ECE 320 - Quiz #6 - Name _____

H Bridges, DC to DC Converters

H-Bridge Analysis:

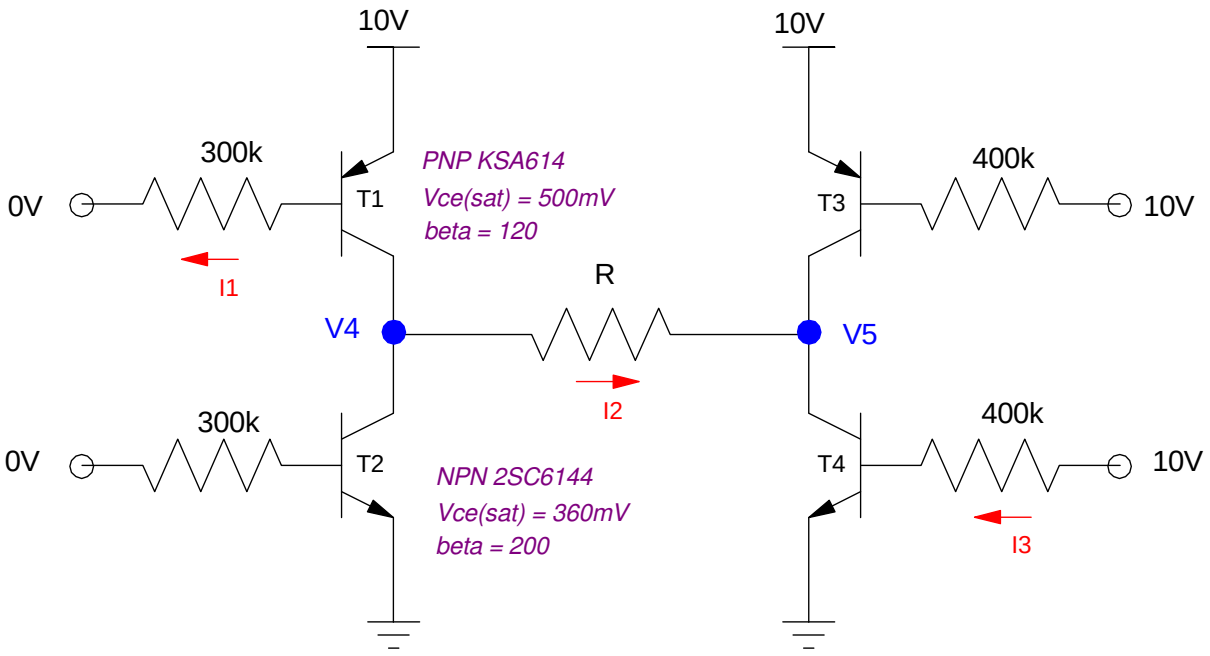
1) Determine the voltages and currents for the following H-bridge. Assume ideal transistors:

PNP (KSA614)			NPN (6144)		
| Vbe |	| Vce(sat) |	$h_{fe} = \beta$	| Vbe |	| Vce(sat) |	$h_{fe} = \beta$
700mV	500mV	120	700mV	360mV	200

Let R = 1000 + 100*(Birth Month) + Birth Day. May 14th would give R = 1514 Ohms.

Determine the voltages and currents

R 1000 + 100*mo + day	I1	I2	I3	V4	V5



H-Bridge Analysis:

2) Determine the voltages and currents for the following H-bridge. Assume ideal transistors:

PNP (KSA614)			NPN (6144)		
| Vbe |	| Vce(sat) |	$h_{fe} = \beta$	| Vbe |	| Vce(sat) |	$h_{fe} = \beta$
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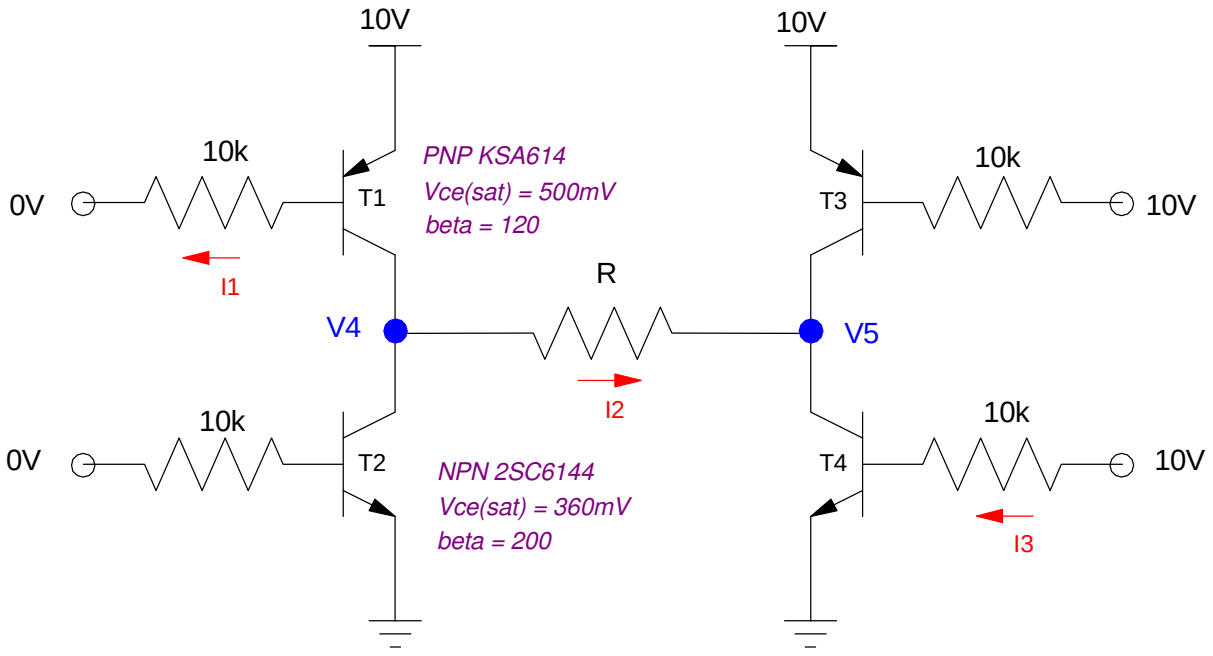
Determine the voltages and currents

R 1000 + 100*mo + day	I1	I2	I3	V4	V5

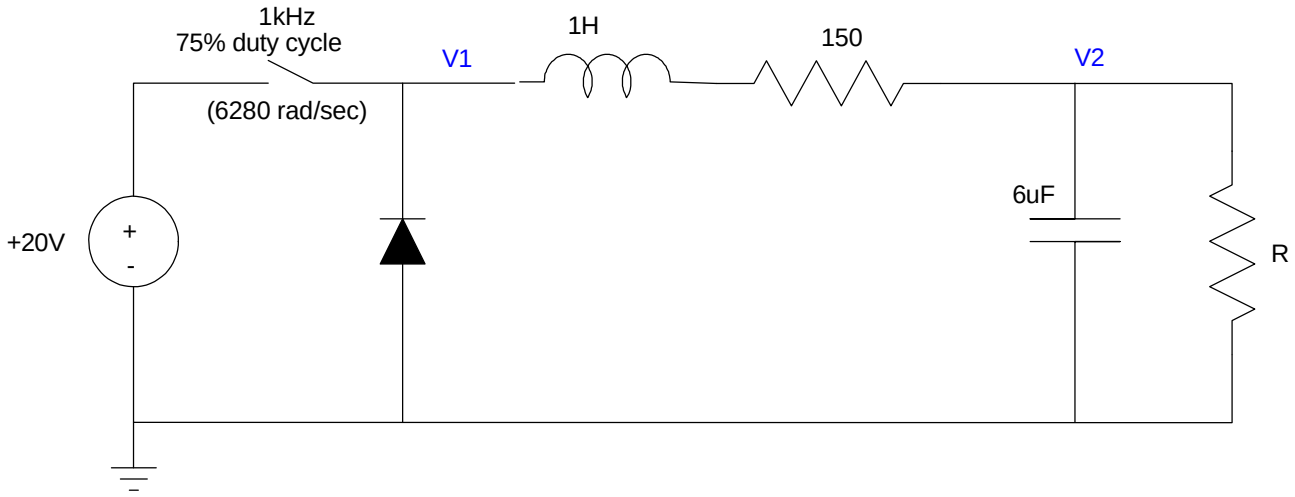


DC to DC Converter

3) Determine the voltages at V1 and V2 (both DC and AC). Assume

- R = 1000 + 100*(Birth Month) + Birth Day. May 14th would give R = 1514 Ohms.

R	V1		V2	
	V1(DC)	V1(AC)	V2(DC)	V2(AC)

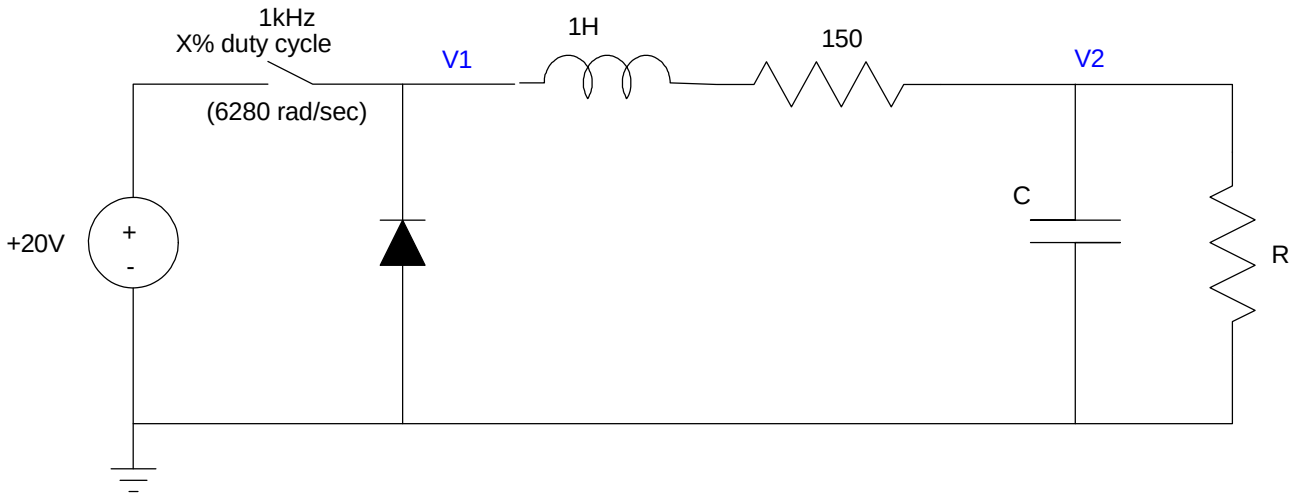


DC to DC Converter: Design

4) Determine the duty cycle and C so that

- V2(DC) is 12.50V
- V2(AC) = 1.00Vpp
- R = 1000 + 100*(Birth Month) + Birth Day. May 14th would give R = 1514 Ohms.

X% (duty cycle) V2(DC) = 12.50V	C V2(AC) = 1.00Vpp	R 1000 + 100*Mo + Day

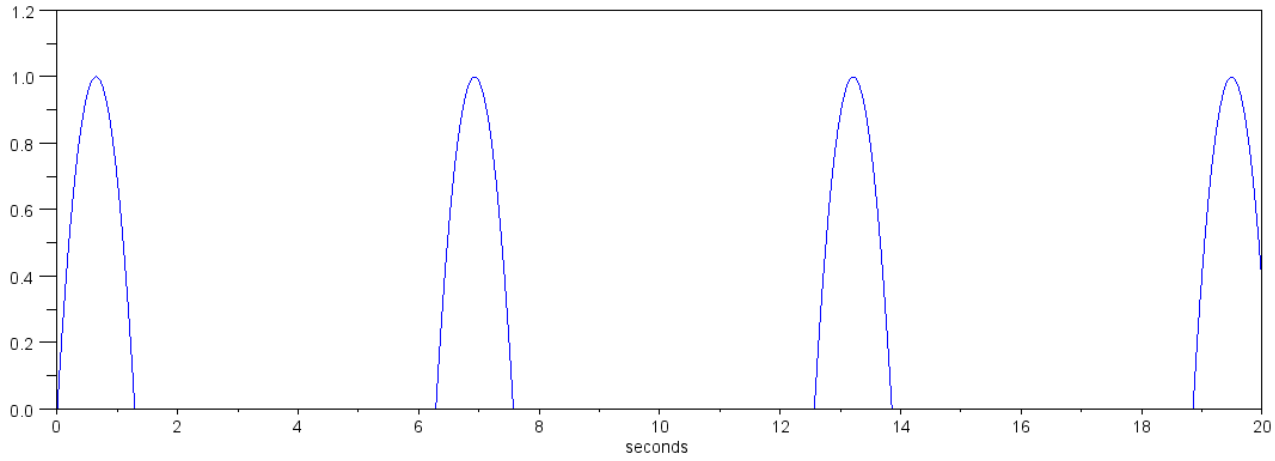


Fourier Transform

5) (Matlab recommended) Determine the DC term and the first two harmonics for the following waveform

$$x(t) = \max(0, 3\sin(t) + 4\cos(t) - 4)$$

$$x(t) \approx a_0 + a_1\cos(t) + b_1\sin(t) + a_2\cos(2t) + b_2\sin(2t)$$



Fourier Transform

6) Determine y(t) given that

- $x(t) = 10 + 6\sin(200t) + 7\cos(400t)$
- R = 1000 + 100 * (your birth month) + (your birth date).