SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE NAME : 19EC306 – Digital Circuits

II YEAR / III SEMESTER

Unit III- SEQUENTIAL CIRCUITS

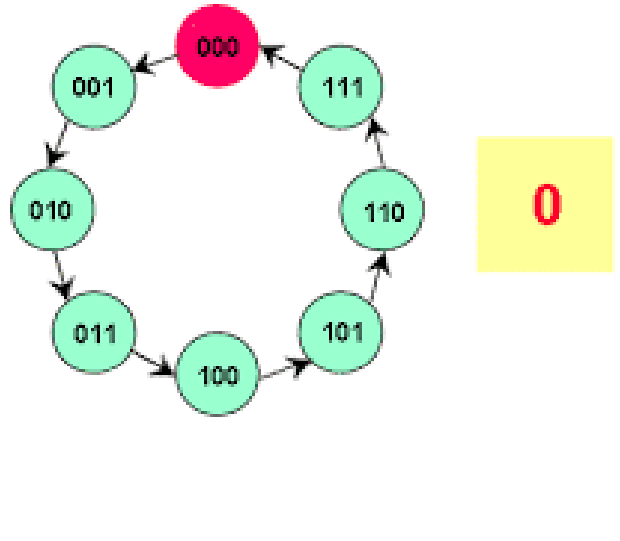
Topic : Synchronous counter

Counter

- A digital circuit which is used for a counting pulses is known as counter.
- Counter is the widest application of flip-flops.
- It is a group of flip-flops with a clock signal applied.

Types of counters

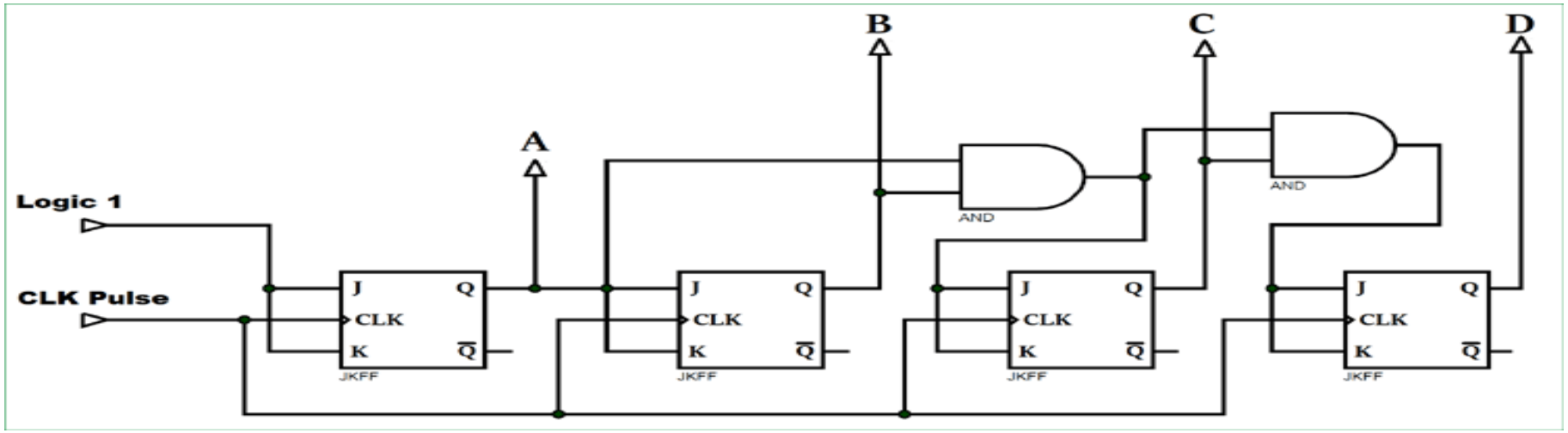
Two Types
1. Asynchronous Counter or Ripple Counter.
2. Synchronous Counter



Synchronous Counter

➢**In synchronous counter**, the clock input across all the flip-flops use the same source and create the same clock signal at the same time.

➢ A counter which is using the same clock signal from the same source at the same time is called **Synchronous counter**.

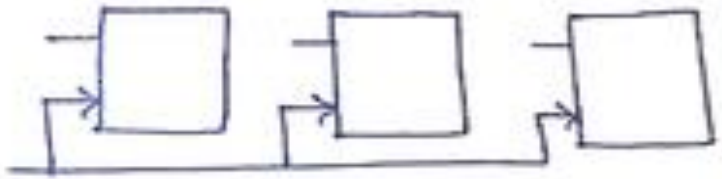


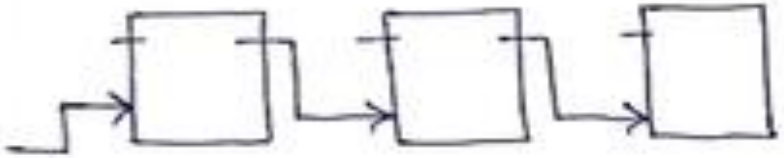
Asynchronous Counter

- Depending upon the manner in which the flip-flop are triggered, counters can be divided into two major categories.
  1) Asynchronous counter (Ripple/series counter).
  2) Synchronous counter (parallel counter).

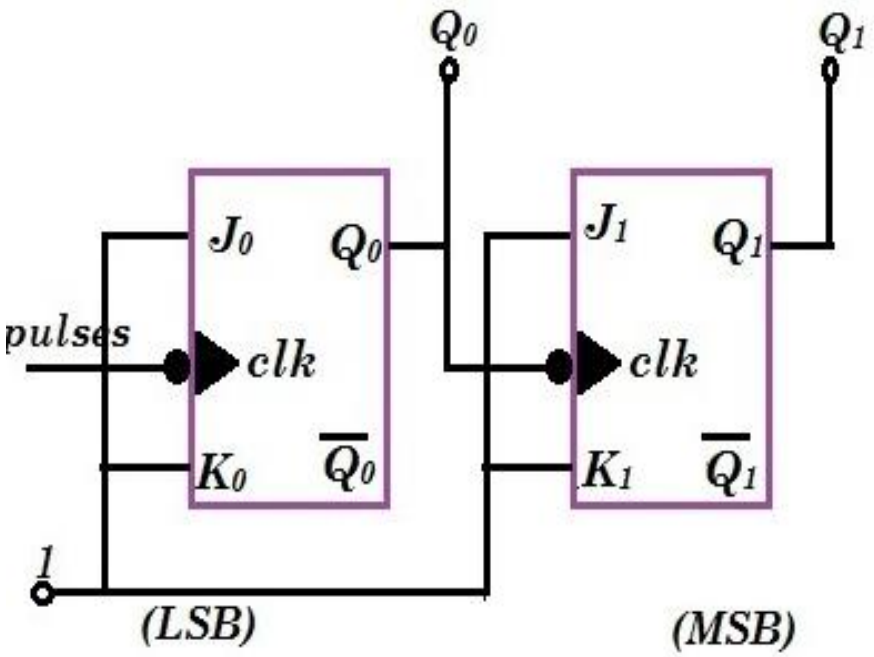
The comparison between synchronous and Asynchronous counter.

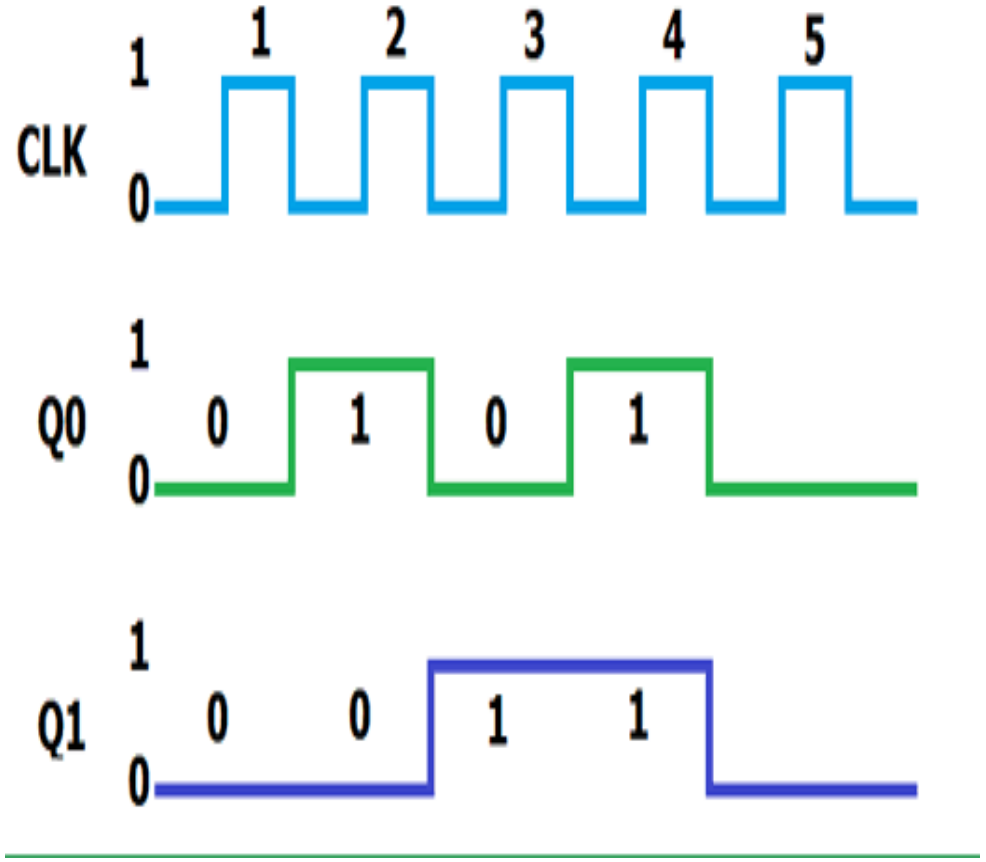
Synchronous	Asynchronous
→ use system clock to trigger all f-f.	→ output of one used as a clock in the next f-f.





2-bit Asynchronous Counter





Synchronous Counter	Asynchronous Counter
All flip flops are triggered with same clock.	Different clock is applied to different flip flops.
It is faster.	It is lower
Design is complex.	I Design is relatively easy.
Decoding errors not present.	Decoding errors present.
Any required sequence can be designed	Only fixed sequence can be designed.

Any Query????

Thank you……