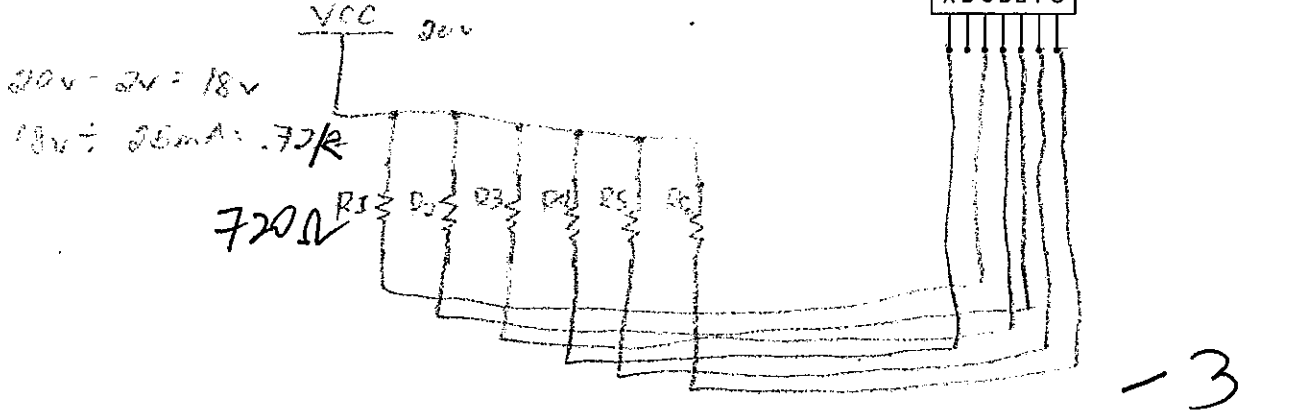
$$I_C = 100 \times 16.2 \mu A = 1.6 \mu A$$

$$V_{RC} = 1.6 \mu A \times 9.1k\Omega = 14.6mV$$

$$V_C = 30V - 14.6mV = 15.4V$$

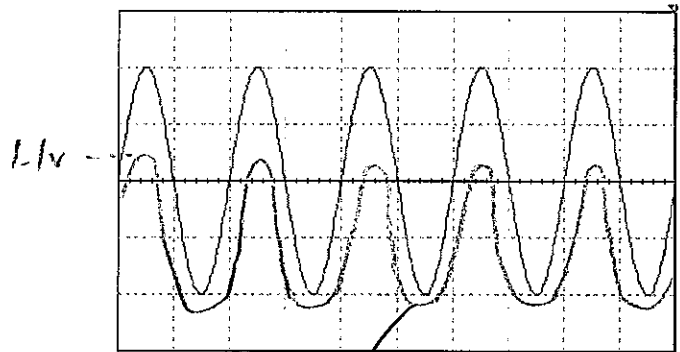
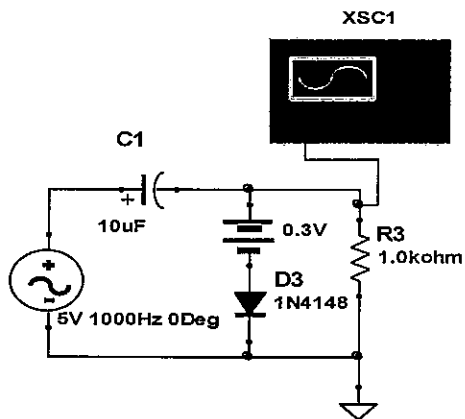
2. Design a seven segment display circuit that display the number 6.
It should meet the following conditions:

- LED current is limited to 25 mA.
- V_{cc} is 20V.
- You are using a common-anode seven segment display.

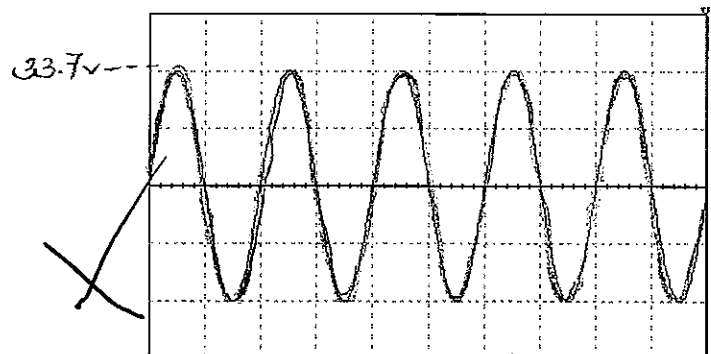
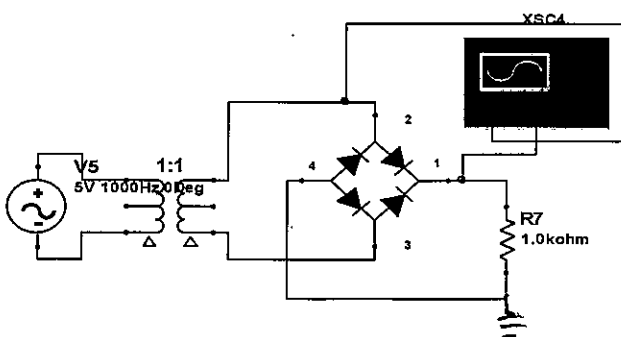


[# 3 - 8] Draw the output waveform with indication of V_p of the following circuits. (V_{in} is placed for you. Draw the output on top of it):

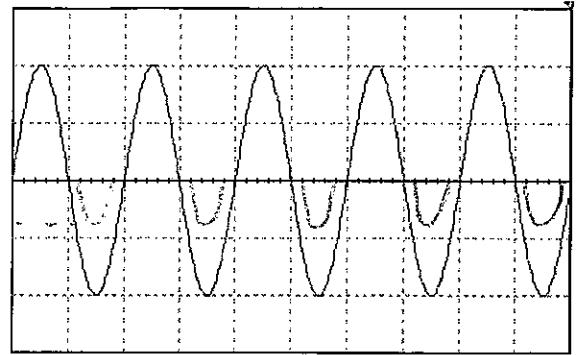
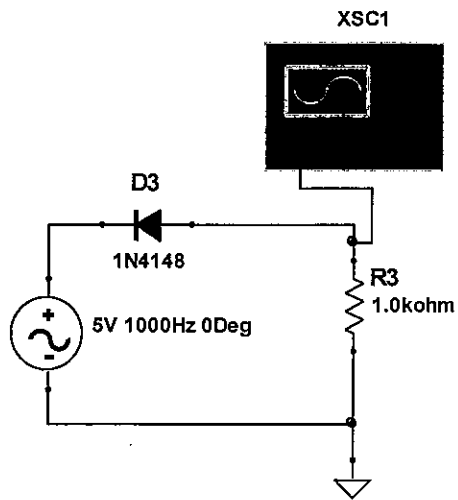
3.



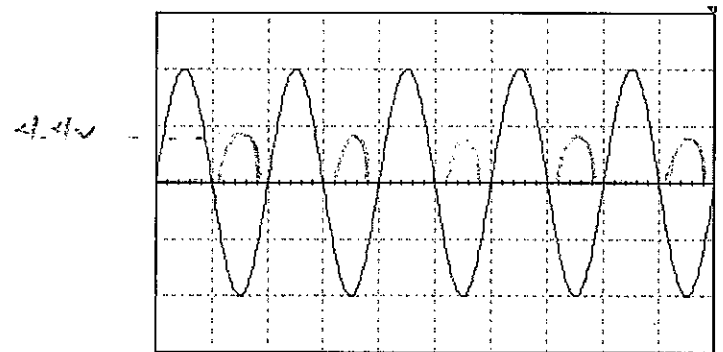
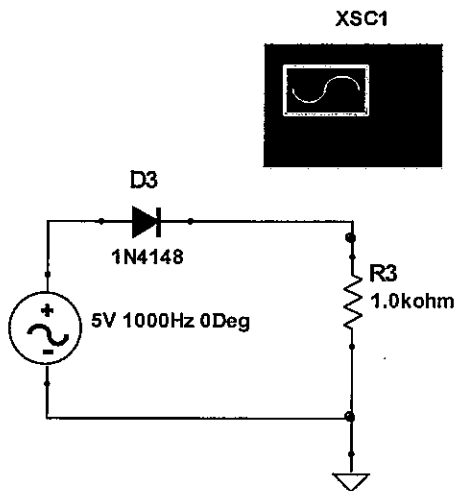
4.



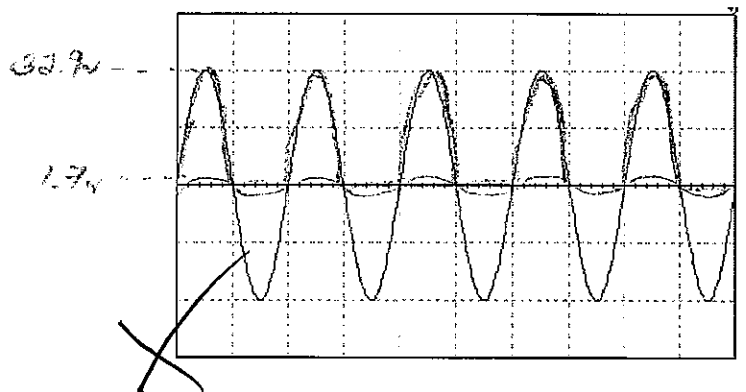
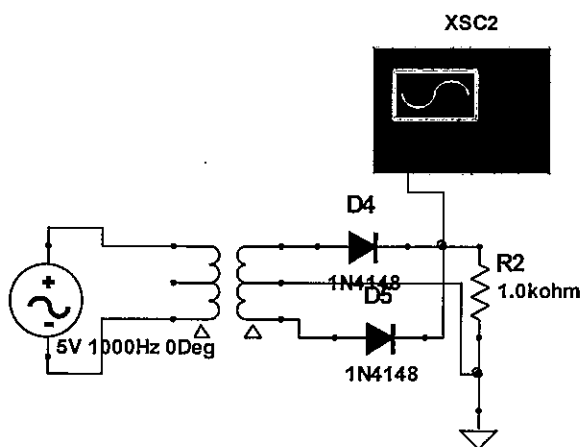
5.



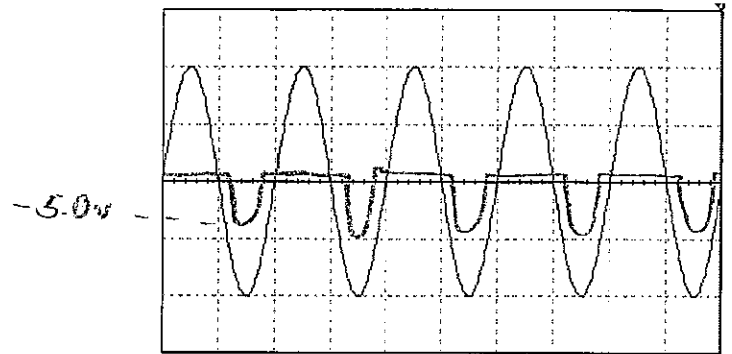
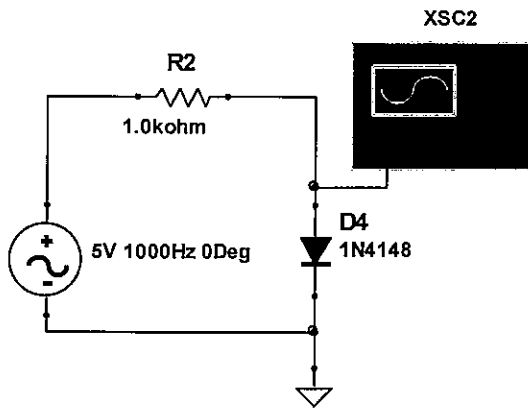
6.



7.

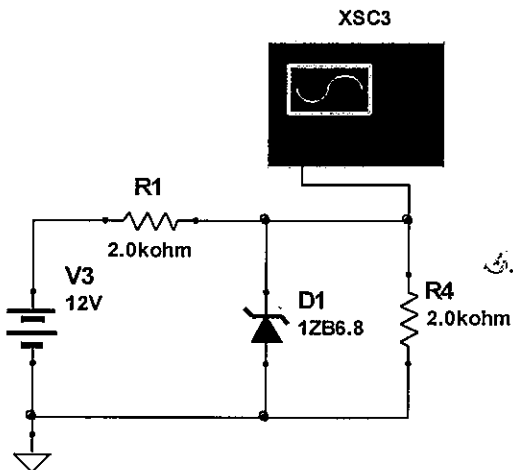


8.



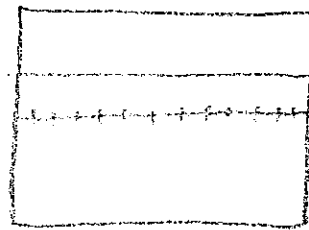
[#9 & 10] Find the output waveform for the following Zener diode circuits:

9.



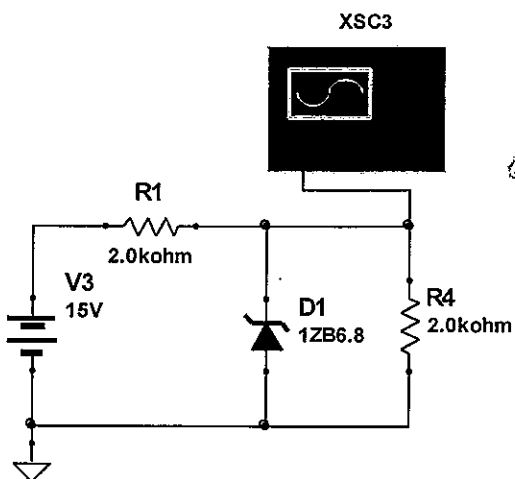
$$V_{out} = 6.9 \text{ V}$$

6.9v



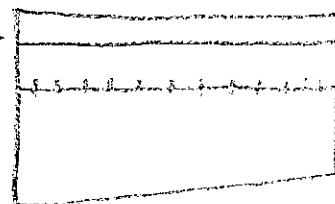
✓

10.



$$V_{out} = 6.8 \text{ V}$$

6.4v



6.8v ✓

X

+5