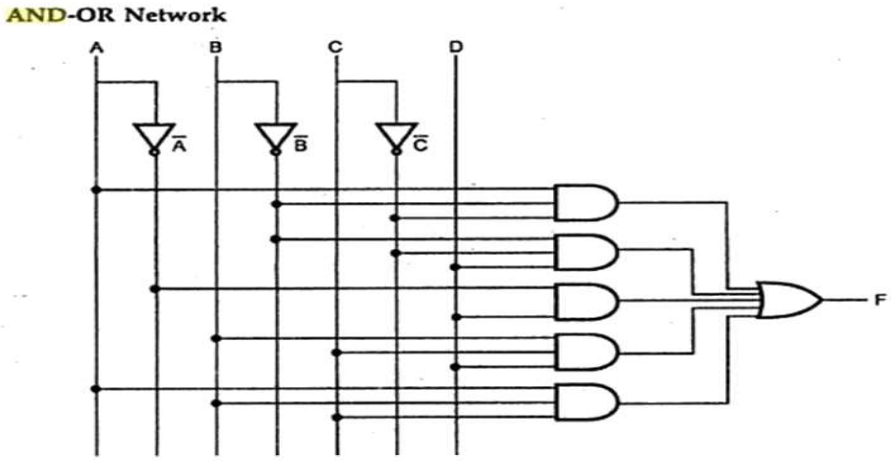

2 MARKS

1. **What is fundamental mode sequential circuit?**
   (or)
   Define fundamental mode sequential circuit
   a. input variables changes if the circuit is stable
   b. inputs are levels, not pulses
   c. only one input can change at a given time

2. **What is pulse mode circuit?**
   (or)
   Define pulse mode circuit
   a. inputs are pulses
   b. width of pulses are long for circuit to respond to the input
   c. pulse width must not be so long that it is still present after the new state is reached

3. **What is non critical race?**
   (or)
   Define non critical race
   final stable state does not depend on the order in which the state variable changes
   race condition is not harmful

4. **What is critical race?**
   (or)
   Define critical race
   final stable state depends on the order in which the state variable change
   race condition is harmful

5. **What are the steps for the design of asynchronous sequential circuit?**
   (or)
   Write steps for the design of asynchronous sequential circuit
   a. construction of primitive flow table
   b. reduction of flow table
   c. state assignment is made
   d. realization of primitive flow table

6. **What is hazard?**
   (or)
   Define hazard
   -unwanted switching transients

7. **What is static 1 hazard?**
   (or)
   Define static 1 hazard
   -output goes momentarily 0 when it should remain at 1

8. **What are static 0 hazards?**
   (or)
   Define static 0 hazard
   -output goes momentarily 1 when it should remain at 0

9. **What is dynamic hazard?**
   (or)
   Define dynamic hazard
   -output changes 3 or more times when it changes from 1 to 0 or 0 to 1

10. **What is combinational circuit?**
    (or)
    Define combinational circuit
    Output depends on the given input. It has no storage element.

11. **Define merger graph.**
    (or)
    What is merger graph?
    The merger graph is defined as follows. It contains the same number of vertices as the state table contains states. A line drawn between the two state vertices indicates each compatible state pair. It two states are incompatible no connecting line is drawn.

12. **Define state table**.
    (or)
    What is state table?
    For the design of sequential counters we have to relate present states and next states. The table, which represents the relationship between present states and next states, is called state table.

13. **Define total state.**
(or)
What is total state?

The combination of level signals that appear at the inputs and the outputs of the delays define that is called the total state of the circuit.

14. **What are the steps for the design of asynchronous sequential circuit?**
(or)
Write the design procedure for asynchronous sequential circuit

a. Construction of a primitive flow table from the problem statement.
b. Primitive flow table is reduced by eliminating redundant states using the state reduction State assignment is made
c. The primitive flow table is realized using appropriate logic elements.

15. **Define primitive flow table**:
(or)
What is primitive flow table?

It is defined as a flow table which has exactly one stable state for each row in the table. The design process begins with the construction of primitive flow table.

16. **What are the types of asynchronous circuits?**

Fundamental mode circuits
Pulse mode circuits

17. **What are races?**
(or)
Define races

When 2 or more binary state variables change their value in response to a change in an input variable, race condition occurs in an asynchronous sequential circuit. In case of unequal delays, a race condition may cause the state variables to change in an unpredictable manner.

18. **Define non critical race.**
(or)
What is non critical race?

If the final stable state that the circuit reaches does not depend on the order in which the state variable changes, the race condition is not harmful and it is called a non critical race.

19. **Define critical race?**
(or)
What is critical race?

If the final stable state depends on the order in which the state variable changes, the race condition is harmful and it is called a critical race.

20. **What is a cycle?**
(or)
Define cycle

A cycle occurs when an asynchronous circuit makes a transition through a series of unstable states. If a cycle does not contain a stable state, the circuit will go from one unstable to stable to another, until the inputs are changed.

21. **List the different techniques used for state assignment**.
(or)
Write the types of state assignment technique
Shared row state assignment
One hot state assignment

22. **Write a short note on fundamental mode asynchronous circuit.**
(or)
Define fundamental mode asynchronous circuit
Fundamental mode circuit assumes that. The input variables change only when the circuit is stable. Only one input variable can change at a given time and inputs are levels and not pulses.

23. **Write a short note on pulse mode circuit**.
(or)
Define pulse mode asynchronous circuit
Pulse mode circuit assumes that the input variables are pulses instead of level. The width of the pulses is long enough for the circuit to respond to the input and the pulse width must not be so long that it is still present after the new state is reached.

24. What is an asynchronous sequential circuit?
(or)
Define an asynchronous sequential circuit
The sequential circuits in which the change in input signals can affect memory element at any instant of time are called asynchronous sequential circuit.