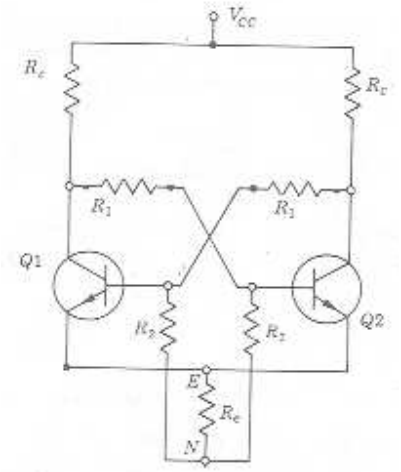
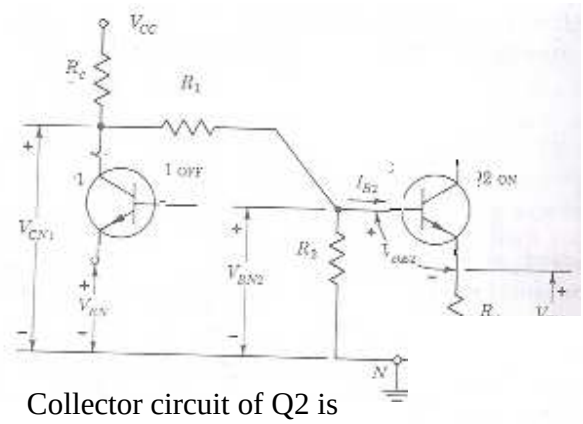
Problems:

1. Calculate the stable-state currents and voltages for the circuit given below. Assume that the transistors have a minimum value of 25.
   Here $V_{CE(sat)} = 0.4V, V_{BE(sat)} = 0.8V$, R_C = 4.7 KΩ , R_1 = 30 KΩ , R_2 = 15 KΩ
   R_E = 0.39 KΩ , V_{CC} = 20 V .

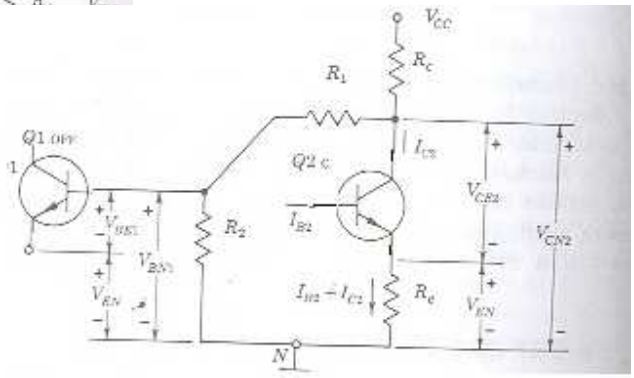


Solution:
Assume that Q1 is OFF & Q2 is ON

Base circuit of Q2 is



Collector circuit of Q2 is



From the above equations ,

V_{BN1} = 0.695 V , $V_{BN2} = 2.48V$, $V_{CN2} = 2.886V$, $V_{CN1} = 17.62V$,

V_E = 1.686 V

$I_{C1} = 0mA$, $I_{B1} = 0mA$, $I_{C2} = 3.87mA$, $I_{B2} = 0.343mA$

$I_{E1} = 0mA$, $I_{E2} = 4.213mA$

Commutating capacitors (or) Speedup capacitors:

we know in bistable multivibrators , transistors are used as a switches.
To speedup the operation of binary there is a need to improve switching speed of the

transistors. To improve the switching of a transistor there is a need to place a capacitor in parallel with a resistor R_1 in the above circuit diagrams.(from the topic of high speed transistor switch).

Here capacitors are used only to speed up the operation of binary. Don't think that these are coupling elements.