MCQs

Easy Level (1-100)

1. What does RS stand for in RS Flip-Flops?

   - A) Reset Set
   - B) Random Set
   - C) Reset Start
   - D) Random Start

   Answer: A) Reset Set

2. Which of the following is a characteristic of a gated flip-flop?

   - A) It can be triggered by clock signals.
   - B) It does not have a control signal.
   - C) It is the same as an RS Flip-Flop.
   - D) It is only used in synchronous circuits.

   Answer: A) It can be triggered by clock signals.

3. How many stable states does an RS Flip-Flop have?

   - A) One
   - B) Two
   - C) Three
   - D) Four

   Answer: B) Two

4. What is the function of the enable input in a gated flip-flop?

   - A) It disables the flip-flop.
   - B) It controls data flow to the flip-flop.
   - C) It determines the clock frequency.
   - D) It sets the reset condition.

   Answer: B) It controls data flow to the flip-flop.

5. Which type of flip-flop changes its output on the edge of the clock signal?

   - A) RS Flip-Flop
   - B) Gated Flip-Flop
   - C) Edge Triggered Flip-Flop
   - D) Master-Slave Flip-Flop

   Answer: C) Edge Triggered Flip-Flop

6. What is a common application of shift registers?

   - A) Data storage
   - B) Data transmission
   - C) Counting

- D) All of the above
  Answer: D) All of the above

7. In a Master-Slave Flip-Flop, when does the slave flip-flop change state?

   - A) When the master flip-flop changes state.
   - B) On the falling edge of the clock.
   - C) On the rising edge of the clock.
   - D) It does not change state.
     Answer: B) On the falling edge of the clock.

8. What is the main advantage of synchronous counters over asynchronous counters?

   - A) Simplicity
   - B) Speed
   - C) Cost
   - D) Power consumption
     Answer: B) Speed

9. Which type of register holds data for a temporary period during processing?

   - A) Shift Register
   - B) Buffer Register
   - C) General Purpose Register
   - D) Accumulator
     Answer: C) General Purpose Register

10. What type of counter counts in binary and can roll over after reaching a certain count?

- A) Ripple Counter
- B) Johnson Counter
- C) Ring Counter
- D) Synchronous Counter
  Answer: A) Ripple Counter

Medium Level (101-300)

101. Which logic gate is primarily used in RS Flip-Flops?

- A) AND
- B) OR
- C) NAND
- D) NOR
  Answer: D) NOR

102. What happens when both inputs of an RS Flip-Flop are high?

- A) The output is set.
- B) The output is reset.
- C) It enters an undefined state.

- D) It remains unchanged.
  Answer: C) It enters an undefined state.

103. In a Gated D Flip-Flop, what does the D input represent?

- A) Data
- B) Delay
- C) Default
- D) Divide
  Answer: A) Data

104. Which flip-flop type is the most commonly used in digital circuits?

- A) RS Flip-Flop
- B) D Flip-Flop
- C) T Flip-Flop
- D) JK Flip-Flop
  Answer: B) D Flip-Flop

105. What is the purpose of the clock signal in flip-flops?

- A) To reset the flip-flop.
- B) To synchronize changes in output.
- C) To control data input.
- D) To enable data output.
  Answer: B) To synchronize changes in output.

106. How many flip-flops are needed to create a 4-bit binary counter?

- A) 2
- B) 3
- C) 4
- D) 5
  Answer: C) 4

107. What is the main disadvantage of asynchronous counters?

- A) They are more complex.
- B) They are slower.
- C) They require more power.
- D) They are less accurate.
  Answer: B) They are slower.

108. What is the output of a 2-bit binary synchronous counter when the input clock has been toggled three times?

- A) 00
- B) 01
- C) 10
- D) 11
  Answer: C) 10

109. Which type of shift register allows data to be shifted in both directions?

- A) Serial-In Serial-Out
- B) Parallel-In Parallel-Out
- C) Bidirectional Shift Register
- D) Universal Shift Register

Answer: C) Bidirectional Shift Register

110. In a Johnson counter, how many unique states are there for a 4-bit configuration?

- A) 4
- B) 8
- C) 12
- D) 16

Answer: C) 8

111. What does the 'T' in T Flip-Flop stand for?

- A) Toggle
- B) Timing
- C) Test
- D) Transmit

Answer: A) Toggle

112. Which of the following is true about edge-triggered flip-flops?

- A) They are only used in synchronous circuits.
- B) They change output on the clock's active edge.
- C) They do not have a clock input.
- D) They have a high power consumption.

Answer: B) They change output on the clock's active edge.

113. In a synchronous counter, how do the flip-flops operate?

- A) Sequentially
- B) Simultaneously
- C) Randomly
- D) In pairs

Answer: B) Simultaneously

114. What is the primary function of a register in digital circuits?

- A) To perform arithmetic operations
- B) To store data temporarily
- C) To generate clock signals
- D) To connect different circuits

Answer: B) To store data temporarily

115. In a D Flip-Flop, if the D input is high at the clock's rising edge, what will the output be?

- A) High

- B) Low
- C) Unchanged
- D) Undefined
  Answer: A) High

116. What is the primary advantage of using a master-slave flip-flop configuration?

- A) Simplicity
- B) Increased speed
- C) Elimination of race conditions
- D) Lower power consumption
  Answer: C) Elimination of race conditions

117. Which type of counter is also known as a "ring counter"?

- A) Johnson Counter
- B) Synchronous Counter
- C) Decade Counter
- D) Circular Counter
  Answer: D) Circular Counter

118. How many states does a 3-bit synchronous counter have?

- A) 3
- B) 6
- C) 8
- D) 16
  Answer: C) 8

119. In a 4-bit shift register, how many bits can be stored?

- A) 2
- B) 4
- C) 8
- D) 16
  Answer: B) 4

120. Which of the following is NOT a type of shift register?

- A) Serial-In Serial-Out
- B) Parallel-In Parallel-Out
- C) Circular Shift Register
- D) Linear Feedback Shift Register
  Answer: C) Circular Shift Register

Hard Level (301-440)

301. Which of the following circuits can be used to implement a D Flip-Flop?

- A) NAND Gates only
- B) NOR Gates only

- C) A combination of NAND and NOR Gates
- D) Only Inverters
  Answer: C) A combination of NAND and NOR Gates

302. What is the maximum count of a 3-bit asynchronous counter?

- A) 5
- B) 6
- C) 7
- D) 8
  Answer: C) 7

303. How does a synchronous counter differ from an asynchronous counter?

- A)

They do not use flip-flops.

- B) They have different counting speeds.
- C) All flip-flops are triggered by the same clock pulse.
- D) They use different types of registers.
  Answer: C) All flip-flops are triggered by the same clock pulse.

304. What is the primary purpose of a reset pin in a flip-flop?

- A) To initialize the output to a specific state
- B) To synchronize clock signals
- C) To control data inputs
- D) To change the flip-flop type
  Answer: A) To initialize the output to a specific state

305. In a master-slave D Flip-Flop, what is the main purpose of the master?

- A) To maintain the output state
- B) To sample the input D on the clock edge
- C) To reset the slave flip-flop
- D) To store the clock signal
  Answer: B) To sample the input D on the clock edge

306. Which of the following counters is known for counting in a non-binary sequence?

- A) Johnson Counter
- B) Ring Counter
- C) Decade Counter
- D) Up Counter
  Answer: C) Decade Counter

307. What type of counter is useful in applications requiring a specific counting sequence?

- A) Asynchronous Counter
- B) Johnson Counter

- C) Ripple Counter
- D) Up/Down Counter
  Answer: D) Up/Down Counter

308. How many unique states does a 4-bit Johnson counter have?

- A) 8
- B) 10
- C) 12
- D) 16
  Answer: C) 12

309. In which scenario would you prefer a D Flip-Flop over a JK Flip-Flop?

- A) When toggling is needed
- B) When the application is simpler
- C) When more memory is needed
- D) When complex triggering is required
  Answer: B) When the application is simpler

310. What is the primary disadvantage of a ripple counter?

- A) It is difficult to implement.
- B) It can introduce propagation delays.
- C) It cannot be cascaded.
- D) It has a limited counting range.
  Answer: B) It can introduce propagation delays.

311. Which type of shift register is primarily used in digital signal processing?

- A) Serial-In Serial-Out
- B) Universal Shift Register
- C) Parallel-In Parallel-Out
- D) Bidirectional Shift Register
  Answer: B) Universal Shift Register

312. What is the effect of a race condition in flip-flops?

- A) It improves speed.
- B) It causes indeterminate outputs.
- C) It enhances reliability.
- D) It reduces power consumption.
  Answer: B) It causes indeterminate outputs.

313. Which configuration allows a flip-flop to be reset or set with priority?

- A) Gated D Flip-Flop
- B) Master-Slave Flip-Flop
- C) Asynchronous Reset Flip-Flop
- D) T Flip-Flop
  Answer: C) Asynchronous Reset Flip-Flop

314. In a synchronous counter, what happens if the clock input is held high continuously?

- A) The counter resets.
- B) The counter holds its current value.
- C) The counter counts rapidly.
- D) The counter enters an undefined state.
  Answer: B) The counter holds its current value.

315. Which type of memory does a register typically use?

- A) Read-Only Memory
- B) Random Access Memory
- C) Flash Memory
- D) Magnetic Tape
  Answer: B) Random Access Memory

316. Which flip-flop configuration is least likely to suffer from race conditions?

- A) RS Flip-Flop
- B) D Flip-Flop
- C) T Flip-Flop
- D) JK Flip-Flop
  Answer: B) D Flip-Flop

317. What is the primary application of a shift register in communication systems?

- A) Data storage
- B) Data conversion
- C) Data synchronization
- D) Data transmission
  Answer: D) Data transmission

318. In digital design, which logic family is preferred for implementing counters and flip-flops?

- A) TTL
- B) CMOS
- C) ECL
- D) RTL
  Answer: B) CMOS

319. How many bits are required for a binary counter that counts up to 31?

- A) 4 bits
- B) 5 bits
- C) 6 bits
- D) 7 bits
  Answer: B) 5 bits

320. What is a common method to implement a decade counter?

- A) Using only flip-flops

- B) Using additional combinational logic
- C) Using asynchronous clock signals
- D) Using only shift registers
  Answer: B) Using additional combinational logic

321. Which type of counter is capable of counting both up and down?

- A) Ripple Counter
- B) Up Counter
- C) Down Counter
- D) Up/Down Counter
  Answer: D) Up/Down Counter

322. What does the "Q" output in a flip-flop signify?

- A) The set state
- B) The reset state
- C) The current output state
- D) The clock state
  Answer: C) The current output state

323. In a shift register, how many clock cycles are required to shift a single bit in?

- A) One
- B) Two
- C) Three
- D) Depends on the shift register type
  Answer: A) One

324. What is the function of the clear input in a flip-flop?

- A) To reset the output to zero
- B) To set the output to one
- C) To change the input state
- D) To enable the flip-flop
  Answer: A) To reset the output to zero

325. In synchronous counters, how does the counting sequence change?

- A) By changing the clock frequency
- B) By altering the flip-flop configuration
- C) By using different types of gates
- D) By adding more flip-flops
  Answer: B) By altering the flip-flop configuration

326. What is the primary disadvantage of using asynchronous flip-flops?

- A) They consume more power.
- B) They require more complex logic.
- C) They are slower due to propagation delay.

- D) They cannot be reset.
  Answer: C) They are slower due to propagation delay.

327. Which of the following is a common use for shift registers in digital circuits?

- A) Modulating signals
- B) Converting serial to parallel data
- C) Performing arithmetic operations
- D) Generating clock signals
  Answer: B) Converting serial to parallel data

328. In a 4-bit synchronous counter, what is the binary representation of the decimal number 10?

- A) 1010
- B) 1100
- C) 1001
- D) 1110
  Answer: A) 1010

329. What is the main purpose of the clock signal in flip-flops?

- A) To change the state of outputs
- B) To synchronize the operation of flip-flops
- C) To enable data inputs
- D) To control output levels
  Answer: B) To synchronize the operation of flip-flops

330. Which type of register allows data to be loaded in parallel and shifted serially?

- A) Serial-In Serial-Out
- B) Parallel-In Serial-Out
- C) Parallel-In Parallel-Out
- D) Serial-In Parallel-Out
  Answer: B) Parallel-In Serial-Out

331. What is the key advantage of a D Flip-Flop over an RS Flip-Flop?

- A) It is more complex.
- B) It is easier to use in applications requiring data storage.
- C) It can toggle outputs.
- D) It has more inputs.
  Answer: B) It is easier to use in applications requiring data storage.

332. Which component in a synchronous counter is responsible for providing the clock signal?

- A) Flip-Flops
- B) Combinational Logic
- C) External Clock Source
- D) Shift Registers
  Answer: C) External Clock Source

333. How many flip-flops are required to create a modulo-5 counter?

- A) 2
- B) 3
- C) 4
- D) 5

Answer: A) 3

334. Which type of counter can count in both binary and non-binary sequences?

- A) Ripple Counter
- B) Up Counter
- C) Johnson Counter
- D) Up/Down Counter

Answer: D) Up/Down Counter

335. In a Master-Slave

configuration, when does the slave flip-flop change state?

- A) At the clock's rising edge
- B) At the clock's falling edge
- C) When the master flip-flop changes state
- D) Both A and B

Answer: B) At the clock's falling edge

336. In a shift register, what happens to the bits during a shift operation?

- A) All bits are removed.
- B) Bits are moved to adjacent positions.
- C) Bits are multiplied.
- D) Bits are inverted.

Answer: B) Bits are moved to adjacent positions.

337. Which of the following is true about Johnson counters?

- A) They are limited to binary counting.
- B) They have more states than a ring counter with the same number of flip-flops.
- C) They only count in odd numbers.
- D) They require a complex configuration.

Answer: B) They have more states than a ring counter with the same number of flip-flops.

338. What is a common application of flip-flops in digital systems?

- A) Data transmission
- B) Frequency division
- C) Analog signal processing
- D) Power regulation

Answer: B) Frequency division

339. In a digital circuit, what is the purpose of a buffer register?

- A) To store data temporarily
- B) To amplify signals
- C) To convert data formats
- D) To perform logic operations
  Answer: A) To store data temporarily

340. In a synchronous counter, what is the role of combinational logic?

- A) To perform arithmetic operations
- B) To control data flow
- C) To determine the next state of the counter
- D) To provide the clock signal
  Answer: C) To determine the next state of the counter

341. What is the main advantage of using a T Flip-Flop in counters?

- A) It is simpler to design.
- B) It has more outputs.
- C) It can toggle its state.
- D) It requires less power.
  Answer: C) It can toggle its state.

342. Which of the following is NOT a characteristic of a Master-Slave Flip-Flop?

- A) It prevents race conditions.
- B) It has two stages of operation.
- C) It has a higher power consumption.
- D) It requires more components than a single flip-flop.
  Answer: C) It has a higher power consumption.

343. What happens to the output of an RS Flip-Flop when both inputs are low?

- A) The output is high.
- B) The output remains unchanged.
- C) The output is low.
- D) The output enters an undefined state.
  Answer: B) The output remains unchanged.

344. In an asynchronous counter, what triggers the counting process?

- A) A continuous clock signal
- B) Manual reset
- C) An external event
- D) A clock pulse on the first flip-flop
  Answer: D) A clock pulse on the first flip-flop

345. Which type of counter has the advantage of being simple to design but slower in operation?

- A) Synchronous Counter
- B) Asynchronous Counter
- C) Johnson Counter

- D) Decade Counter
  Answer: B) Asynchronous Counter

346. What is the maximum number of states for a 4-bit binary counter?

- A) 8
- B) 15
- C) 16
- D) 31
  Answer: C) 16

347. In a D Flip-Flop, what happens when the clock signal goes high and D is low?

- A) The output is set to high.
- B) The output is set to low.
- C) The output remains unchanged.
- D) The output enters an undefined state.
  Answer: B) The output is set to low.

348. Which type of register can load data simultaneously on all inputs?

- A) Shift Register
- B) Serial-In Serial-Out Register
- C) Parallel-In Parallel-Out Register
- D) Universal Shift Register
  Answer: C) Parallel-In Parallel-Out Register

349. How is a 2-bit Johnson counter different from a standard binary counter?

- A) It has more states.
- B) It counts in a different sequence.
- C) It has a single output.
- D) It requires more flip-flops.
  Answer: A) It has more states.

350. What is the primary function of an accumulator in digital circuits?

- A) To store binary data
- B) To perform arithmetic operations
- C) To amplify signals
- D) To generate clock signals
  Answer: B) To perform arithmetic operations.

351. In a digital design, what is the purpose of a reset function?

- A) To enable the clock
- B) To clear stored data
- C) To synchronize signals
- D) To amplify signals
  Answer: B) To clear stored data.

352. Which of the following describes a shift register's function?

- A) To perform logic operations
- B) To convert serial data to parallel data
- C) To temporarily hold data
- D) To amplify signals
  Answer: C) To temporarily hold data.

353. How many flip-flops are needed to create a counter that counts from 0 to 15?

- A) 3
- B) 4
- C) 5
- D) 6
  Answer: B) 4

354. Which flip-flop configuration has the ability to toggle its output?

- A) D Flip-Flop
- B) JK Flip-Flop
- C) RS Flip-Flop
- D) Edge Triggered Flip-Flop
  Answer: B) JK Flip-Flop

355. What is a key feature of a synchronous counter?

- A) It counts asynchronously.
- B) It is simpler than asynchronous counters.
- C) All flip-flops receive the clock pulse simultaneously.
- D) It cannot be reset.
  Answer: C) All flip-flops receive the clock pulse simultaneously.

356. In a shift register, what happens to the data when it is shifted out?

- A) It is permanently deleted.
- B) It is transferred to another register.
- C) It remains in the register.
- D) It is stored in memory.
  Answer: A) It is permanently deleted.

357. Which type of counter uses feedback to create a counting sequence?

- A) Ripple Counter
- B) Asynchronous Counter
- C) Johnson Counter
- D) Synchronous Counter
  Answer: C) Johnson Counter.

358. In digital electronics, what is the purpose of a latch?

- A) To synchronize data

- B) To store one bit of data
- C) To amplify signals
- D) To generate clock signals
  Answer: B) To store one bit of data.

359. What is the primary function of a clock signal in sequential circuits?

- A) To synchronize operations
- B) To increase processing speed
- C) To enable data flow
- D) To perform arithmetic operations
  Answer: A) To synchronize operations.

360. How does a Master-Slave Flip-Flop avoid race conditions?

- A) By using multiple inputs
- B) By delaying the output
- C) By separating the master and slave operations
- D) By increasing the clock frequency
  Answer: C) By separating the master and slave operations.

361. In a digital circuit, what role does a buffer play?

- A) To store data temporarily
- B) To amplify signals
- C) To filter noise
- D) To perform logic operations
  Answer: B) To amplify signals.

362. What is the primary purpose of a decade counter?

- A) To count in binary
- B) To count from 0 to 9
- C) To toggle outputs
- D) To shift data
  Answer: B) To count from 0 to 9.

363. Which flip-flop type can be used to create a toggle effect?

- A) D Flip-Flop
- B) T Flip-Flop
- C) RS Flip-Flop
- D) JK Flip-Flop
  Answer: B) T Flip-Flop.

364. In a synchronous circuit, how is data typically moved between registers?

- A) Using a single clock signal
- B) Using multiple clock signals
- C) Using manual control

- D) Using asynchronous timing
  Answer: A) Using a single clock signal.

365. What defines the number of states in a binary counter?

- A) The number of bits in the counter
- B) The clock frequency
- C) The type of flip-flop used
- D) The design of the circuit
  Answer: A) The number of bits in the counter.

366. In a shift register, which operation is performed when the clock signal is activated?

- A) Data is deleted.
  - B) Data is stored.
  - C) Data is shifted to the left or right.
  - D) Data is amplified.
    Answer: C) Data is shifted to the left or right.

367. Which type of flip-flop is most commonly used for data storage?

- A) T Flip-Flop
- B) JK Flip-Flop
- C) D Flip-Flop
- D) RS Flip-Flop
  Answer: C) D Flip-Flop.

368. In a digital counter, what does the term "modulus" refer to?

- A) The maximum number of states it can count
- B) The number of flip-flops used
- C) The clock frequency
- D) The type of logic used
  Answer: A) The maximum number of states it can count.

369. How does a T Flip-Flop toggle its output?

- A) On every clock cycle
- B) When the T input is high
- C) When the T input is low
- D) Based on external events
  Answer: B) When the T input is high.

370. Which component is essential for synchronizing multiple flip-flops in a circuit?

- A) Combinational Logic
- B) Clock Signal
- C) Latch
- D) Buffer
  Answer: B) Clock Signal.

371. In a synchronous counter, how does the output change?

- A) Based on external inputs
- B) Based on the clock signal and internal logic
- C) Randomly
- D) Based on the previous state only
  Answer: B) Based on the clock signal and internal logic.

372. Which type of register can both shift and store data?

- A) Shift Register
- B) Buffer Register
- C) Counter Register
- D) Latch
  Answer: A) Shift Register.

373. In a digital design, what does the term "glitch" refer to?

- A) A permanent fault in the circuit
- B) An unwanted short pulse
- C) A signal amplification
- D) A timing adjustment
  Answer: B) An unwanted short pulse.

374. Which type of flip-flop is most stable under noise?

- A) D Flip-Flop
- B) JK Flip-Flop
- C) RS Flip-Flop
- D) Edge Triggered Flip-Flop
  Answer: A) D Flip-Flop.

375. How can the propagation delay in flip-flops be minimized?

- A) By increasing the clock frequency
- B) By using faster flip-flops
- C) By reducing the number of stages
- D) By using a simpler logic design
  Answer: B) By using faster flip-flops.

376. In a counter, what does the term "ripple effect" refer to?

- A) A synchronous counting mechanism
- B) A delay in the change of outputs
- C) A feedback loop in the design
- D) A shift in data sequence
  Answer: B) A delay in the change of outputs.

377. What is the primary function of an edge-triggered flip-flop?

- A) To change state on a clock edge

- B) To maintain state indefinitely
- C) To amplify signals
- D) To filter noise
  Answer: A) To change state on a clock edge.

378. How does a shift register facilitate data transfer?

- A) By amplifying signals
- B) By converting data formats
- C) By sequentially moving data
- D) By synchronizing signals
  Answer: C) By sequentially moving data.

379. In a digital counter, what is the effect of cascading multiple counters?

- A) It decreases the counting range.
- B) It increases the counting range.
- C) It introduces more propagation delays.
- D) It simplifies the design.
  Answer: B) It increases the counting range.

380. What happens to the state of a JK Flip-Flop when both inputs are high?

- A) It resets to zero.
- B) It toggles its state.
- C) It maintains its previous state.
- D) It enters an undefined state.
  Answer: B) It toggles its state.

381. Which of the following describes the operation of a Johnson counter?

- A) It counts down.
- B) It uses a single feedback loop.
- C) It operates asynchronously.
- D) It has a fixed modulus.
  Answer: B) It uses a single feedback loop.

382. What is a common application of a D Flip-Flop?

- A) Frequency division
- B) Data storage
- C) Analog signal processing
- D) Amplifying signals
  Answer: B) Data storage.

383. In a synchronous design, what is the primary role of flip-flops?

- A) To perform arithmetic functions
- B) To store binary information
- C) To amplify signals

- D) To generate clock pulses
  Answer: B) To store binary information.

384. How many states does a 3-bit binary counter have?

- A) 4
- B) 7
- C) 8
- D) 6
  Answer: C) 8.

385. In a shift register, how is the data represented after a shift operation?

- A) As a single output
- B) In the same order as before
- C) In reversed order
- D) In a new sequence
  Answer: D) In a new sequence.

386. What distinguishes a synchronous counter from an asynchronous counter?

- A) Synchronous counters are faster.
- B) Synchronous counters use multiple clock signals.
- C) Synchronous counters update outputs simultaneously.
- D) Asynchronous counters have a simpler design. **Answer:** C) Synchronous counters update outputs simultaneously.

387. In a digital system, how is a latch different from a flip-flop?

- A) A latch is level-sensitive, while a flip-flop is edge-sensitive.
- B) A latch requires more power.
- C) A latch can store more data.
- D) A latch operates faster.
  Answer: A) A latch is level-sensitive, while a flip-flop is edge-sensitive.

388. How many unique states can a 4-bit binary counter represent?

- A) 15
- B) 16
- C) 14
- D) 13
  Answer: B) 16.

389. Which type of shift register can shift data in both directions?

- A) Serial-In Serial-Out
- B) Bidirectional Shift Register
- C) Parallel-In Parallel-Out
- D) Universal Shift Register
  Answer: B) Bidirectional Shift Register.

390. What is a common method to create a 4-bit synchronous counter?

- A) Using D Flip-Flops
- B) Using RS Flip-Flops
- C) Using T Flip-Flops
- D) Using JK Flip-Flops
  Answer: A) Using D Flip-Flops.

391. In a digital counter, what does the term "counting sequence" refer to?

- A) The order in which the states are accessed
- B) The maximum value the counter can reach
- C) The number of bits in the counter
- D) The frequency of the clock signal
  Answer: A) The order in which the states are accessed.

392. What happens to the output of a T Flip-Flop when the T input is low?

- A) It toggles its state.
- B) It remains in the same state.
- C) It resets to zero.
- D) It enters an undefined state.
  Answer: B) It remains in the same state.

393. Which of the following is a characteristic of an RS Flip-Flop?

- A) It has two outputs only.
- B) It is triggered by the clock.
- C) It cannot enter a forbidden state.
- D) It can have multiple inputs.
  Answer: A) It has two outputs only.

394. What is the primary purpose of a toggle flip-flop?

- A) To count pulses
- B) To store data
- C) To change its state with each clock pulse
- D) To amplify signals
  Answer: C) To change its state with each clock pulse.

395. How is the output of a JK Flip-Flop determined?

- A) By the J and K inputs
- B) By the clock signal only
- C) By the current state only
- D) By external inputs only
  Answer: A) By the J and K inputs.

396. In a counter, what is the function of a carry-out signal?

- A) To indicate a reset condition

- B) To show the counter's current state
- C) To trigger the next counter stage
- D) To amplify the output
  Answer: C) To trigger the next counter stage.

397. Which type of flip-flop is used for edge

-triggered operation?

- A) D Flip-Flop
- B) JK Flip-Flop
- C) RS Flip-Flop
- D) T Flip-Flop
  Answer: A) D Flip-Flop.

398. How many clock cycles does it take for a 4-bit binary counter to count from 0 to 15?

- A) 4
- B) 15
- C) 16
- D) 14
  Answer: C) 16.

399. Which component is necessary for a counter to reset to zero?

- A) Control Signal
- B) Clock Signal
- C) Reset Signal
- D) Load Signal
  Answer: C) Reset Signal.

400. In a shift register, what is the purpose of a serial input?

- A) To load data in parallel
- B) To shift data out
- C) To feed data in one bit at a time
- D) To amplify signals
  Answer: C) To feed data in one bit at a time.