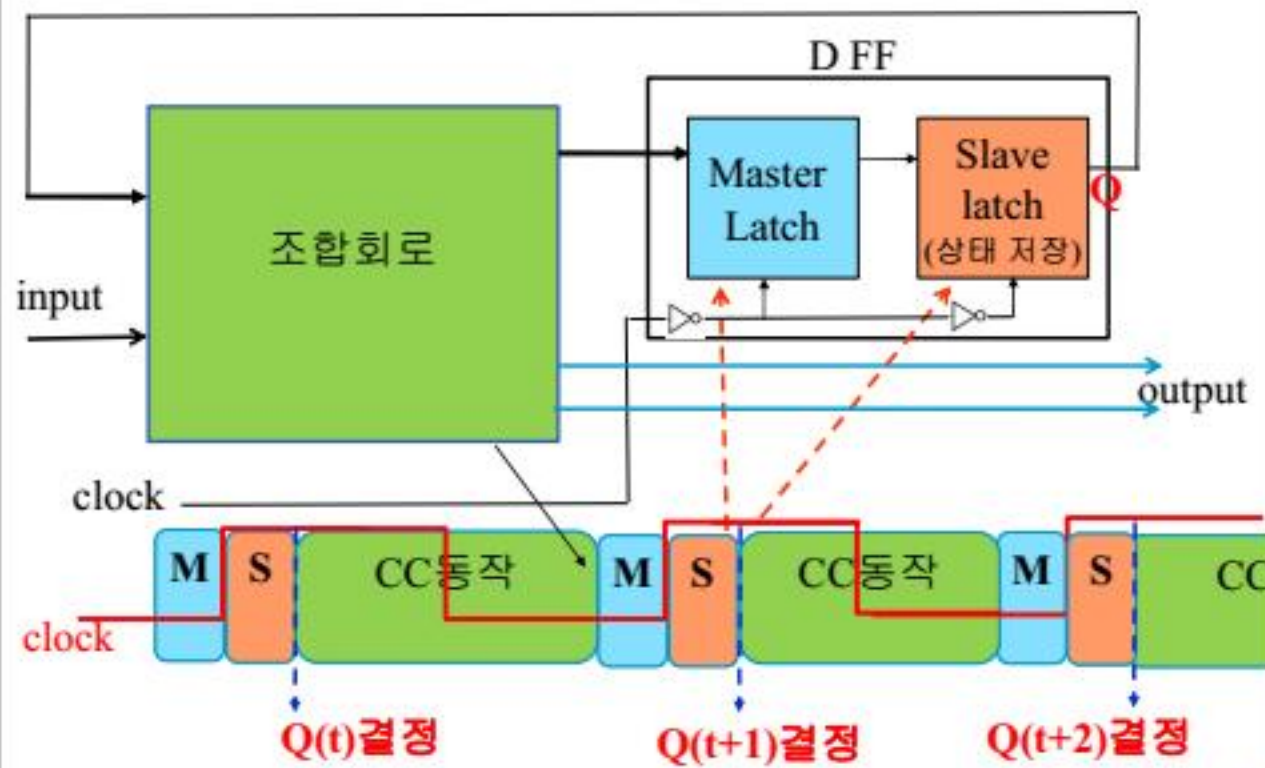


순차회로의 타이밍 p.250

1

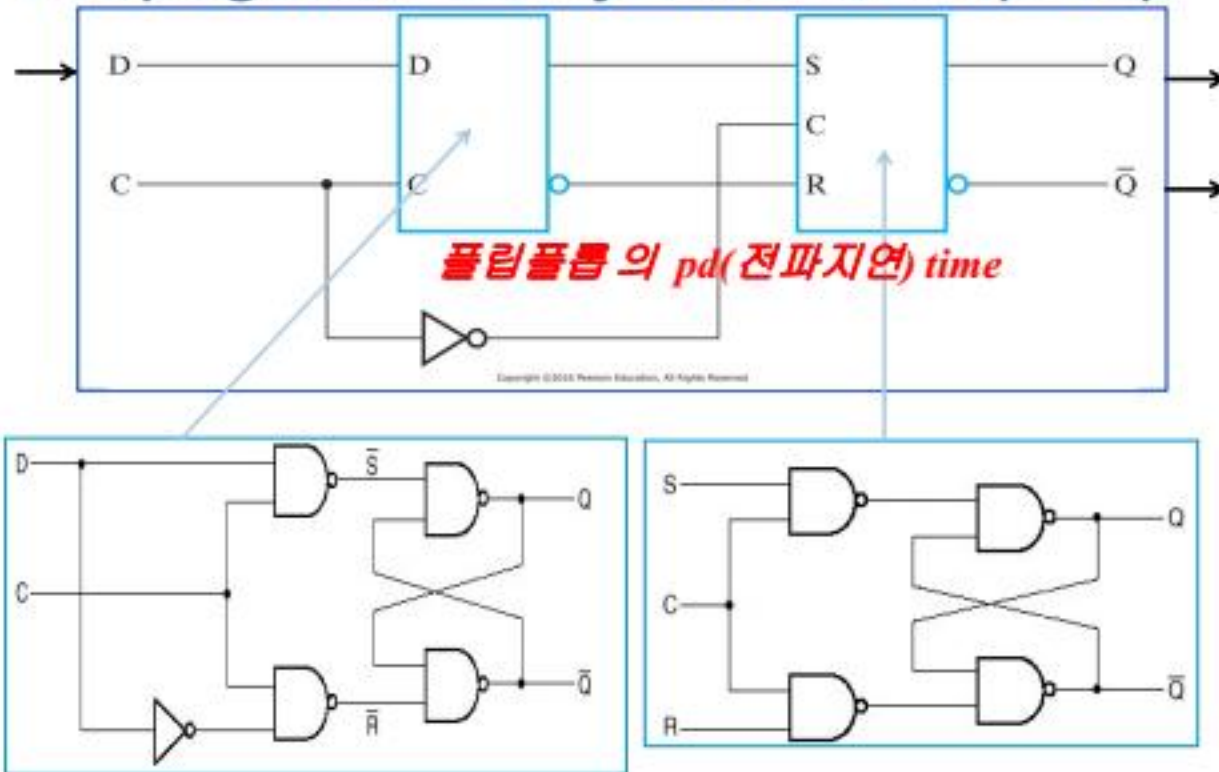
정리 > 순차회로 동작(positive edge 예)



2

2

Propagation Delay Time of FlipFlop



3

순차회로에 맞는 clock의 선택 p.254

■ 필요한 clock 주기의 시간(t_p)은?

$$t_p \geq T_{pd,COMB} + t_{pd,FF} + \text{정확한 처리를 위한 여유시간}$$

조합회로 전파지연시간

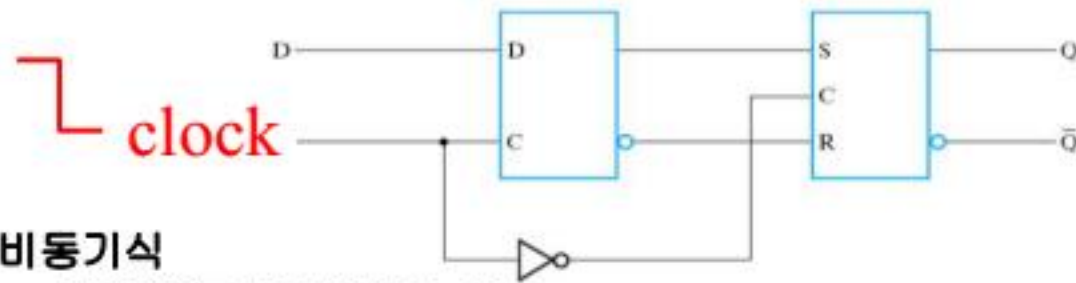
FF 전파지연시간



4

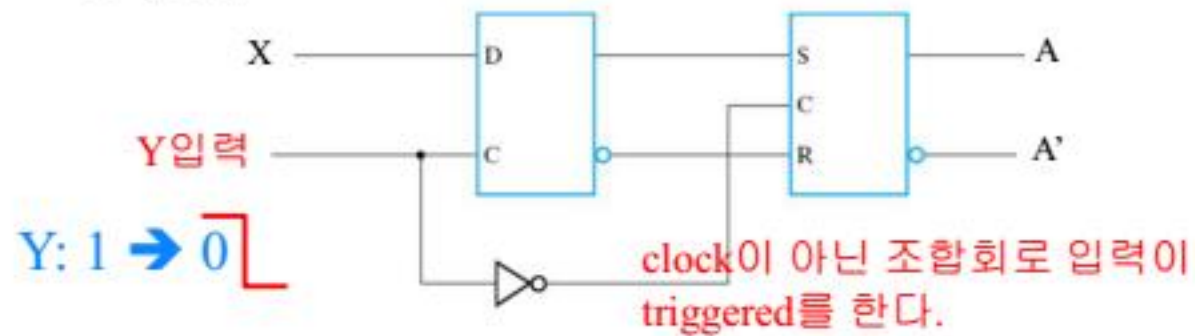
Synchronous-Asynchronous system 구별 p.254

- 동기식 : 클럭에 동기되어 동작하는 상태변수를 가진다.



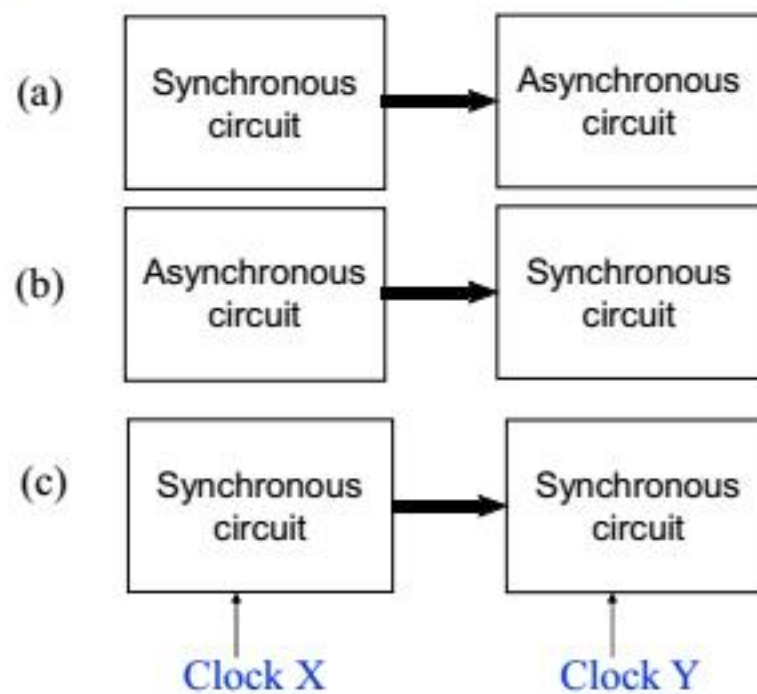
- 비동기식

- 클럭에 동작하지 않는다.
- 언제든지 입력에 의해 변화될 수 있다.



5

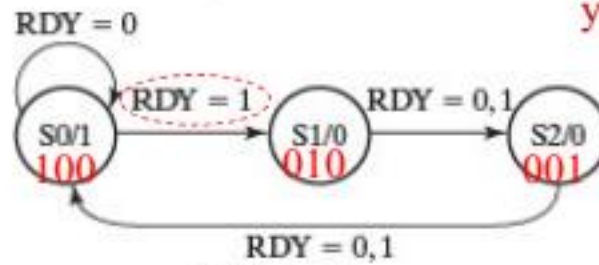
Types of Interactions p.255



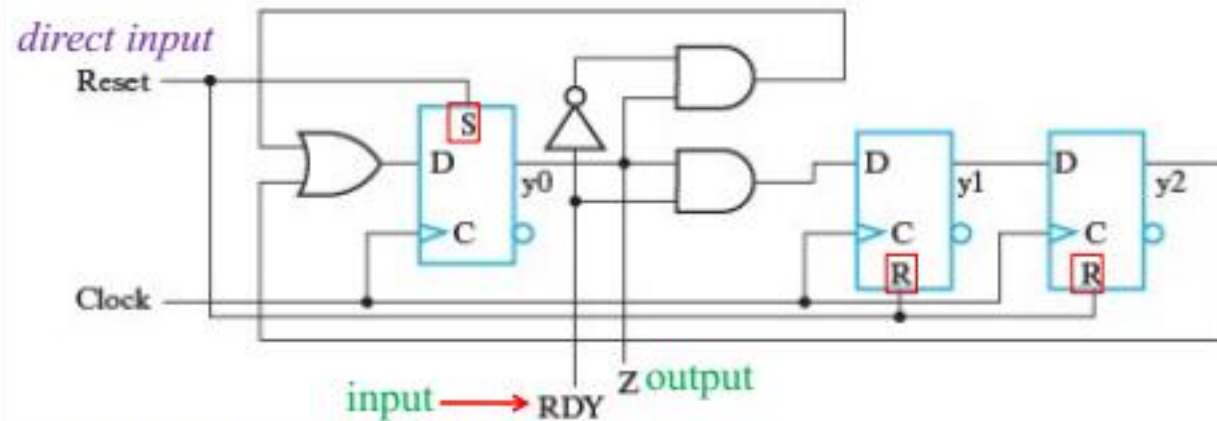
6

Problem Example p.256

S_0, S_1, S_2 : one-hot code 적용
 y_0, y_1, y_2



(a) State diagram

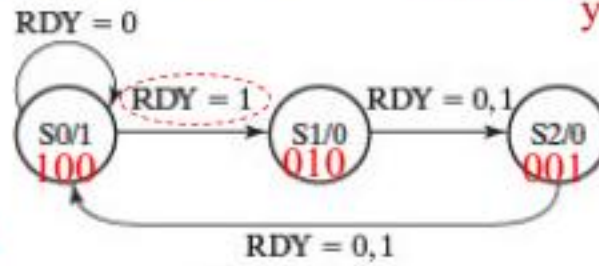


RDY가 비동기입력된다면? (b) Logic diagram

7

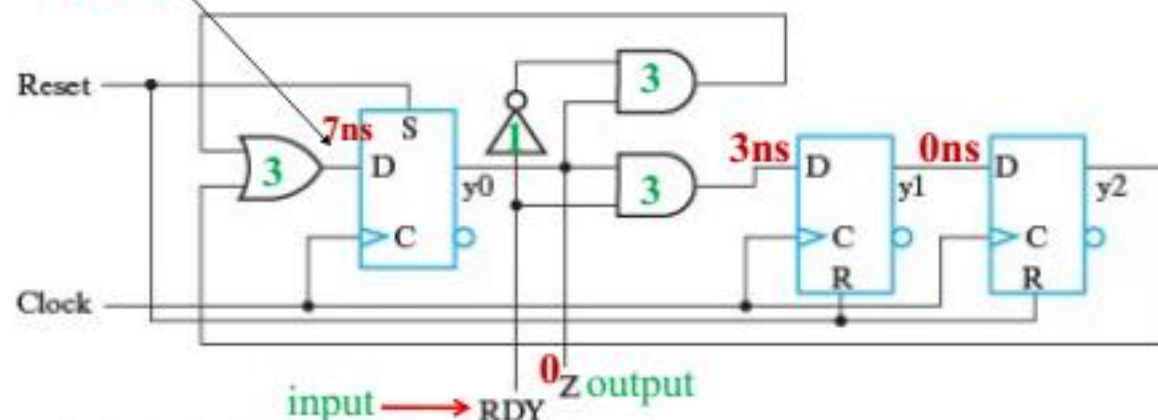
Problem Example p.256

S_0, S_1, S_2 : one-hot code 적용
 y_0, y_1, y_2



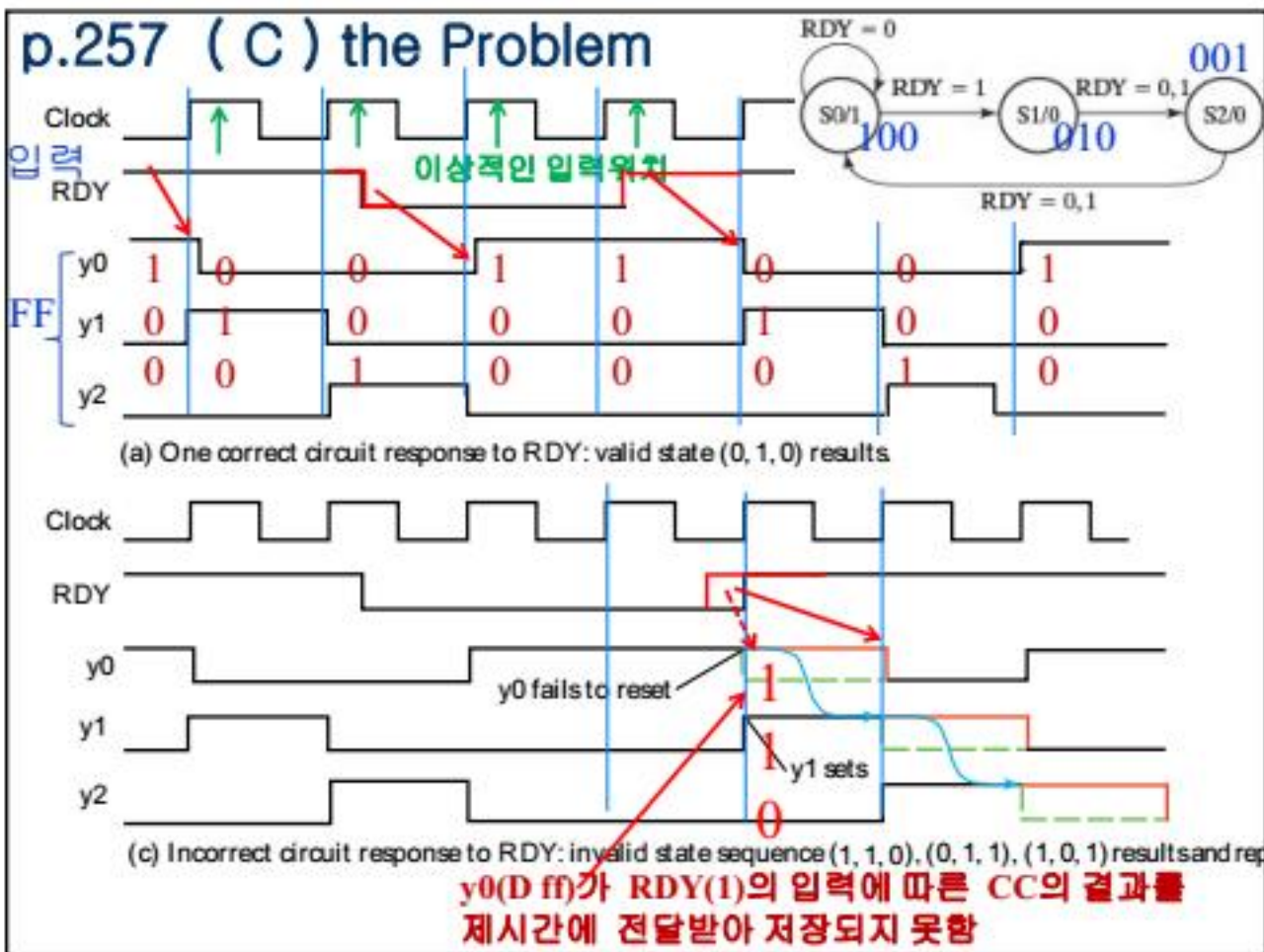
(a) State diagram

게이트 지연시간
가정:

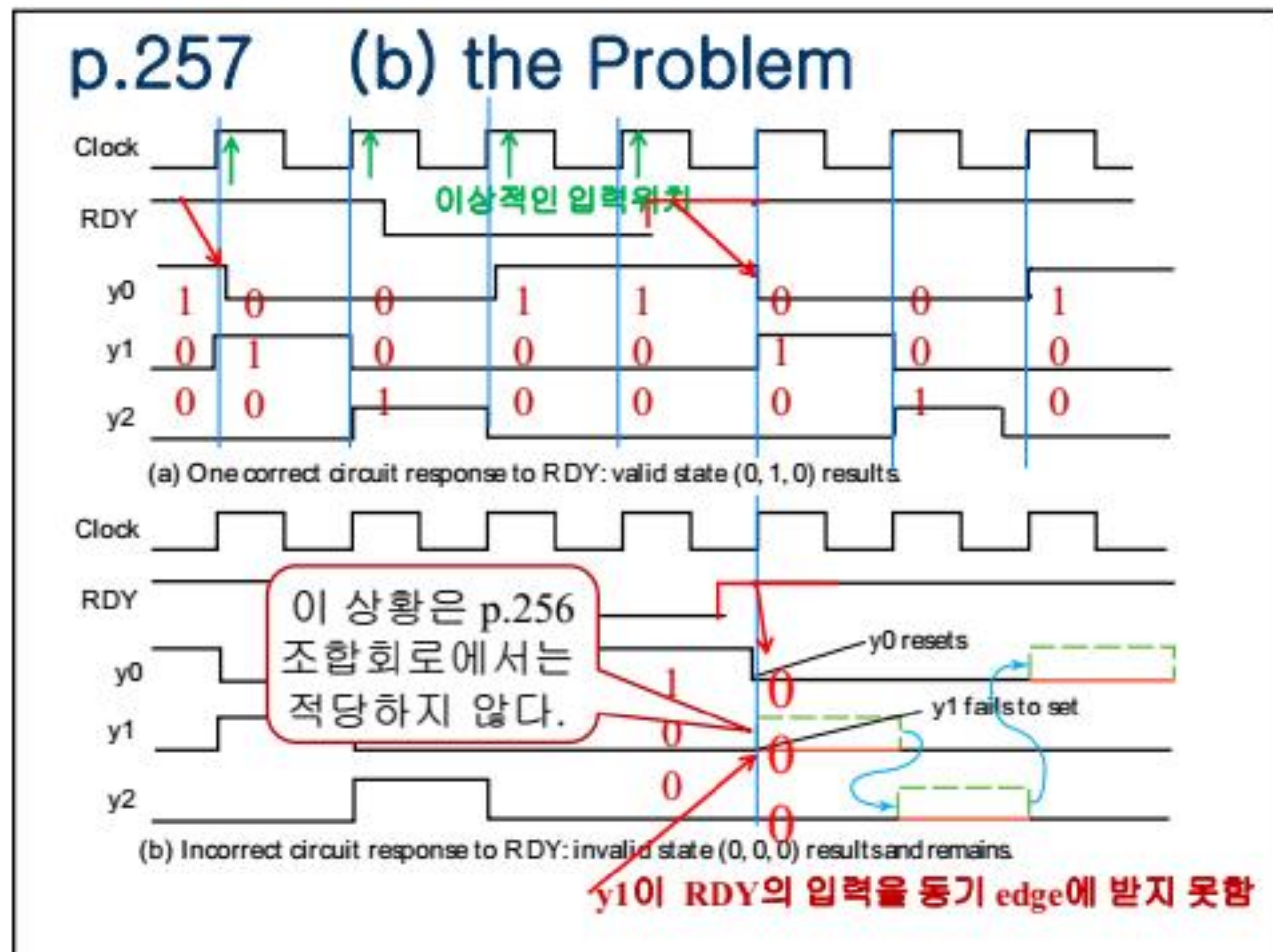


RDY가 비동기입력된다면? (b) Logic diagram

8



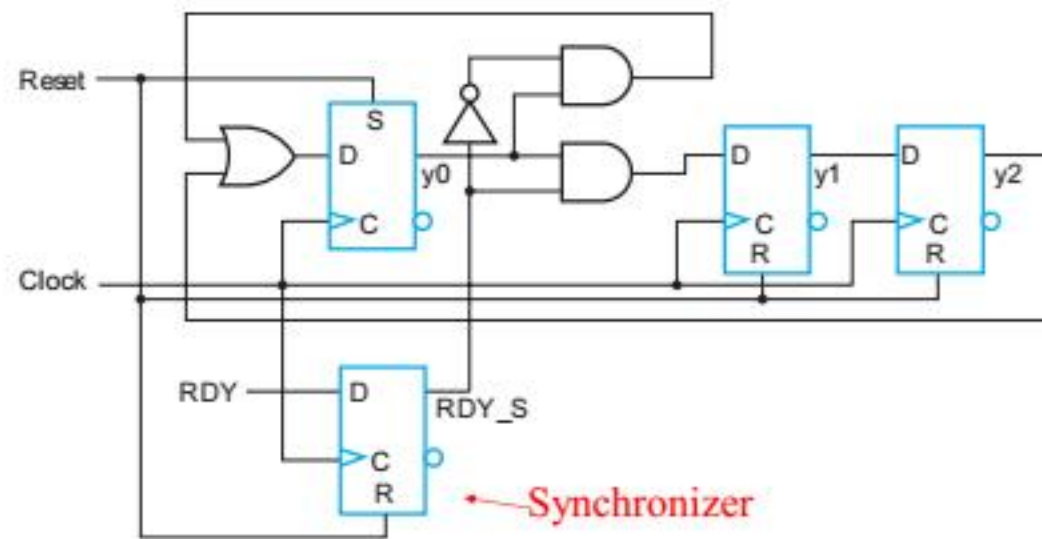
9



10

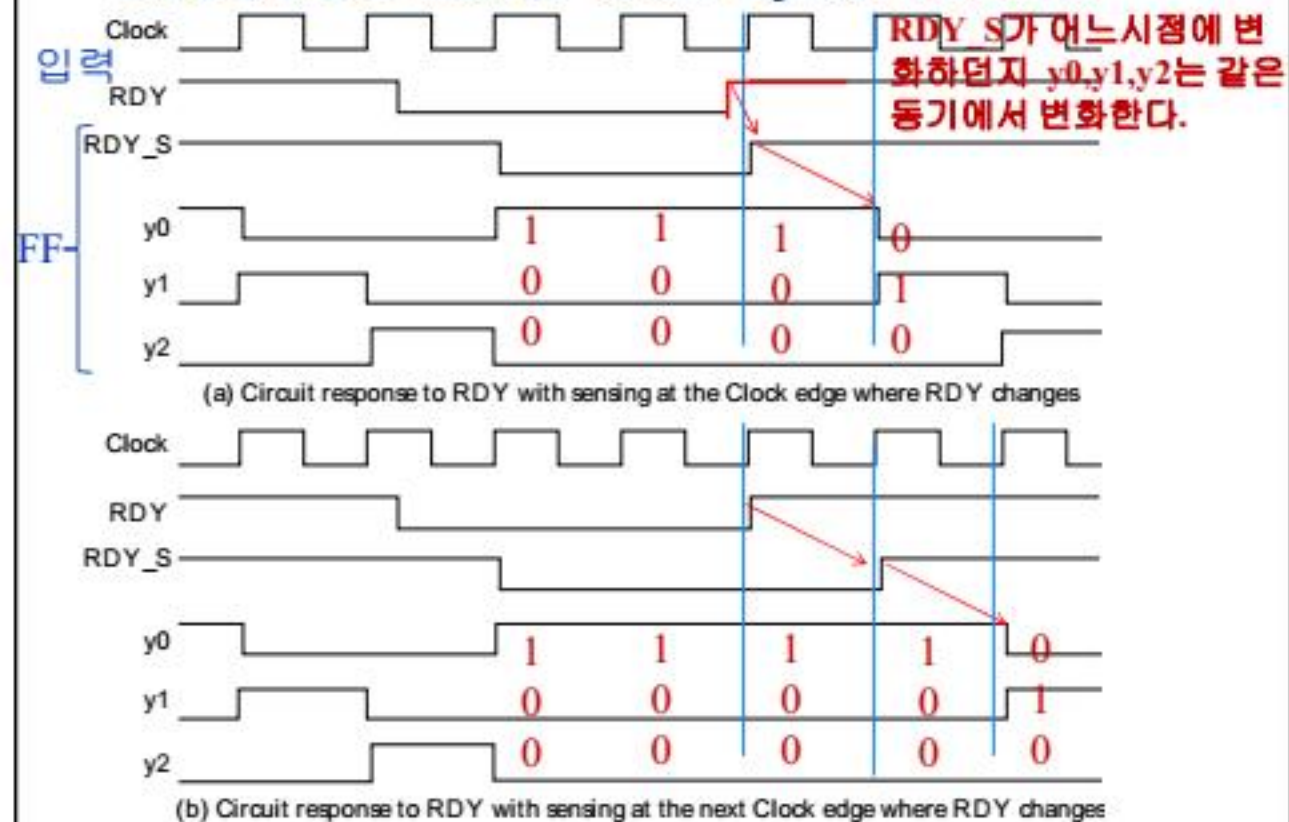
Solution using Synchronizers p.258

- 해법 : RDY 입력을 동기화한다.



11

Circuit Behavior with Synchronizer



12

정리

- clock과 FF 타이밍
- 순차 회로의 타이밍 이해
- 비동기 입력에 대한 동기식 회로의 문제점과 해결
 - Synchronizer (FF)