

M T W T F S

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What is a synchronizer?

In computer science, a synchronizer is an algorithm that can be used to run a synchronous algorithm on top of an asynchronous algorithm on processor, network, so enabling the asynchronous system to run as a synchronous network.

It is a digital circuit that converts an asynchronous signal, a signal from a different clock domain into the recipient clock domain so that it can be captured without introducing any metastability failure.

20- What is minimum no. of bits that can be added using a full adder?

A full adder is a combinational circuit that performs that adds 2 bits & a carry & outputs a sum bit & a carry bit.

→ Two 1's with no carry-in are added using a full adder. Any no. of half & full adder cells can be connected together to form an n-bit addition.

21- What are synchronous sequential circuits?

They are digital sequential circuits in which the feedback to the input for next output generation is governed by clock signals.

They are used in counters, shift registers & memory units.

22- A flip-flop copies input to output on which edge of the clock?

On the trailing edge of the clock signal (HIGH-to-LOW) the 2<sup>nd</sup> "slave" stage is now activated, latching on to the output from the 1<sup>st</sup> master circuit. Then the output stage appears to be triggered on the -ve edge of the clock pulse.

- what are arithmetic circuits?

An arithmetic circuit is a set of gates with a separate set of inputs for each no. that has to be processed. The gates are connected so as to carry out an arithmetic action & the outputs of the gate circuit are the digits of the result (addition, subtraction, multiplication, or division).

a - what is propagation delay?

Propagation delay is the length of time taken for a signal to reach its destination. It can relate to networking, electronics or physics. Hold time is the minimum interval required for the logic level to remain on the input after triggering edge of the clock pulse.

In electronics, digital circuits & digital electronics, the propagation delay, or gate delay, is the length of time which starts when the input to a logic gate becomes stable & valid to change to the time that that the output of that logic gate is stable & valid to change.

that the literals represent the fixed values that cannot be modified. It also contains memory but does not have references as variables.

Example:

`const int = 10;` is a constant integer expression in which 10 is an integer literal

16- what are decoders?

A decoder is a circuit which has  $n$  inputs &  $2^n$  outputs,  $\Sigma_1$  outputs 1 on the wire corresponding to the binary no: represented by the inputs.

Example:

A 2-4 decoder might be drawn like this:

& its truth table (again, really 4 truth tables, one for each output) is :

17- what are priority circuits?

A priority encoder is a circuit or algorithm that compresses multiple binary inputs into a smaller no: of outputs. They are often used to control interrupt request by acting on the highest priority interrupt input.

logic, whose output is a function of only the present input.

- 11- In which type of logic circuits, output depends on prior inputs?

In automata theory, sequential logic is type of logic circuit whose output depends not only on the present value of its input signals but on the sequence of past inputs, the input history as well.

This is in contrast to combinational logic, whose output is a function of only the present input.

- 12- what are the inputs of a flip-flop?

The normal data inputs to a flip flop (D, S & R, or J & K) are referred to as synchronous inputs because they have an effect on the outputs ( $Q$  &  $\text{not}-Q$ ) only in step, or in sync, with the clock signal transitions.

- 13- what are literals?

Literals are the constant values assigned to the constant variables. We can say

the system to shift from one location to the next.

- b- What is maximum no: of bits that can be added using a half adder?

The half adder adds two one-bit binary numbers (A,B). The output is the sum of the two bits(S) & the carry(C).

- a- A divide-by-N counter has how many inputs?

This type of counter circuit used for frequency division is commonly known ... used as asynchronous divide-by-n counters they are able to divide these input

- d- what are the inputs of a sequential logic circuit?

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- 5- Pushing a bubble from the output back to the inputs puts bubbles on which of the gate inputs?

Pushing bubbles backward (from the output) or forward (from the inputs) changes the body of the gate from AND to OR or vice versa. Pushing a bubble from the output back to the inputs puts bubbles on all gate inputs.

- 6- What is contamination delay?

The contamination delay of a circuit is defined as the shortest delay from when the inputs change to when the outputs begin to change, or when the outputs are no longer guaranteed to be holding their previous stable value.

- 7- What we call to a group of flip flops sharing a common clock?

A shift register is a type of digital circuit using a cascade of flip-flops where the output of one flip-flop is connected to the input to the input of the next. They share a single clock signal, which causes the data stored in

A Boolean function is represented by what?

It is described by an algebraic expression  
consists of binary variable, constants such as 0 & 1, and the logic operation symbols. An example of a Boolean function is this,  
 $f(a,b,c) = ab - c$ . These functions are implemented with the logic gates.

→ 2 - Define identity theorem.

→ In real analysis & complex analysis, branches of mathematics, the identity theorem for analytic functions states -  
A theorem for regular complex functions:  
given 2 regular functions  $f \& g$  on a connected open set  $D$ , if  $f=g$  on some neighbourhood of  $z$  that is in  $D$ , then  $f=g$  on  $D$ .

u - what are glitches in digital circuits?

These unwanted transitions, called "glitches", result when an input signal changes state provided the signal takes 2 or more paths through a circuit & one path has a longer delay than the other ~~path~~. The increased delay on one path can cause a glitch when the signal paths are recombined at an output gate.