

ECE 322 Electronics-1, Fall 2019

Test Date: 10/23/2019

Problems: 4

Total Pages: 6

Name: _____

1. (10 points) _____

2. (20 points) _____

3. (30 points) _____

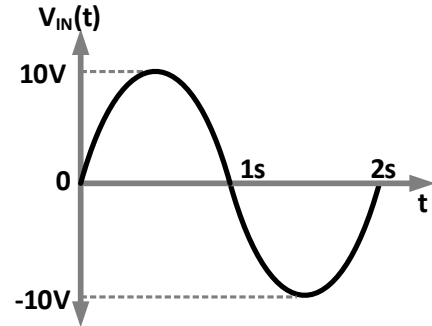
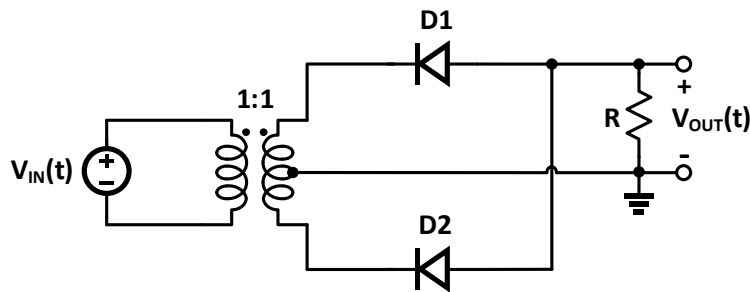
4. (30 points) _____

Total (90 points) _____

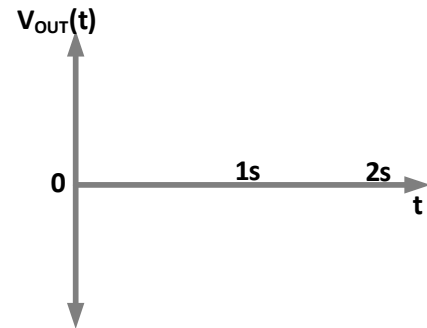
Good Luck

Problem 1: (10 points) A circuit with 2 diodes is shown below along with the waveform of the input source. Assume **ideal diodes** answer the following:

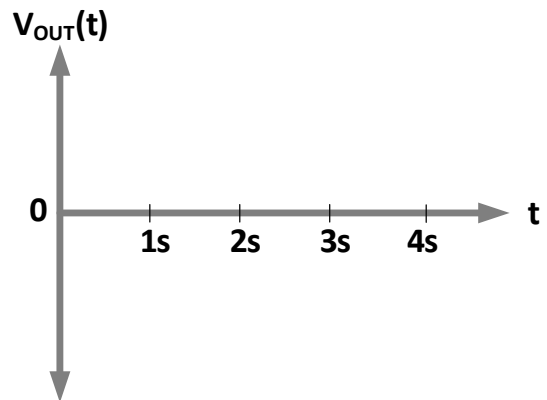
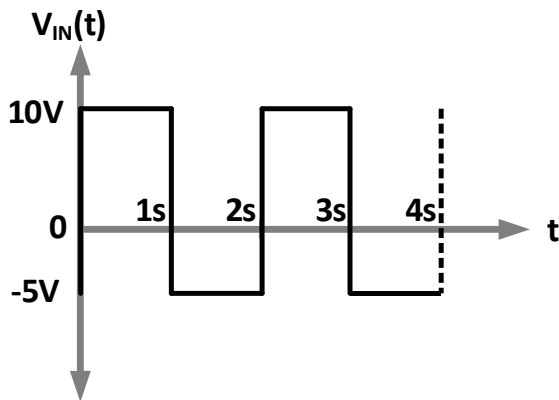
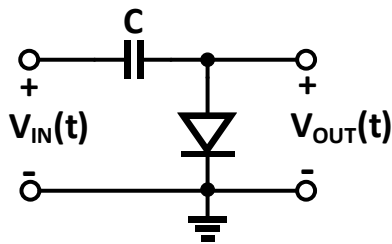
1(a) Draw V_{OUT} as a function of time and mark the peak voltage.



<p>1(b): Write the diode which is turned on during time 0s to 1s.</p>	<p>1(c): Write the diode which is turned on during time 1s to 2s.</p>
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Problem 2: (20 points) A circuit with one diode is shown below along with the waveform of the input source. Draw the output waveform $V_{OUT}(t)$. Assume the **diode is ideal**.



Problem 3: (30 points)

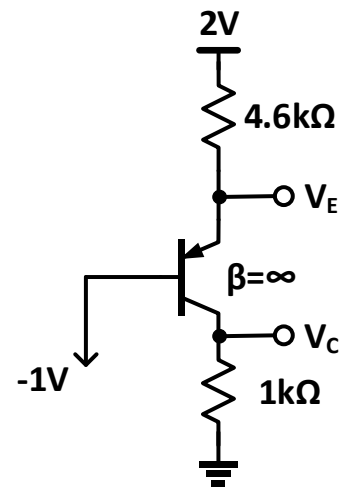
- (a) For a npn transistor, the collector current I_C is 2mA and the value of $\beta=25$.
Calculate the following quantities:

Emitter Current $(I_E) =$ _____
Base current $(I_B) =$ _____

- (b) For the circuit shown below, assume $|V_{BE}| = 0.7V$, calculate the following quantities:

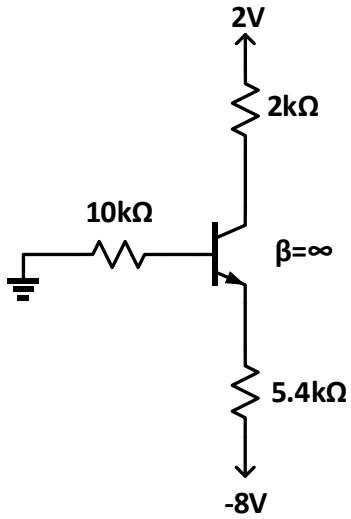
$V_C =$ _____

$V_E =$ _____



(c) For the circuit shown below, assume $|V_{BE}| = 0.7V$, determine the region of operation for the transistor (cutoff, active, or saturation)

Region of Operation = _____



Problem 4: (30 points) For the circuit shown below $|V_{BE}| = 0.7V$, calculate the following quantities:

$V_C =$ _____
 $V_E =$ _____
 $I_C =$ _____
 $I_B =$ _____
 $I_E =$ _____
 $\alpha =$ _____

