

ECE 320 - Quiz #8 - Name _____

Boolean Logic, DTL, TTL Logic, MOSFETs.

Boolean Logic

1) Design a circuit using NAND gates to implement the following logic

f(A,B,C,D)		CD			
		00	01	11	10
AB	00	x	x	x	1
	01	0	0	0	x
	11	0	1	1	1
	10	1	x	x	x

2) Design a circuit using NOR gates to implement the following logic:

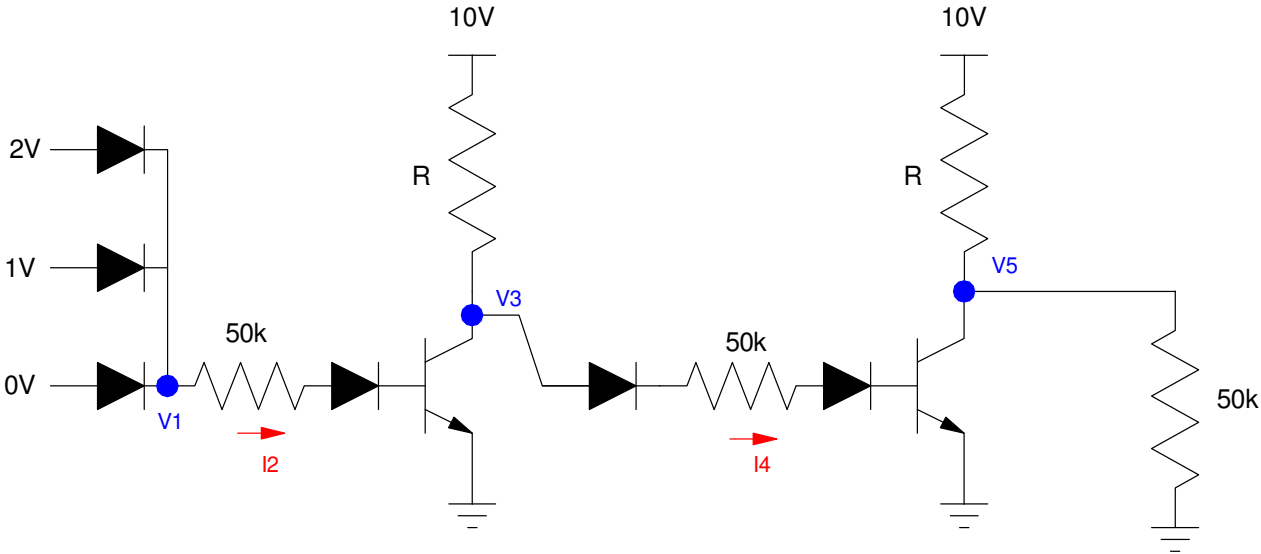
f(A,B,C,D)		CD			
		00	01	11	10
AB	00	x	x	x	1
	01	0	0	0	x
	11	0	1	1	1
	10	1	x	x	x

DTL: 10V Logic Logic

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

- Ideal 3904 transistors ($V_{be} = 0.7V$, $V_{ce(sat)} = 0.2V$, gain = 100)
- Ideal silicon diodes ($V_f = 0.7V$)
- $R = 900 + 100(\text{Birth Month}) + (\text{Birth Day})$.

R	V1	I2	V3	I4	V5
$900 + 100 \cdot \text{mo} + \text{day}$					

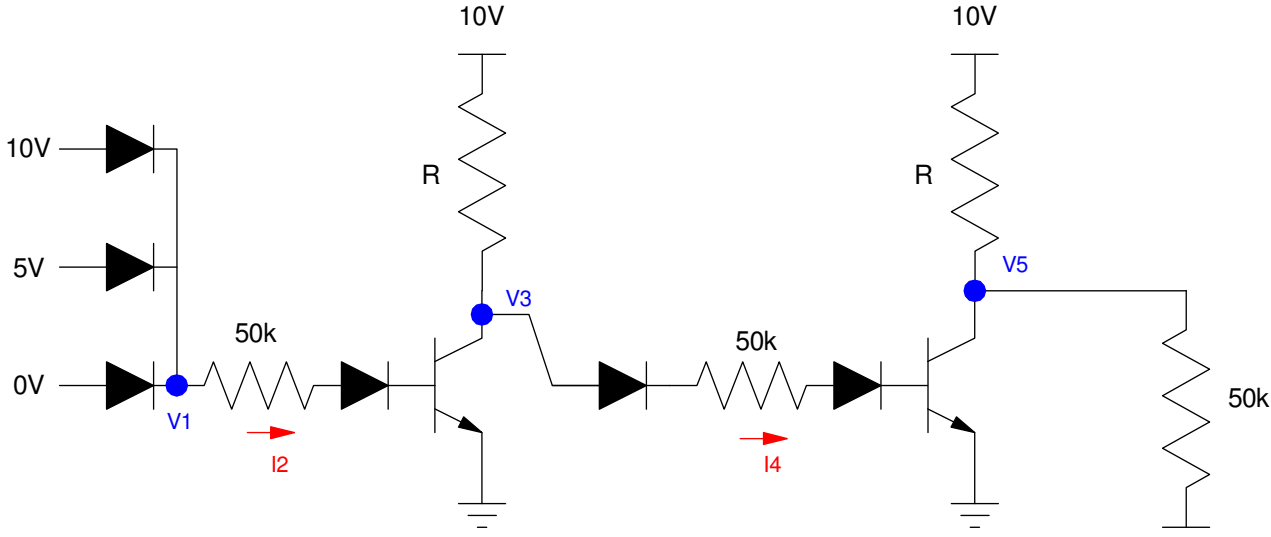


DTL 10V Logic Gate:

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

- Ideal 3904 transistors ($V_{be} = 0.7V$, $V_{ce(sat)} = 0.2V$, gain = 100)
- Ideal silicon diodes ($V_f = 0.7V$)
- $R = 900 + 100(\text{Birth Month}) + (\text{Birth Day})$.

R	V1	I2	V3	I4	V5
900 + 100*mo +day					

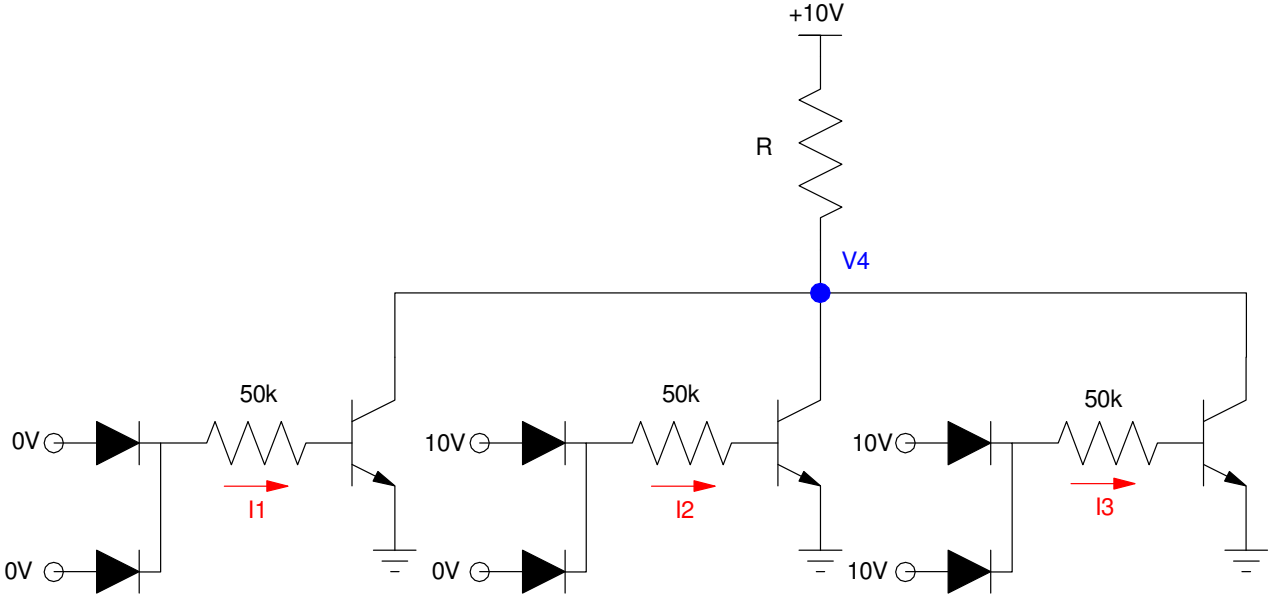


10V Open Collector Logic

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

- Ideal silicon diodes ($V_f = 0.7V$)
- $V_{be} = 0.7V$
- $\beta = 100$
- $R = 900 + 100(\text{Birth Month}) + (\text{Birth Day})$.

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



TTL Logic

6) Determine the voltages and currents for the following TTL gate. Assume

- Ideal 3904 transistors ($V_{be} = 0.7V$, $V_{ce(sat)} = 0.2V$, $\beta = 100$)
- $R = 900 + 100(\text{Birth Month}) + (\text{Birth Day})$.

R 900 + 100*mo +day	V1	V2	V3	I4	I5

