ECE 320 - Quiz #6 - Name _____

H Bridges, DC to DC Converters, Fourier Transforms

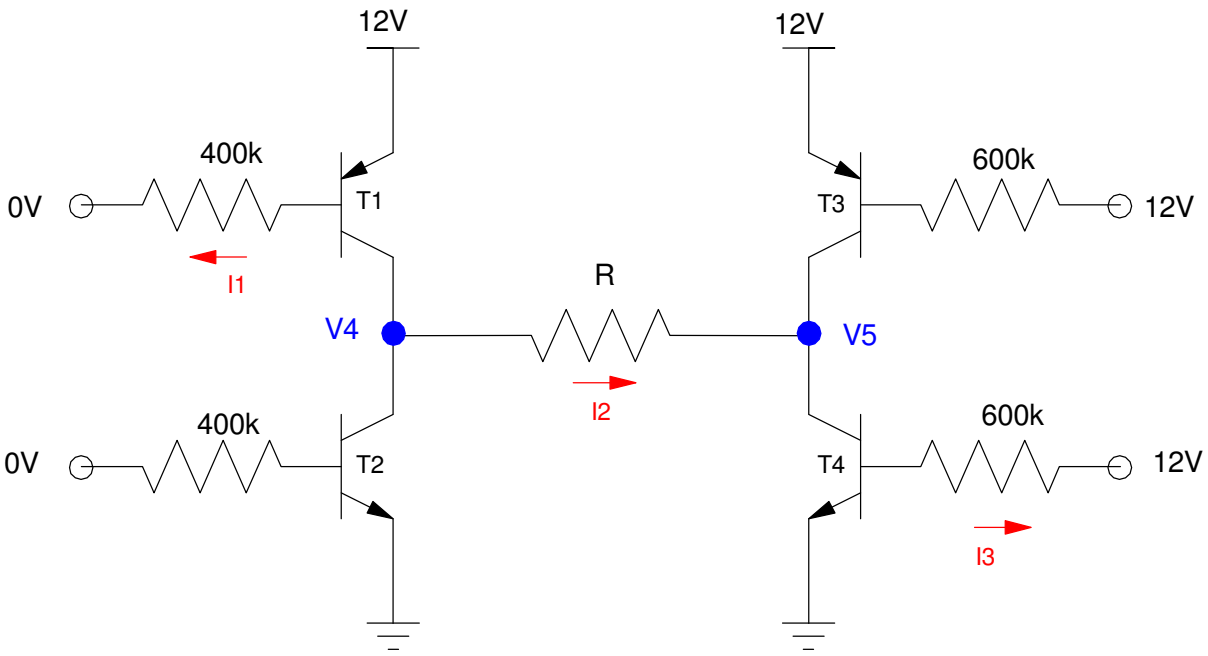
H-Bridge Analysis:

1) Determine the voltages and currents for the following H-bridge. Assume ideal 3904 & 3906 transistors:

- | Vbe | = 0.7V
- | Vce | = 0.2V when saturated
- Current gain = β = 100

Let R = 900 + 100*(your birth month) + (your birth date)

R 900 + 100*mo + day	I1	I2	I3	V4	V5

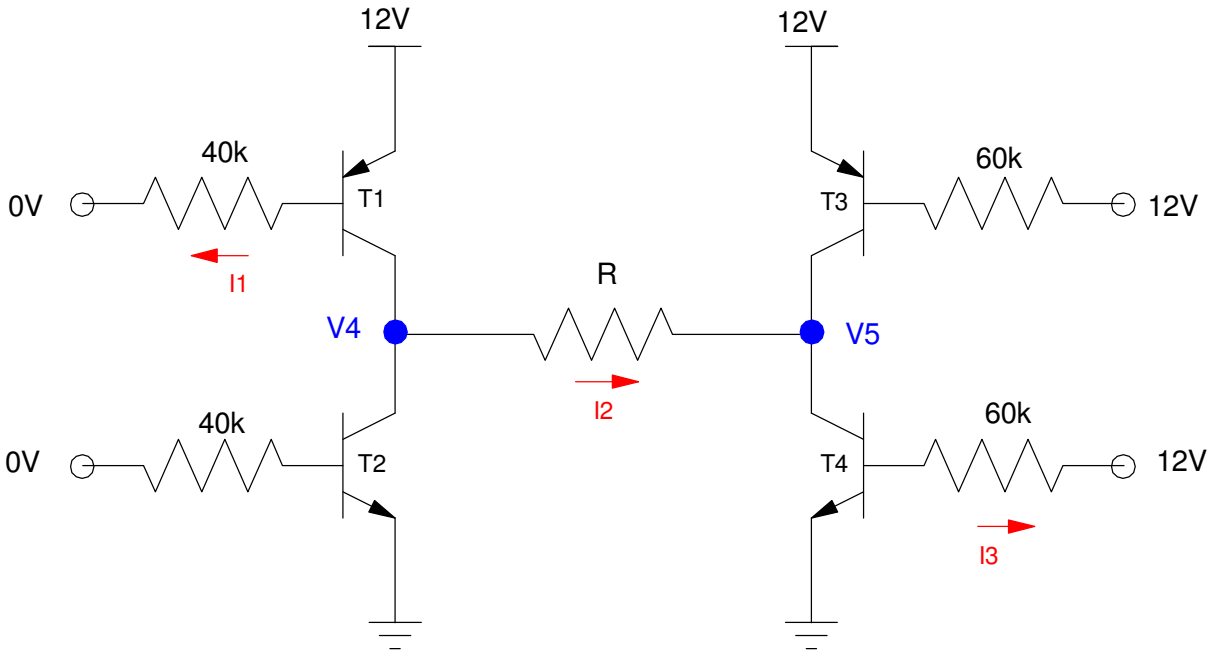


H-Bridge Analysis:

2) Determine the voltages and currents for the following H-bridge. Assume ideal 3904 & 3906 transistors:

- | Vbe | = 0.7V
- | Vce | = 0.2V when saturated
- Current gain = beta = 100

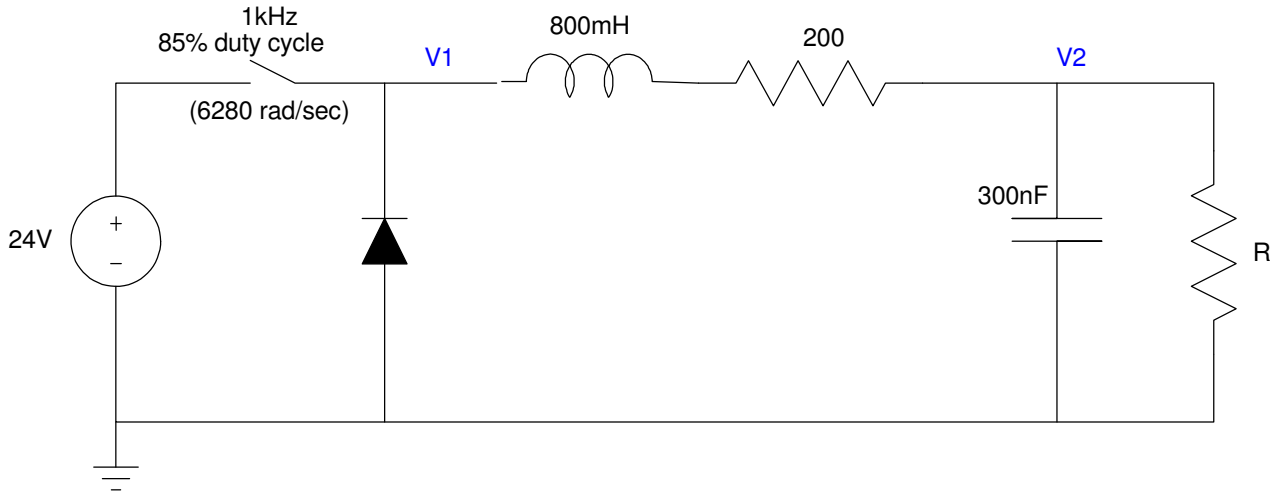
R 900 + 100*mo + day	I1	I2	I3	V4	V5



DC to DC Converter: Analysis (note: 24V DC power supply)

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

R 900 + 100*mo + day	V1		V2	
	DC	AC (V1pp)	DC	AC (V2pp)

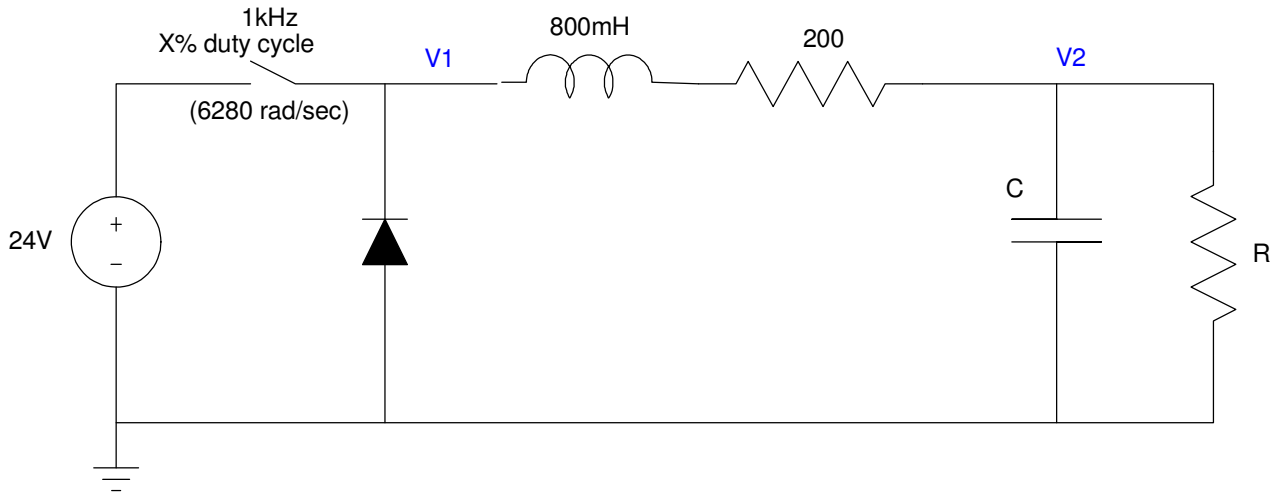


DC to DC Converter: Design (note: +24V DC power supply)

4) Determine the duty cycle and C so that

- V2(DC) is 7.50V and
- V2(AC) = 350mVpp

R 900 + 100*mo + day	Duty Cycle (X) %	C

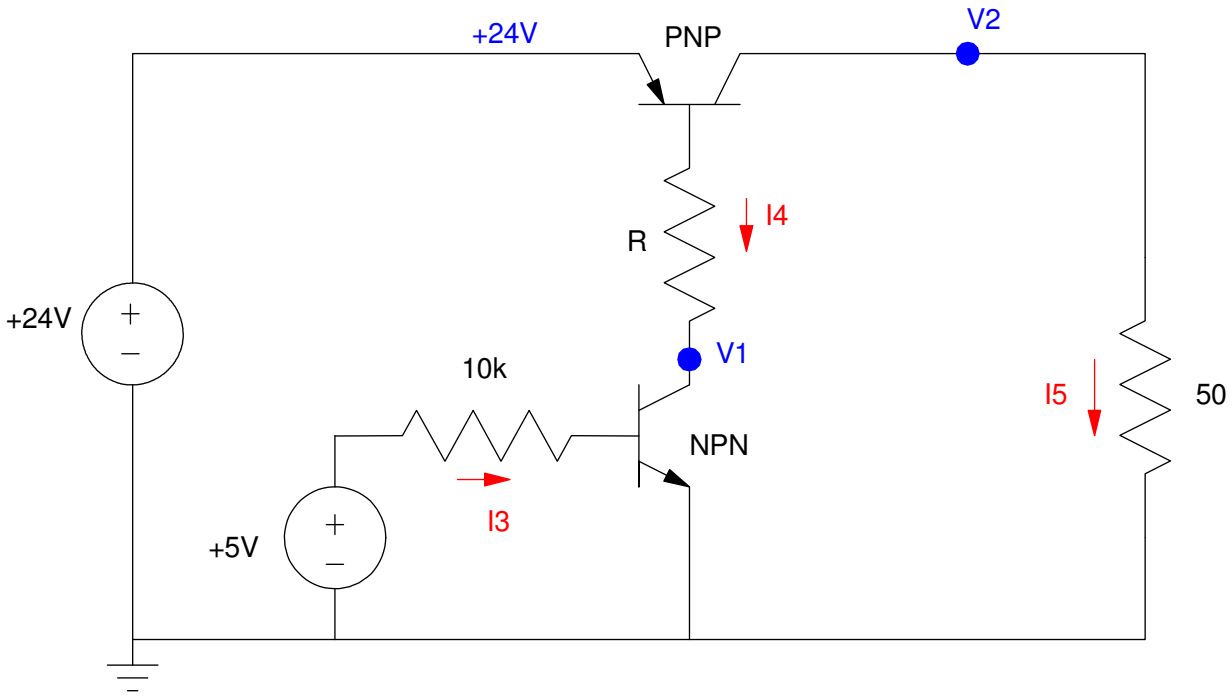


DC to DC Converter

5) Determine the voltages and currents for the following DC to DC converter. Assume ideal 3904 & 3906 transistors:

- | Vbe | = 0.7V
- | Vce | = 0.2V when saturated
- Current gain = beta = 100

R 900 + 100*mo + day	V1	V2	I3	I4	I5



Fourier Transform

6) Determine y(t) given that

$$x(t) = 24 + m\sin(40t) + d\cos(80t)$$

where

- m is your birth month (1..12) and
- d is your birth date (1..31)

m birth month (1..12)	d birth date (1..31)	y(t)