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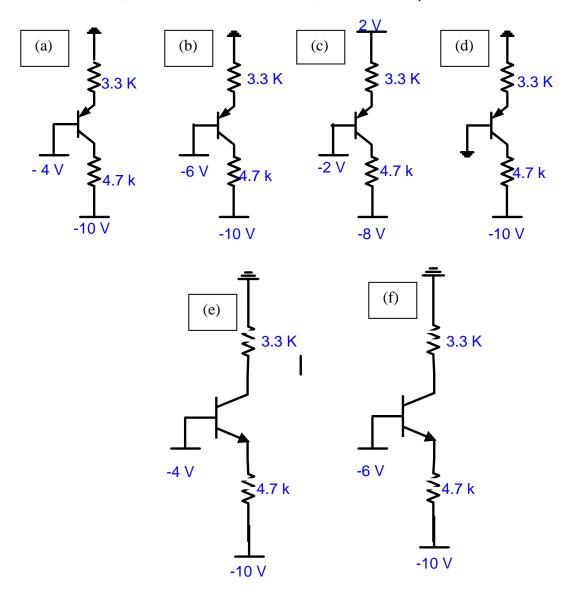
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# **Sheet 4: BJT DC Analysis**

# **Problem 1:**

For the following circuits, find node voltages,  $V_E$ ,  $V_C$ , and branch currents  $I_E$ ,  $I_C$ ,  $I_B$ . Use  $V_{BE}$  ( or  $V_{EB}$  for PNP transistor) = 0.7 V and  $\beta$ =50.



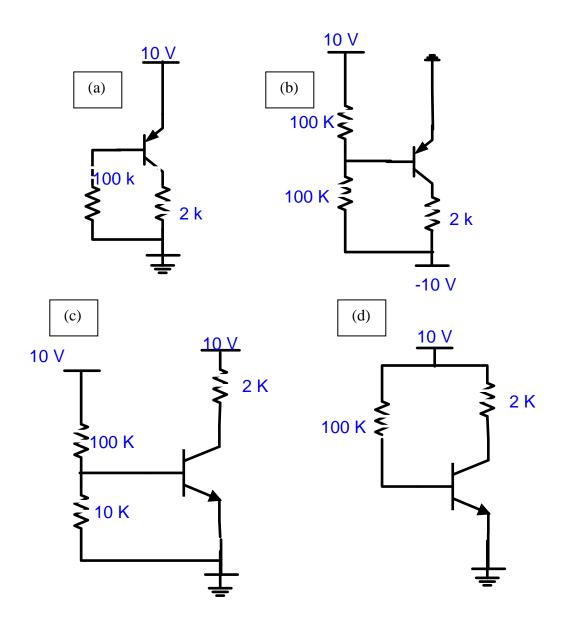
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# **Problem 2:**

For the following circuits in which  $V_{BE}$  (or  $V_{EB}$  for PNP transistor) = 0.7 V and  $\beta$ =10. Find the transistor's DC operating point?



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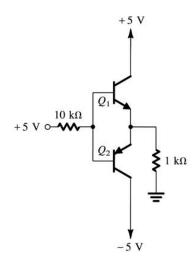
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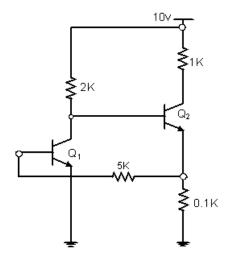
#### **Problem 3:**

Evaluate the voltages at all nodes and the currents through all branches. Assume:  $V_{BE}$  (or  $V_{EB}$  for PNP transistor) = 0.7 V,  $\beta$ =100.



# **Problem 4:**

Evaluate the voltages at all nodes and the currents through all branches. State the DC mode of operation for the transistors. Assume:  $V_{BE}$  (or  $V_{EB}$  for PNP transistor) = 0.7 V  $\beta$ =50.



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# **Problem 5**

For the BJT circuit shown,  $R_1=R_2=10k\Omega$ ,  $V^+=10V$ ,  $V^-=-2V$ ,  $R_C=R_E=5k\Omega$ ,  $R_3=100k\Omega$ ,  $\beta=100$ .

- 1. Find the labeled currents I<sub>B</sub>, I<sub>C</sub>, and I<sub>E</sub>.
- 2. Calculate  $V_{\text{CE}}$
- 3. What is the DC mode of the transistor?

