ECE 320 - Quiz #8 - Name _____

Boolean Logic, DTL, TTL Logic.

Boolean Logic

1) Implement the following logic using NAND gates (circuit the ones).
   - Y = 1 if ABCD is prime: {2, 3, 5, 7, 11, 13}

Y	CD			
	00	01	11	10
AB 00	0	0	1	1
AB 01	0	1	1	0
AB 11	0	1	0	0
AB 10	0	0	1	0

Boolean Logic

2) Implement the following logic using NOR gates (circuit the zeros).

- Y = 1 if ABCD is prime: {2, 3, 5, 7, 11, 13}

Y

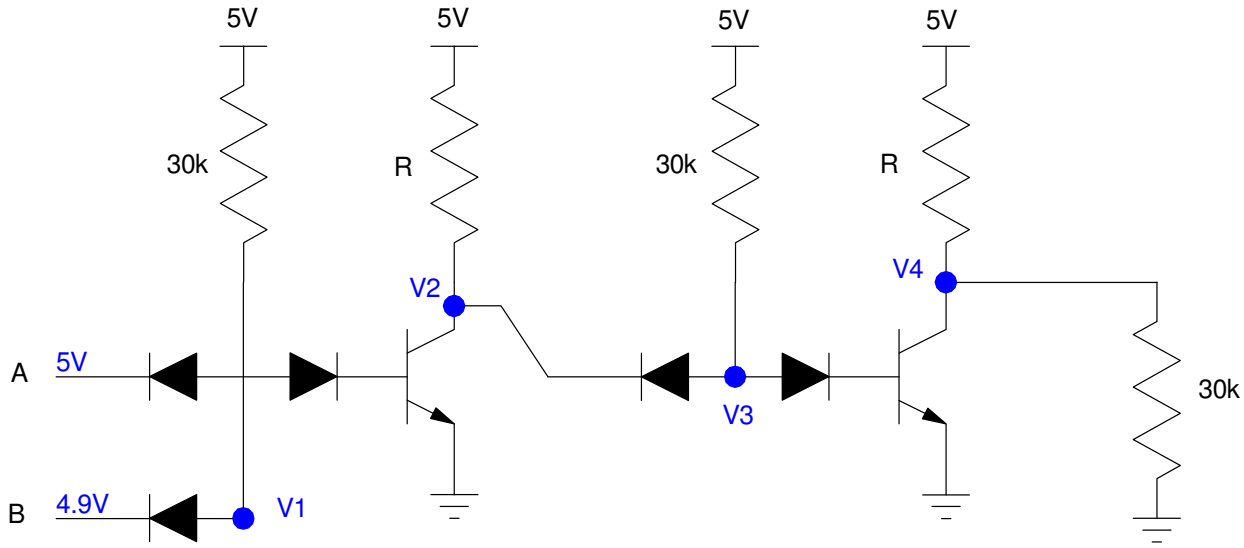
AB \ CD	00	01	11	10
00	0	0	1	1
01	0	1	1	0
11	0	1	0	0
10	0	0	1	0

DTL Logic Gate:

3) Determine the voltges and currents for the following DTL gate. Assume

- Ideal 3904 transistors (Vbe = 0.7V, Vce(sat) = 0.2V, gain = 100)
- Ideal silicon diodes (Vf = 0.7V)
- R = 1000 + 100(Birth Month) + (Birth Day). For example, May 14th gives R = 1514 Ohms.

R	V1	V2	V3	V4

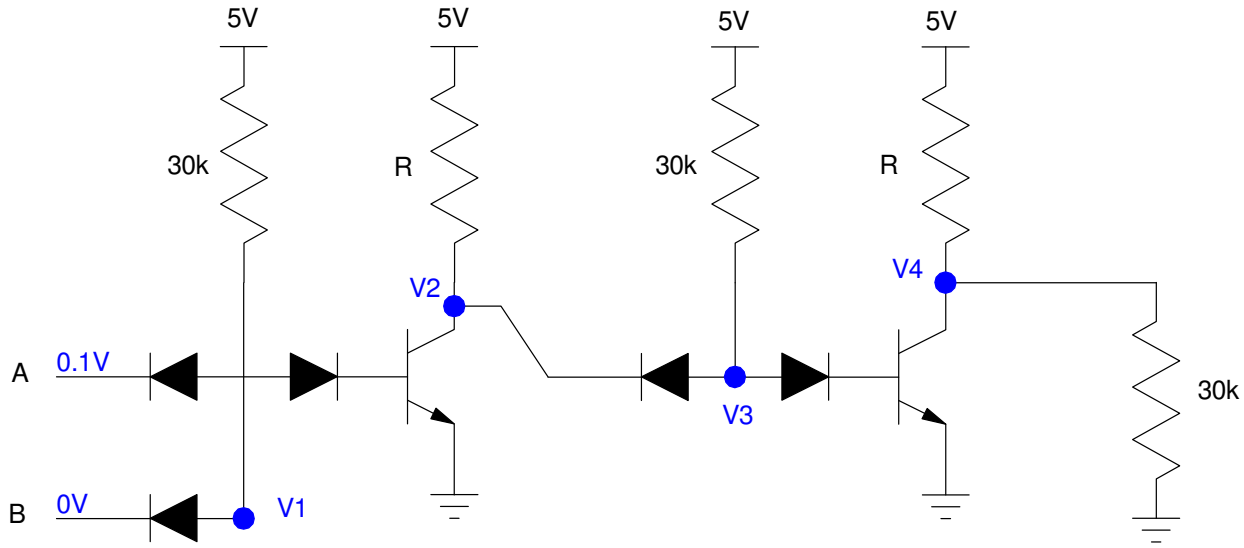


DTL Logic Gate:

4) Determine the voltges and currents for the following DTL gate. Assume

- Ideal 3904 transistors (Vbe = 0.7V, Vce(sat) = 0.2V, gain = 100)
- Ideal silicon diodes (Vf = 0.7V)
- R = 1000 + 100(Birth Month) + (Birth Day). For example, May 14th gives R = 1514 Ohms.

R	V1	V2	V3	V4

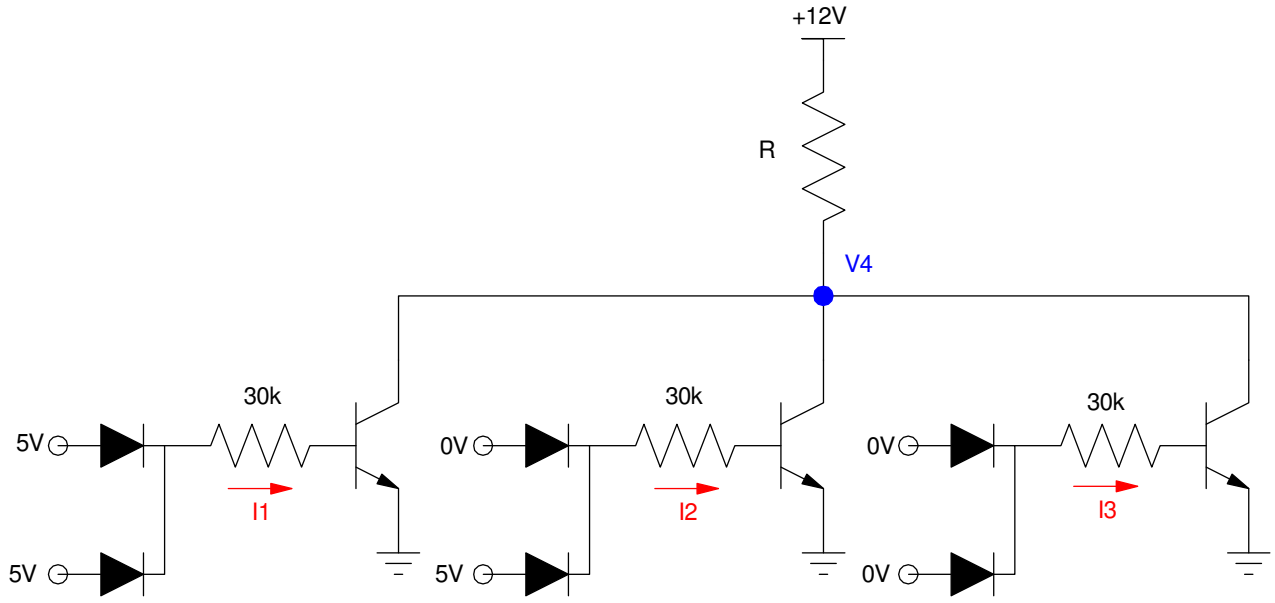


Open Collector Logic

5) Determine the voltages and currents for the following circuit. Assume

- Ideal silicon diodes (Vf = 0.7V)
- Vbe = 0.7V
- β = 100
- R = 1000 + 100(Birth Month) + (Birth Day). For example, May 14th gives R = 1514 Ohms.

R	I1	I2	I3	V4



TTL Logic

6) Determine the voltges and currents for the following DTL gate. Assume

- Ideal 3904 transistors (Vbe = 0.7V, Vce(sat) = 0.2V, β = 2 (left) or 100 (right) transistor
- R = 1000 + 100(Birth Month) + (Birth Day). For example, May 14th gives R = 1514 Ohms.

R	V1	V2	V3	V4