28 Lecture - CS302

Important Mcqs

1. **In a synchronous decade counter, how many flip-flops are used?**
   a) 4
   b) 6
   c) 8
   d) 10
   Answer: d) 10

   What is the maximum count of a synchronous decade counter?
   a) 5
   b) 9
   c) 10
   d) 16
   Answer: c) 10

   What is the clock signal frequency required for a synchronous decade counter to count at 1 Hz?
   a) 1 kHz
   b) 10 kHz
   c) 100 kHz
   d) 1 MHz
   Answer: b) 10 kHz

   How many clock cycles are required for a synchronous decade counter to count from 0 to 5?
   a) 3
   b) 5
   c) 10
   d) 16
   Answer: b) 5

   What is the purpose of the carry output in a synchronous decade counter?
   a) to indicate when the counter has reached its maximum count
   b) to provide a clock signal for the next stage of the counter
   c) to reset the counter to its initial value
   d) to enable/disable the counter
   Answer: b) to provide a clock signal for the next stage of the counter

   What is the relationship between the clock signal and the flip-flop outputs in a synchronous decade counter?
   a) they are always in phase with each other
   b) they are always out of phase with each other
   c) they are in phase during the count up and out of phase during the count down
   d) they are out of phase during the count up and in phase during the count down
   Answer: a) they are always in phase with each other

   What is the timing relationship between the flip-flop outputs in a synchronous decade

counter?
a) they change state simultaneously on the rising edge of the clock signal
b) they change state simultaneously on the falling edge of the clock signal
c) they change state sequentially on the rising edge of the clock signal
d) they change state sequentially on the falling edge of the clock signal
Answer: c) they change state sequentially on the rising edge of the clock signal

What is the timing relationship between the carry output and the flip-flop outputs in a synchronous decade counter?
a) the carry output is always one clock cycle ahead of the flip-flop outputs
b) the carry output is always one clock cycle behind the flip-flop outputs
c) the carry output and the flip-flop outputs change state simultaneously
d) the carry output and the flip-flop outputs change state alternately
Answer: b) the carry output is always one clock cycle behind the flip-flop outputs

What is the maximum frequency of a synchronous decade counter with a 50 ns propagation delay per flip-flop?
a) 20 kHz
b) 50 kHz
c) 100 kHz
d) 200 kHz
Answer: c) 100 kHz

How many clock cycles are required for a synchronous decade counter to count from 9 to 0?
a) 1
b) 9
c) 10
d) 20
Answer: c) 10