



SNS COLLEGE OF TECHNOLOGY

Kurumbapalayam (Po), Coimbatore – 641 107

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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EC201-ANALOG ELECTRONIC CIRCUITS

Topic 9 : Bistable multivibrator

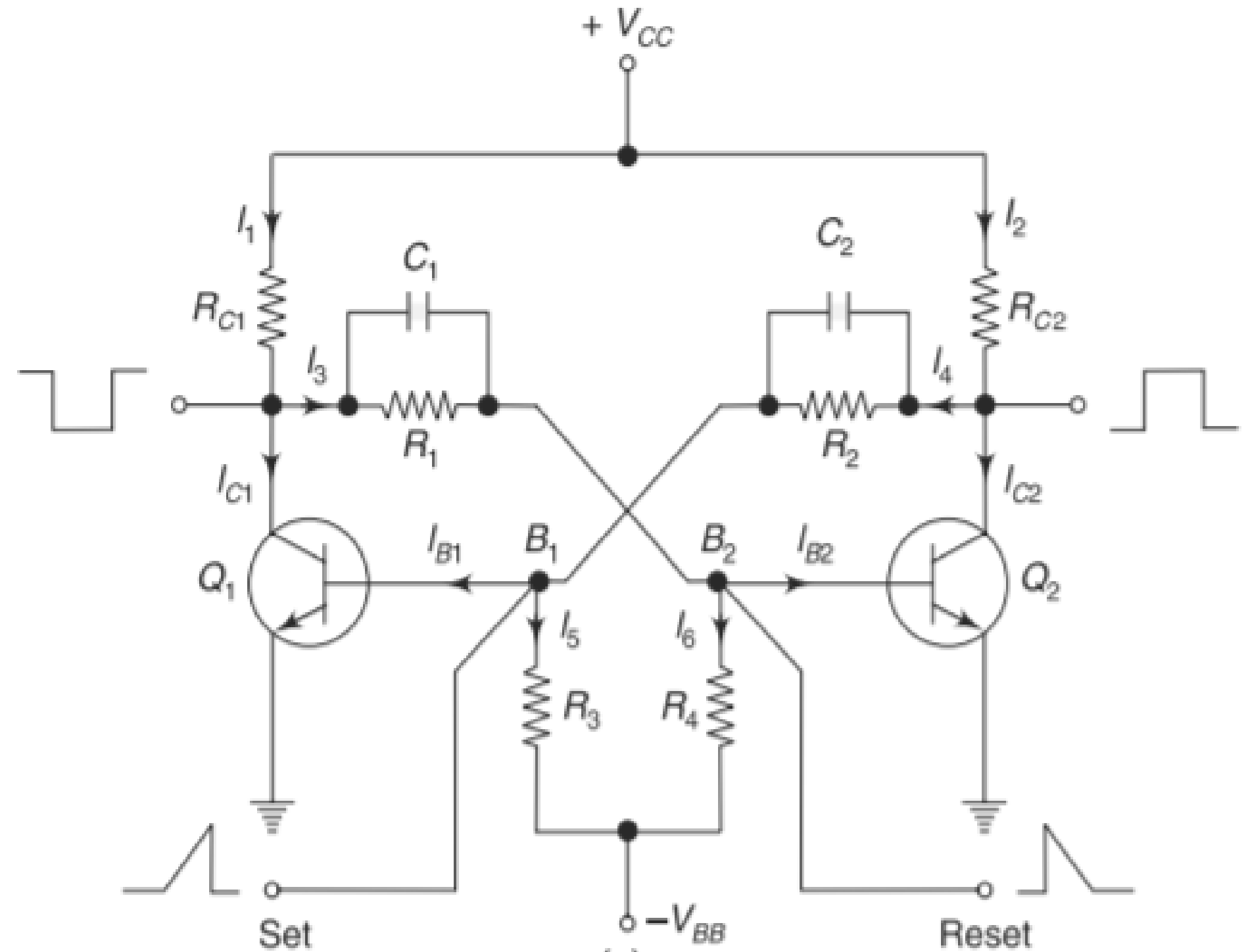




Bistable Multivibrator



- The bistable multivibrator is also referred to as flip-flop.
- It has two stable states.
- A trigger pulse applied to the circuit will cause it to switch from one state to the other.
- Another trigger pulse is then required to switch the circuit back to its original state.

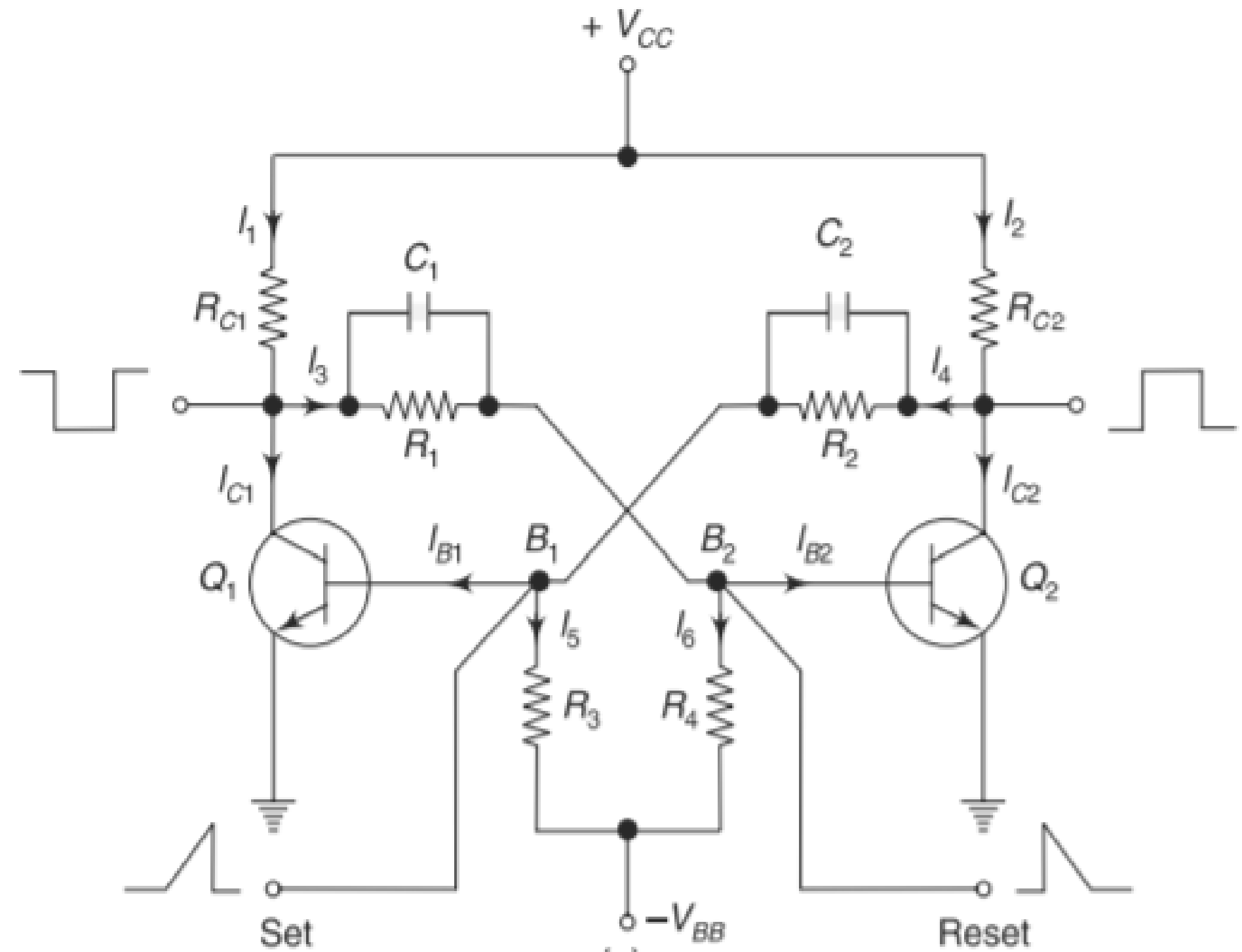




Bistable Multivibrator



- In this circuit the output of a transistor Q2 is coupled to the base of transistor Q1 through a resistor R2.
- Similarly the output of Q1 is coupled to the base of Q2 through resistor R1.

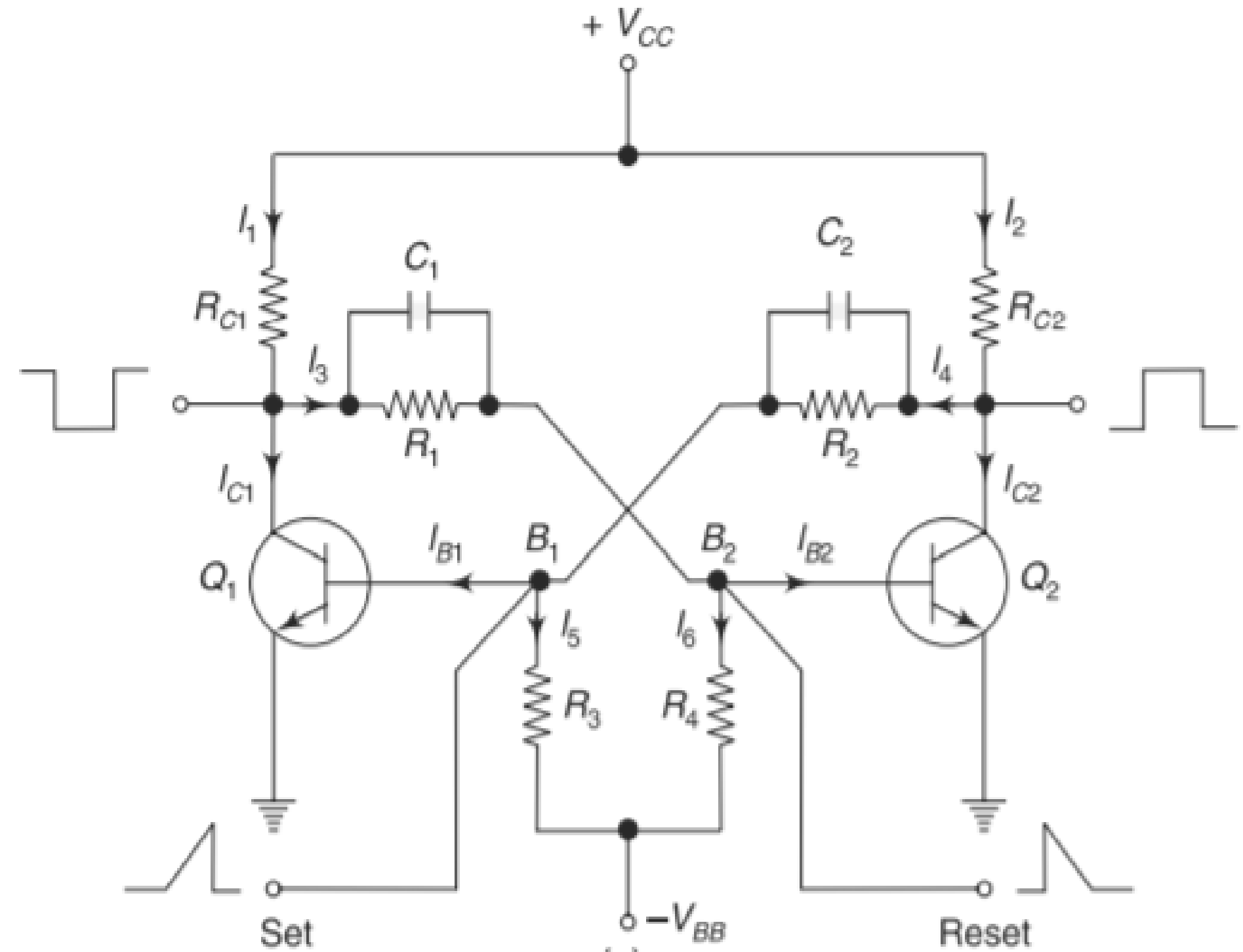




Bistable Multivibrator



- When abruptly changing pulse is applied to the circuit, the transition from one state to other should occur instantaneously.

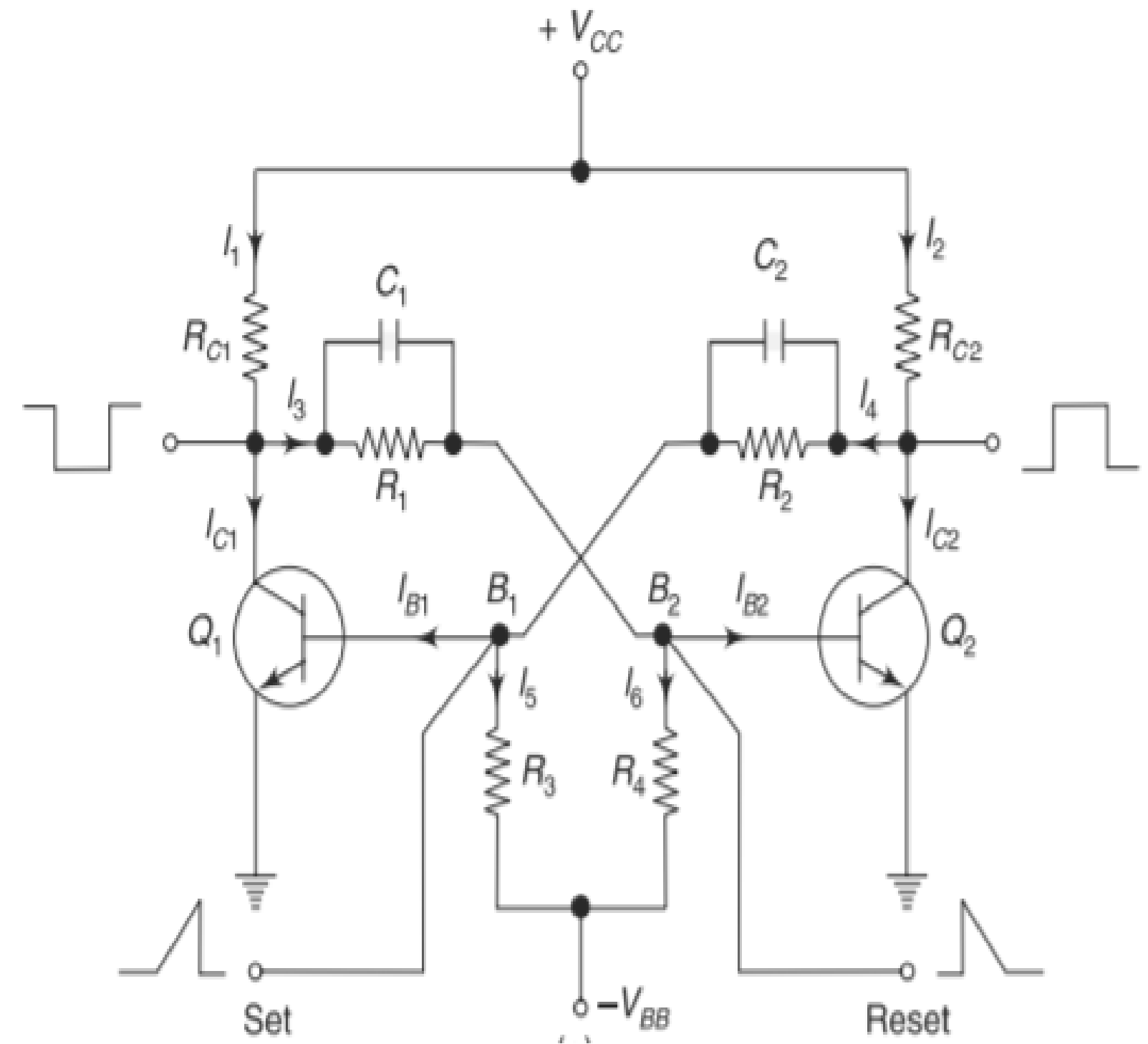




Bistable Multivibrator



- When the circuit is first switched on, one of the transistors will start conducting more than the other.
- This transistor is thus driven into saturation (i.e. ON).
- Then, because of the regenerative feedback action, the other transistor is taken into cut-off (i.e. OFF) state.





Bistable Multivibrator

- Let us assume that transistor Q1 is ON and Q2 is OFF.
- It is a stable state of the circuit and will remain in this state till a trigger pulse is applied from outside.
- A positive triggering pulse applied to the reset input (base of Q2) increases its forward bias, thereby turning transistor Q2 ON and an increase in collector current and a decrease in collector voltage.



Bistable Multivibrator

- The fall in collector voltage is coupled to the base of Q1, wherein it reverse biases the base– emitter circuit and Q1 is thus turned OFF.
- The circuit is then in its second stable state and remains so till a positive trigger pulse is applied to set input (base of Q1).
- A similar action can be achieved by applying a negative pulse at the set input for transition from the first stable state to the second stable state and by applying a negative pulse at the reset input, reverse transition can be obtained.



Applications



1. The bistable multivibrator is used as memory elements in shift registers, counters, and so on.
2. It is used to generate square waves of symmetrical shape by sending regular triggering pulse to the input. By adjusting the frequency of the input trigger pulse, the width of the square wave can be altered.
3. It can also be used as a frequency divider (as a divide by two counter).



References



Electronic Devices and Circuits By Salivahanan

Thank You