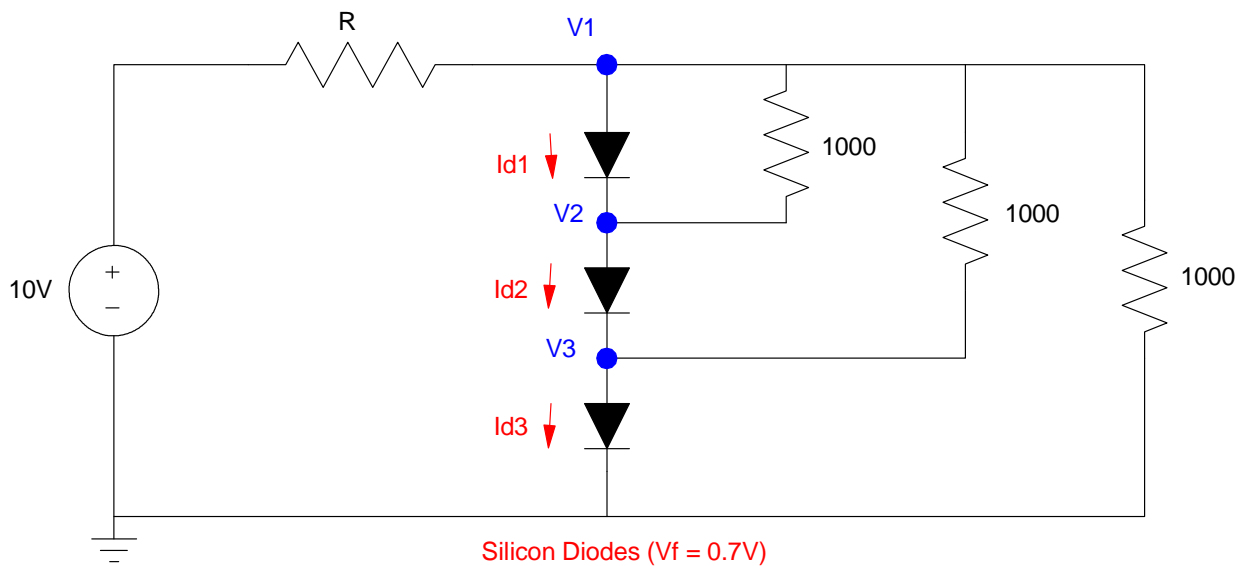# ECE 320 - Quiz #3  -  Name _____

### Ideal Diodes, LEDs, AC to DC Converters  -  Spring 2021

1) Determine the voltages and currents for the circuit.  Assume
- Ideal silicon diodes (Vf = 0.7V).
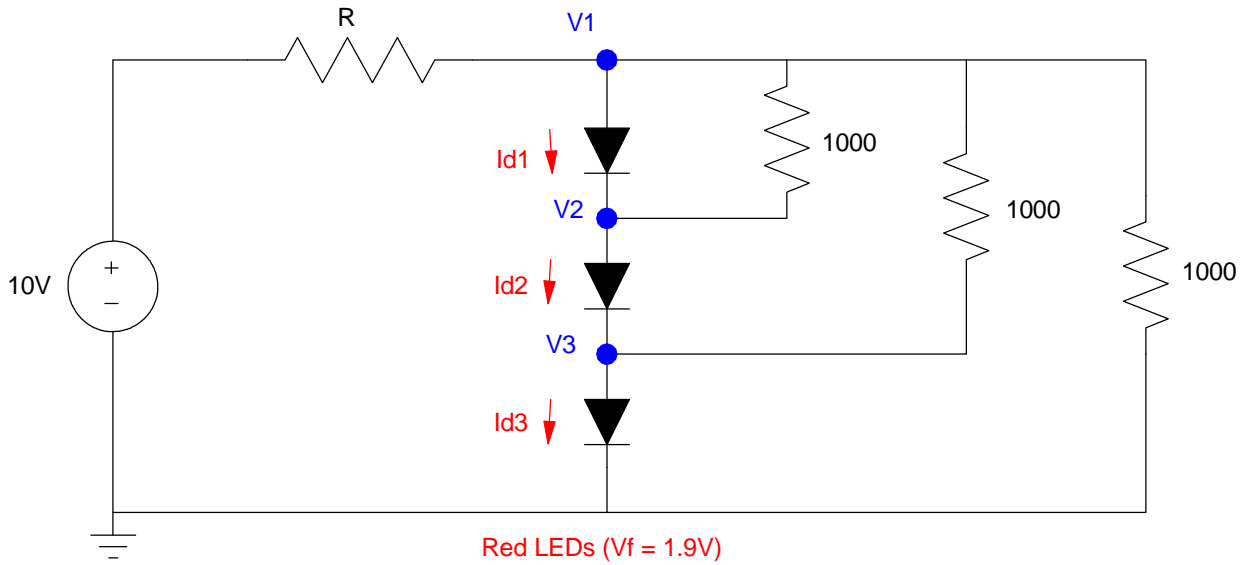- R is 1000 + 100*(your birth month) + (your birthday).  For example, May 14 = 1514 Ohms)

| V1 | V2 | V3 | Id1 | Id2 | Id3 |
|----|----|----|-----|-----|-----|
|    |    |    |     |     |     |



Silicon Diodes (Vf = 0.7V)

2) Determine the voltages and currents for the circuit.  Assume
  - Ideal red diodes (Vf = 1.9V).
  - R is 1000 + 100*(your birth month) + (your birthday). For example, May 14 = 1514 Ohms)

| V1 | V2 | V3 | Id1 | Id2 | Id3 |
|----|----|----|-----|-----|-----|
|    |    |    |     |     |     |



Red LEDs (Vf = 1.9V)
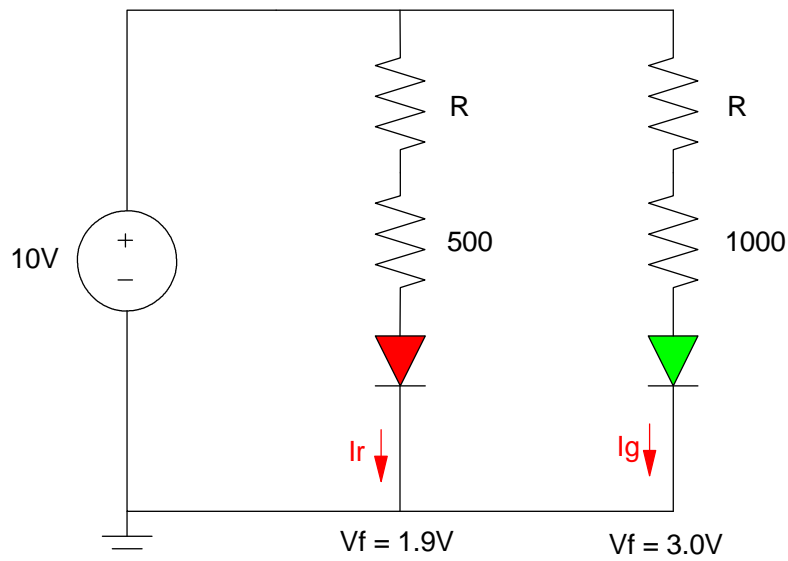
3) A red and green LED are connected to a 10V source. Determine the current and brighness of each LED. Assume

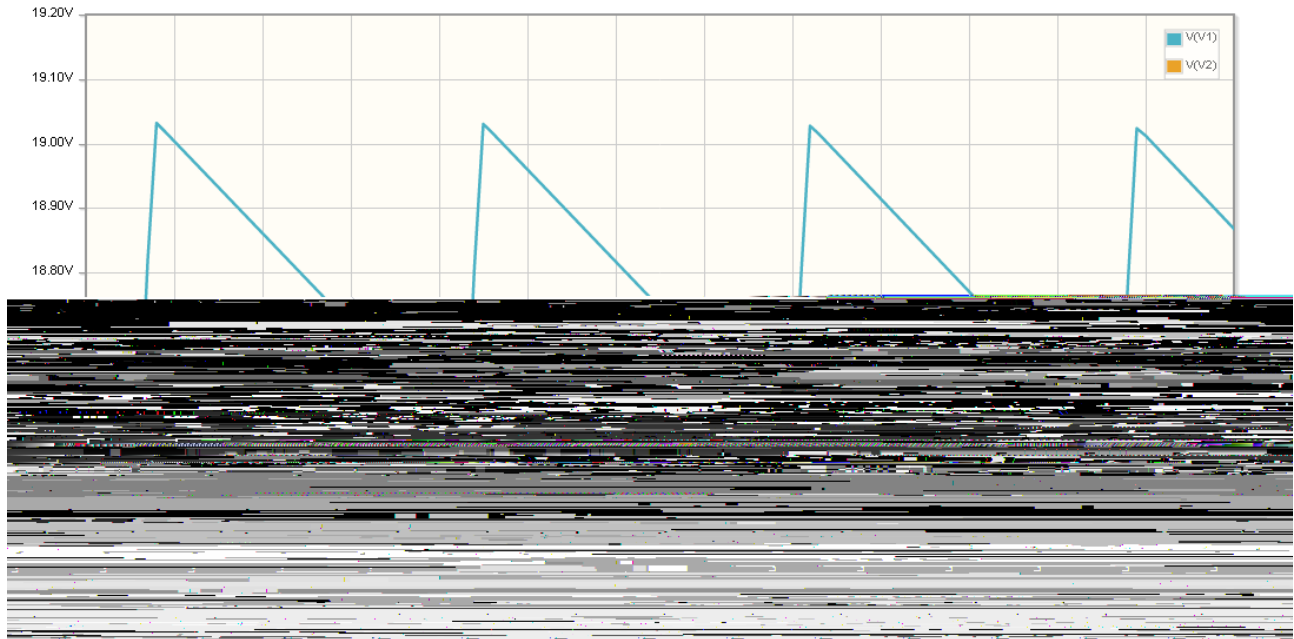- R is 1000 + 100*(your birth month) + (your birthday). For example, May 14 = 1514 Ohms)
- Red LED:      Vf = 1.9V @ 20mA,     3,000mcd @ 20mA
- Green LED:     Vf = 3.0V @ 20mA,     3,000mcd @ 20mA

| R | Red LED | | Green LED | |
|---|---|---|---|---|
|  | Ir | mcd(red) | Ig | mcd(green) |
|  |  |  |  |  |

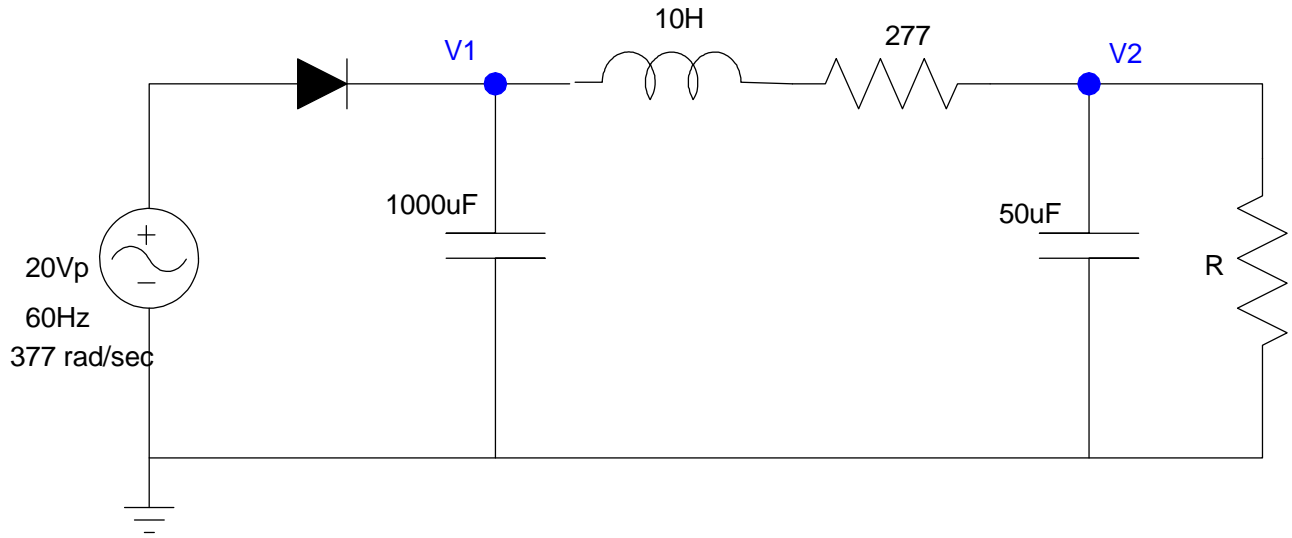4) The following waveforms are found using Circuit lab for V1 for an AC to DC converter. Determine the following

| Frequency (Hz) | V1 (blue waveform) | |
| --- | --- | --- |
| | DC (average) | AC (Vpp) |
| | | |

5) Determine the voltages V1 and V2 (both DC and).AAssume
- Ideal silicon didoes (Vf = 0.7V)
- R is 1000 + 100*(your birth month) + (your birthday)For example, May 14 = 1514 Ohms)

| V1 | | V2 | |
|---|---|---|---|
| DC (mean(V1)) | AC (V1pp) | DC (mean(V2)) | AC (V2pp) |
| | | | |

6) Determine C1, and C2 so that
- The ripple at V1 is 4Vpp and
- The ripple at V2 = 200mVpp

Let R be 1000 + 100*(your birth month) + (your bday).  For example, May 14 = 1514 Ohms)

| R | C1 | C2 |
|---|----|----|
|   |    |    |

10H

277

V1

V2

C1

C2

R

20Vp

60Hz

377 rad/sec