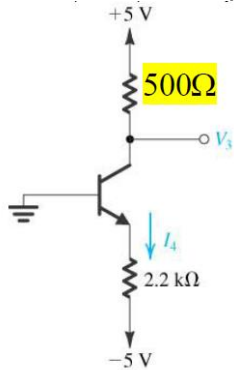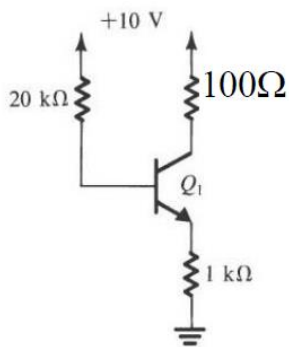1. The terminal voltages of various *npn* transistors are measured during operation in their respective circuits with the following results:

Case	E	B	C	Mode
1	0	0.7	0.7	
2	0	0.8	0.1	
3	-0.7	0	0.7	
4	-0.7	0	-0.6	
5	-2.7	-2.0	0	
6	0	0	5	

2. Use $|V_{BE}|=0.7$, $\beta=100$. Find I_B, I_C, I_E, V_B, V_C, V_E.

+5 V

500Ω

V_3

I_4

2.2 kΩ

−5 V

3. Use $|V_{BE}|=0.7$, $\beta=100$. Find I_B, I_C, I_E, V_B, V_C, V_E.

+10 V

20 kΩ

100Ω

Q_1

1 kΩ

4. Use $|V_{BE}|=0.7$, $\beta=100$. Find I_B, I_C, I_E, V_B, V_C, V_E.

+10 V

1 kΩ

Q_2

10 kΩ

50Ω

−10 V

-10V

5. Use $|V_{BE}|=0.7$, $\beta=100$. Find I_B, I_C, I_E, V_B, V_C, V_E.

+3V
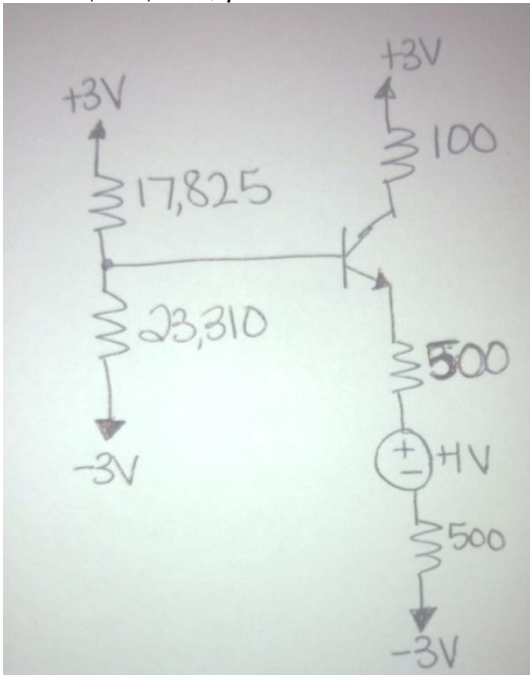
91 kΩ

3.3 kΩ

V_{11}

V_{10}

150 kΩ

V_{12}

1kΩ

-3V
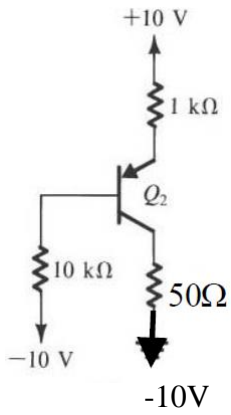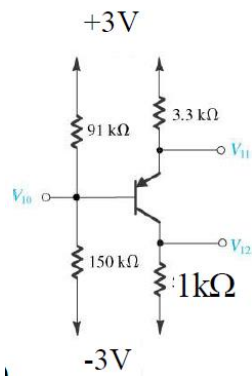
6. For the circuit on the right. Use $|V_{BE}|=0.7$, $\beta=100$, $V_T=25mV$.
Find I_{B4}, I_{C4}, I_{E4}, V_{B4}, V_{C4}, V_{E4}.

+15

+15

I_{C4}

1K

10K

I_{B4}

B4

$Q4$

V_o

$R_L = 1K$

10K

-15

5K

I=2m

-15

-15
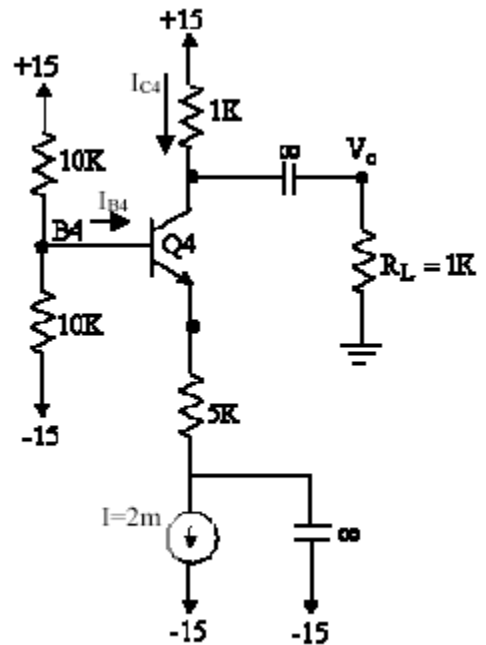
7. Use the circuit below. Use $|V_{BE}|=0.7$, $\beta=100$, $V_T=25mV$. Find I_{B1}, I_{B2}, I_{B3}, I_{C3}, I_{E3}, V_{B1}, V_{C1}, V_{B2}, V_{B3}, V_{E3}. Vs is an AC source.
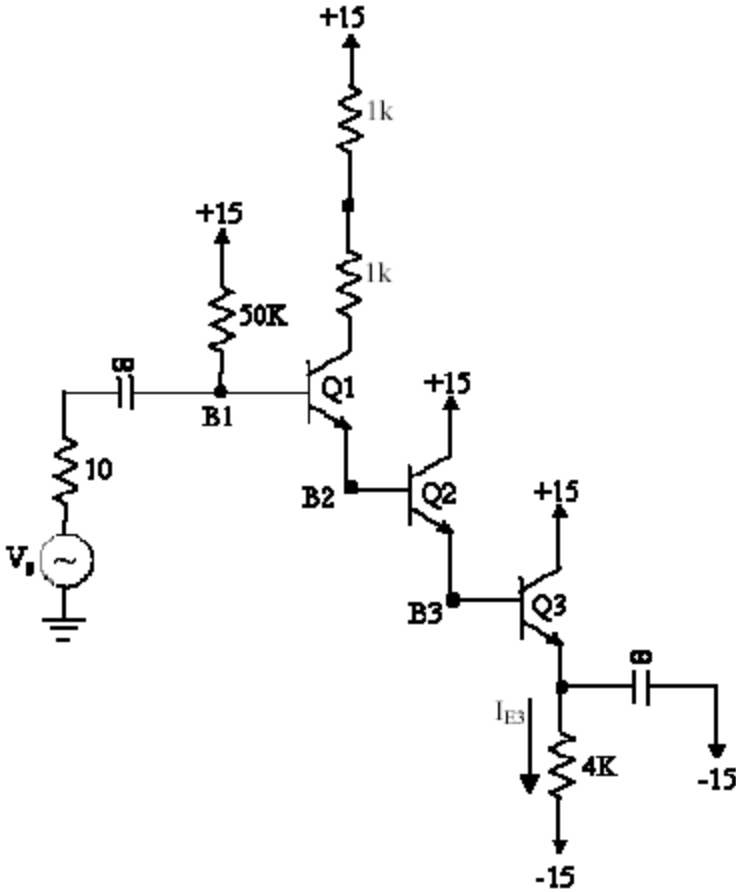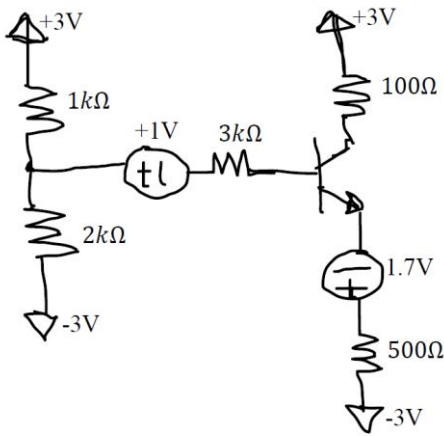

8. Use $|V_{BE}|=0.7$, $\beta=100$. Find the DC values: I_B, I_C, I_E, V_B, V_C, V_E.

9. Find I_E, V_E, I_B, V_B, I_C, V_C
Let β=100.

10. Let β=100. Assume capacitors act as an open for DC operation. Find I_E, V_E, I_B, V_B, I_C, V_C.