

Note: Take printout of these questions try to solve and tick answer by your own

1. Which of the following is NOT true for a combinational circuit?

- a) It has no memory elements
- b) The output depends only on the current input
- c) The output depends on past inputs
- d) More than one of the above
- e) None of the above

2. Which of the following is NOT a combinational circuit?

- a) Multiplexer
- b) Flip-Flop
- c) Decoder
- d) More than one of the above
- e) None of the above

3. Which gate is known as the universal gate?

- a) AND gate
- b) OR gate
- c) XOR gate
- d) More than one of the above
- e) None of the above

4. What is the function of a multiplexer?

- a) It selects one input from multiple inputs and forwards it
- b) It generates multiple outputs from a single input
- c) It stores binary data
- d) More than one of the above
- e) None of the above

5. Which of the following is a combinational circuit?

- a) Encoder
- b) Shift Register
- c) Flip-Flop
- d) More than one of the above
- e) None of the above

6. How many output lines does a 3-to-8 decoder have?

- a) 3
- b) 8
- c) 6
- d) More than one of the above
- e) None of the above

7. What is the primary use of an encoder?

- a) To perform addition
- b) To convert decimal to binary
- c) To convert multiple inputs into a single binary output
- d) More than one of the above
- e) None of the above

8. Which gate is used in the implementation of a full adder circuit?

- a) AND
- b) OR
- c) XOR
- d) More than one of the above
- e) None of the above

9. What is the output of a half adder when both inputs are 1?

- a) Sum = 1, Carry = 0
- b) Sum = 0, Carry = 1
- c) Sum = 1, Carry = 1
- d) More than one of the above
- e) None of the above

10. Which combinational circuit is used to perform binary addition?

- a) Multiplexer
- b) Decoder
- c) Adder
- d) More than one of the above
- e) None of the above

11. Which of the following is an application of a decoder?

- a) Arithmetic operations
- b) Address decoding in microprocessors
- c) Multiplexing
- d) More than one of the above
- e) None of the above

12. Which of the following statements is true for a combinational circuit?

- a) It has feedback loops
- b) It has no memory elements
- c) It depends on past inputs
- d) More than one of the above
- e) None of the above

13. Which combinational circuit can be used to convert binary information from n inputs to 2^n outputs?

- a) Multiplexer
- b) Decoder
- c) Encoder
- d) More than one of the above
- e) None of the above

14. A 4-bit parallel adder consists of how many full adders?

- a) 2
- b) 4
- c) 8
- d) More than one of the above
- e) None of the above

15. Which logic gate is used to invert a signal?

- a) AND
- b) OR
- c) NOT
- d) More than one of the above
- e) None of the above

16. How many select lines are needed for a 16-to-1 multiplexer?

- a) 2
- b) 4
- c) 5
- d) More than one of the above
- e) None of the above

17. Which of the following is used to design a combination lock circuit?

- a) Encoder
- b) Decoder
- c) Multiplexer
- d) More than one of the above
- e) None of the above

18. Which combinational circuit is used to implement a priority encoder?

- a) Multiplexer
- b) Demultiplexer
- c) Encoder
- d) More than one of the above
- e) None of the above

19. Which circuit generates a binary word at the output for each decimal digit at the input?

- a) Multiplexer
- b) Encoder
- c) Adder
- d) More than one of the above
- e) None of the above

20. A 4-to-1 multiplexer has inputs I0, I1, I2, I3, and select lines S0 and S1. If the select lines are S0 = 1 and S1 = 0, which input is selected?
- a) I0
 - b) I1
 - c) I2
 - d) More than one of the above
 - e) None of the above
21. What is the minimum number of 2-to-1 multiplexers required to implement a 4-to-1 multiplexer?
- a) 2
 - b) 3
 - c) 4
 - d) More than one of the above
 - e) None of the above
22. How many select lines are required for an 8-to-1 multiplexer?
- a) 2
 - b) 3
 - c) 4
 - d) More than one of the above
 - e) None of the above
23. How many half adders and full adders are required to add two 4-bit binary numbers?
- a) 1 Half Adder, 4 Full Adders
 - b) 4 Half Adders, 0 Full Adders
 - c) 1 Half Adder, 3 Full Adders
 - d) More than one of the above
 - e) None of the above
24. What is the primary difference between a multiplexer and a demultiplexer?
- a) Multiplexer selects one input; Demultiplexer routes one input to multiple outputs
 - b) Multiplexer routes one input to multiple outputs; Demultiplexer selects one input
 - c) Both perform the same operation
 - d) More than one of the above
 - e) None of the above
25. Which of the following combinational circuits can be used to implement a control system in a microprocessor?
- a) Encoder
 - b) Decoder
 - c) Multiplexer
 - d) More than one of the above
 - e) None of the above

26. In a 3-to-8 decoder, if the input is 101, which output line is activated?

- a) O2
- b) O5
- c) O7
- d) More than one of the above
- e) None of the above

27. Which of the following circuits can be used to convert parallel data into serial data?

- a) Encoder
- b) Multiplexer
- c) Shift Register
- d) More than one of the above
- e) None of the above

28. A 16-to-1 multiplexer requires how many select lines?

- a) 4
- b) 5
- c) 3
- d) More than one of the above
- e) None of the above

29. What is the logic expression for the output of a half-adder circuit?

- a) Sum = A AND B, Carry = A XOR B
- b) Sum = A XOR B, Carry = A AND B
- c) Sum = A OR B, Carry = A XOR B
- d) More than one of the above
- e) None of the above

30. Which combinational circuit is required to construct an Arithmetic Logic Unit (ALU)?

- a) Decoder
- b) Multiplexer
- c) Adder
- d) More than one of the above
- e) None of the above

31. Which circuit can be used to reduce the number of data lines in a digital communication system?

- a) Decoder
- b) Demultiplexer
- c) Encoder
- d) More than one of the above
- e) None of the above

32. What is the output expression of a 4-input AND gate?

- a) $A + B + C + D$
- b) $A \& B \& C \& D$
- c) $A \text{ XOR } B \text{ XOR } C \text{ XOR } D$
- d) More than one of the above
- e) None of the above

33. What is the Boolean expression for a full subtractor circuit's Difference output?

- a) $A \oplus B \oplus C$
- b) $A + B + C$
- c) $A \& B \& C$
- d) More than one of the above
- e) None of the above

34. Which combinational circuit is used to generate a binary code corresponding to the activated input line?

- a) Decoder
- b) Multiplexer
- c) Encoder
- d) More than one of the above
- e) None of the above

35. How many inputs are required for a 5-to-32 decoder?

- a) 5
- b) 32
- c) 7
- d) More than one of the above
- e) None of the above

36. Which circuit uses Boolean functions to generate a particular output?

- a) Multiplexer
- b) Arithmetic Circuit
- c) Comparator
- d) More than one of the above
- e) None of the above

37. Which of the following circuits is used to implement control applications like a traffic light controller?

- a) Multiplexer
- b) Encoder
- c) Decoder
- d) More than one of the above
- e) None of the above

38. In an 8-bit comparator circuit, what is the maximum number of outputs that can be active at any given time?

- a) 1
- b) 2
- c) 3
- d) More than one of the above
- e) None of the above

39. What is the role of a priority encoder in a system?

- a) Encodes the input signals
- b) Selects the input with the highest priority
- c) Decodes the input signals
- d) More than one of the above
- e) None of the above

40. What is the primary purpose of using a multiplexer in digital systems?

- a) To perform arithmetic operations
- b) To select a single line from multiple input lines
- c) To decode binary information
- d) More than one of the above
- e) None of the above

41. How many NAND gates are needed to construct an OR gate?

- a) 1
- b) 2
- c) 3
- d) More than one of the above
- e) None of the above

42. What is the total number of combinations that can be formed by a 4-to-2 priority encoder?

- a) 16
- b) 4
- c) 8
- d) More than one of the above
- e) None of the above

43. Which combinational circuit is best for error detection in digital communication?

- a) Adder
- b) Decoder
- c) Parity Checker
- d) More than one of the above
- e) None of the above

44. Which of the following is NOT true about multiplexers?

- a) They have multiple input lines and one output line
- b) They can perform parallel to serial data conversion
- c) They require select lines for operation
- d) More than one of the above
- e) None of the above

45. Which combinational logic circuit is used to implement a binary-to-Gray code converter?

- a) Encoder
- b) Decoder
- c) XOR gate network
- d) More than one of the above
- e) None of the above

46. How many 2-to-1 multiplexers are needed to implement a 2-to-4 decoder?

- a) 1
- b) 2
- c) 3
- d) More than one of the above
- e) None of the above

47. Which of the following represents the function of a demultiplexer?

- a) Many inputs to many outputs
- b) Single input to multiple outputs
- c) Multiple outputs to a single input
- d) More than one of the above
- e) None of the above

48. Which combinational circuit generates control signals based on a given instruction?

- a) Multiplexer
- b) Control Unit
- c) Decoder
- d) More than one of the above
- e) None of the above

49. In a 3-bit binary comparator, if $A = 101$ and $B = 011$, which output will be true?

- a) $A > B$
- b) $A < B$
- c) $A = B$
- d) More than one of the above
- e) None of the above

50. How many 1x16 demultiplexers are required to construct a 1x256 demultiplexer?

- a) 16
- b) 32
- c) 64
- d) More than one of the above
- e) None of the above

51. What is the primary purpose of a decoder in memory address decoding?

- a) To select a particular memory location
- b) To encode the input data
- c) To perform arithmetic operations
- d) More than one of the above
- e) None of the above

52. How many outputs does a 4-to-2 binary encoder have?

- a) 2
- b) 4
- c) 8
- d) More than one of the above
- e) None of the above

53. Which combinational circuit is used for generating parity bits in error detection?

- a) Adder
- b) XOR Gate
- c) Decoder
- d) More than one of the above
- e) None of the above

54. How many inputs are required for a 1-to-4 demultiplexer?

- a) 1
- b) 4
- c) 2
- d) More than one of the above
- e) None of the above

55. What is the primary difference between an encoder and a priority encoder?

- a) Encoder encodes all inputs, Priority Encoder encodes only the highest priority input
- b) Encoder selects inputs based on priority
- c) Both perform the same function
- d) More than one of the above
- e) None of the above

56. How many NAND gates are required to implement an XOR gate?

- a) 2
- b) 3
- c) 4
- d) More than one of the above
- e) None of the above

57. Which of the following circuits is best used for decision-making operations in CPUs?

- a) Multiplexer
- b) Comparator
- c) Decoder
- d) More than one of the above
- e) None of the above

58. In a 4-bit comparator circuit, if $A = 1001$ and $B = 1011$, which output will be high?

- a) $A > B$
- b) $A < B$
- c) $A = B$
- d) More than one of the above
- e) None of the above

59. How many NOT gates are required to construct a 4-input NOR gate?

- a) 1
- b) 2
- c) 4
- d) More than one of the above
- e) None of the above

60. Which combinational circuit is used to perform selection of operations in a digital computer?

- a) Multiplexer
- b) ALU
- c) Decoder
- d) More than one of the above
- e) None of the above

61. Which of the following devices use multiplexers to implement efficient logic designs?

- a) CPUs
- b) Memory Units
- c) I/O Controllers
- d) More than one of the above
- e) None of the above

62. What is the minimum number of NOR gates required to implement an AND gate?

- a) 1
- b) 2
- c) 3
- d) More than one of the above
- e) None of the above

63. Which of the following circuits can be used to reduce hardware complexity in logic designs?

- a) Multiplexer
- b) Demultiplexer
- c) Encoder
- d) More than one of the above
- e) None of the above

64. Which of the following circuits is used in the implementation of arithmetic units for addition and subtraction?

- a) Encoder
- b) Decoder
- c) Full Adder
- d) More than one of the above
- e) None of the above

65. How many outputs does a 3-to-8 decoder have?

- a) 3
- b) 8
- c) 6
- d) More than one of the above
- e) None of the above

66. Which combinational circuit is primarily used for routing signals in communication systems?

- a) Multiplexer
- b) Demultiplexer
- c) Decoder
- d) More than one of the above
- e) None of the above

67. How many OR gates are needed to construct a 4-input AND-OR-Invert circuit?

- a) 1
- b) 2
- c) 3
- d) More than one of the above
- e) None of the above

68. Which of the following circuits is used to combine multiple data sources into a single output line?

- a) Multiplexer
- b) Decoder
- c) Demultiplexer
- d) More than one of the above
- e) None of the above

69. What is the main advantage of using a priority encoder over a normal encoder?

- a) It simplifies circuit design
- b) It eliminates unwanted output codes
- c) It handles multiple high inputs correctly
- d) More than one of the above
- e) None of the above

70. In a 4-bit binary subtractor, what is the function of the borrow output?

- a) Indicates the result is negative
- b) Shows overflow in subtraction
- c) Carries the result to the next digit
- d) More than one of the above
- e) None of the above

71. How many full subtractors are needed to design an 8-bit binary subtractor?

- a) 4
- b) 8
- c) 7
- d) More than one of the above
- e) None of the above

72. What is the primary advantage of a carry look-ahead adder over a ripple carry adder?

- a) It has fewer logic gates
- b) It reduces propagation delay
- c) It simplifies circuit design
- d) More than one of the above
- e) None of the above

73. In a carry look-ahead adder, what is the function of the 'Generate' signal (G)?

- a) It indicates that a carry is generated by the current stage
- b) It indicates no carry is generated
- c) It represents the sum output
- d) More than one of the above
- e) None of the above

74. In a ripple carry adder, which bit position is updated last?

- a) The least significant bit (LSB)
- b) The most significant bit (MSB)
- c) The middle bit
- d) More than one of the above
- e) None of the above

75. Which circuit is most commonly used to avoid the delay issues in a ripple carry adder?

- a) Ripple Carry Adder
- b) Carry Look-Ahead Adder
- c) Half Adder
- d) More than one of the above
- e) None of the above

1. Answer: C) The output depends on past inputs

Explanation: This statement is not true because combinational circuits do not have memory; their output depends only on the current input, not on past inputs.

2. Answer: B) Flip-Flop

Explanation: A combinational circuit is one where the output depends only on the current inputs. Examples include multiplexers, decoders, and encoders. A flip-flop, however, is a sequential circuit, not a combinational one, because it has memory elements and its output depends on both current and past inputs.

3. Answer: E) None of the above

Explanation: NAND and NOR gates are known as universal gates because they can be used to create any other logic gate (AND, OR, NOT, XOR, etc.). Since NAND and NOR are not listed among the options (AND, OR, XOR), the correct answer is "None of the above."

4. Answer: A) It selects one input from multiple inputs and forwards it

Explanation: A multiplexer (MUX) selects one input from several inputs and forwards the selected input to a single output line. This functionality is different from demultiplexers or circuits that generate multiple outputs from a single input.

5. Answer: A) Encoder

Explanation: An encoder is a combinational circuit that converts information from 2^n inputs to an n -bit code. Shift registers and flip-flops are sequential circuits that involve memory and depend on past inputs.

6. Answer: B) 8

Explanation: A 3-to-8 decoder has 3 input lines and 8 output lines. For any decoder, the number of output lines is 2^n , where n is the number of input lines.

7. Answer: C) To convert multiple inputs into a single binary output

Explanation: An encoder takes multiple input signals and encodes them into a smaller number of bits (binary output). This is the opposite operation of a decoder.

8. Answer: D) More than one of the above (AND, OR, XOR are used)

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Explanation: A full adder circuit uses multiple gates, including XOR gates for sum calculation and AND and OR gates for carry-out computation. Hence, more than one type of gate is used.

9. Answer: B) Sum = 0, Carry = 1

Explanation: A half adder outputs a sum of 0 and a carry of 1 when both inputs are 1, since $1 + 1$ in binary results in 0 with a carry of 1.

10. Answer: C) Adder

Explanation: An adder is a combinational circuit that performs binary addition. A simple adder is used for adding two binary numbers, and more complex adders, like ripple-carry adders, can add multiple bits

11. Answer: B) Address decoding in microprocessors

Explanation: Decoders are widely used for address decoding in microprocessors to select specific memory locations based on address inputs.

12. Answer: B) It has no memory elements

Explanation: Combinational circuits do not have memory elements and their output depends only on the current input. They lack feedback loops and don't depend on past inputs.

13. Answer: B) Decoder

Explanation: A decoder takes n input lines and converts them to 2^n output lines, representing each possible input combination as a unique output line.

14. Answer: B) 4

Explanation: A 4-bit parallel adder requires 4 full adders, one for each bit position, to perform binary addition of two 4-bit numbers.

15. Answer: C) NOT

Explanation: The NOT gate is a basic logic gate that inverts its input signal; a high input (1) becomes low (0) and vice versa.

16. Answer: B) 4

Explanation: A 16-to-1 multiplexer requires 4 select lines because $2^4 = 16$, allowing for the selection of one input from 16 possible inputs.

17. Answer: B) Decoder

Explanation: A decoder is used to design combination lock circuits where a specific combination of inputs needs to activate a particular output.

18. Answer: C) Encoder

Explanation: A priority encoder is a type of encoder that encodes the highest-priority input among multiple active inputs, and it is itself a type of combinational circuit.

19. Answer: B) Encoder

Explanation: An encoder generates a binary output (word) corresponding to the input decimal digit. This is the primary function of an encoder.

20. Answer: B) I1

Explanation: A 4-to-1 multiplexer selects one of the four inputs (I0 to I3) based on the combination of the two select lines (S0 and S1). When $S1 = 0$ and $S0 = 1$, the multiplexer selects input I1.

21. Answer: B) 3

Explanation: To implement a 4-to-1 multiplexer using 2-to-1 multiplexers, you need three 2-to-1 multiplexers. Two multiplexers are used for the first stage to select between the inputs, and the third multiplexer is used to select between the outputs of the first stage.

22. Answer: B) 3

Explanation: An 8-to-1 multiplexer has 8 input lines and 1 output line. To select one input out of 8, 3 select lines are needed because $2^3 = 8$.

23. Answer: C) 1 Half Adder, 3 Full Adders

Explanation: For adding two 4-bit binary numbers, the least significant bit (LSB) can be added using a half adder (no carry-in). The remaining three bits require full adders because they need to account for the carry-in from the previous stage.

24. Answer: A) Multiplexer selects one input; Demultiplexer routes one input to multiple outputs

Explanation: A multiplexer (MUX) selects one input from several inputs and forwards it to a single output, while a demultiplexer (DEMUX) takes a single input and routes it to one of many outputs.

25. Answer: D) More than one of the above (Decoder and Multiplexer)

Explanation: Both decoders and multiplexers can be used in microprocessor control systems for tasks like instruction decoding and data routing.

26. Answer: B) O5

Explanation: A 3-to-8 decoder converts a 3-bit binary input into 8 outputs. If the input is 101 (binary for 5), the output O5 will be activated.

27. Answer: C) Shift Register

Explanation: A shift register is used to convert parallel data into serial data by shifting bits out one at a time in sequence.

28. Answer: A) 4

Explanation: A 16-to-1 multiplexer needs 4 select lines to select one out of the 16 input lines ($2^4 = 16$).

29. Answer: B) Sum = A XOR B, Carry = A AND B

Explanation: In a half-adder circuit, the sum output is the XOR of the two inputs (A XOR B), and the carry output is the AND of the two inputs (A AND B).

30. Answer: D) More than one of the above (Multiplexer and Adder)

Explanation: An ALU is constructed using multiple combinational circuits, including adders for arithmetic operations and multiplexers to select between different operations.

31. Answer: C) Encoder

Explanation: An encoder reduces the number of data lines by converting multiple inputs into a smaller number of outputs (binary coded).

32. Answer: B) A & B & C & D

Explanation: The output of a 4-input AND gate is the logical AND of all its inputs (A AND B AND C AND D).

33. Answer: A) $A \oplus B \oplus C$

Explanation: The difference output of a full subtractor is given by the XOR of the three inputs: A, B, and the borrow-in C.

34. Answer: C) Encoder

Explanation: An encoder generates a binary code corresponding to the activated input line.

35. Answer: A) 5

Explanation: A 5-to-32 decoder requires 5 input lines to produce 32 output lines ($2^5 = 32$).

36. Answer: D) More than one of the above (Multiplexer, Arithmetic Circuit)

Explanation: Both multiplexers and arithmetic circuits use Boolean functions to produce specific outputs based on inputs.

37. Answer: C) Decoder

Explanation: Decoders are commonly used in control applications such as traffic light controllers to control multiple outputs based on a specific input pattern.

38. Answer: A) 1

Explanation: In an 8-bit comparator circuit, only one output (e.g., $A > B$, $A = B$, or $A < B$) can be active at any given time.

39. Answer: B) Selects the input with the highest priority

Explanation: A priority encoder outputs the binary code of the highest-priority active input, ignoring lower-priority inputs.

40. Answer: B) To select a single line from multiple input lines

Explanation: A multiplexer is used to select one input from multiple inputs and forward it to a single output line.

41. Answer: B) 2

Explanation: An OR gate can be constructed using 2 NAND gates by first inverting both inputs and then passing them through a NAND gate.

42. Answer: C) 8

Explanation: A 4-to-2 priority encoder can form a total of 8 combinations, accounting for the combinations of inputs and their corresponding output code.

43. Answer: C) Parity Checker

Explanation: A parity checker is used for error detection in digital communication by checking the parity (even or odd) of a transmitted data set.

44. Answer: E) None of the above

Explanation: All the given statements (A, B, and C) are true about multiplexers, so the answer is "None of the above."

45. Answer: C) XOR gate network

Explanation: A binary-to-Gray code converter can be implemented using a network of XOR gates that converts binary input to its corresponding Gray code.

46. Answer: C) 3

Explanation: A 2-to-4 decoder has 2 input lines and 4 output lines. To implement this using 2-to-1 multiplexers:

A single 2-to-1 multiplexer can handle 2 outputs.

To implement 4 outputs, two 2-to-1 multiplexers are needed for the first stage to get 4 intermediate outputs.

Then, another 2-to-1 multiplexer is needed for the second stage to combine them properly.

Thus, a total of 3 multiplexers is needed.

47. Answer: B) Single input to multiple outputs

Explanation: A demultiplexer takes a single input and routes it to one of the many outputs based on the select line values.

48. Answer: C) Decoder

Explanation: A decoder is often used in control units to generate control signals based on binary input instructions. It activates specific output lines depending on the combination of inputs.

49. Answer: A) $A > B$

Explanation: For a binary comparator:

$A = 101$ (decimal 5) $B = 011$ (decimal 3)

Since $5 > 3$, the output for $A > B$ will be true.

50. Answer: A) 16

Explanation: A 1x16 demultiplexer splits a signal into 16 outputs. To achieve a 1x256 configuration: You need 16 such 1x16 demultiplexers, one for each of the 16 outputs, to further demultiplex each to 16 more outputs.

51. Answer: A) To select a particular memory location

Explanation: In memory systems, a decoder is used to select a specific memory location for reading or writing based on the address provided as input.

52. Answer: A) 2

Explanation: A 4-to-2 encoder has 4 input lines and encodes them into 2 output lines, representing the binary code of the activated input.

53. Answer: B) XOR Gate

Explanation: An XOR gate can generate parity bits by determining if there are an odd or even number of 1s in the data.

54. Answer: A) 1

Explanation: A 1-to-4 demultiplexer has a single input and 4 outputs, with select lines to route the input to one of the outputs.

55. Answer: A) Encoder encodes all inputs, Priority Encoder encodes only the highest priority input

Explanation: An encoder converts all input lines into a binary code, whereas a priority encoder does so only for the highest-priority input line that is active.

56. Answer: C) 4

Explanation: An XOR gate can be constructed using 4 NAND gates:

Two NAND gates for the initial inputs.

One NAND gate for the intermediate output.

One final NAND gate to get the XOR output.

57. Answer: B) Comparator

Explanation: A comparator circuit is used in decision-making processes to compare two values and decide which is greater, equal, or lesser.

58. Answer: B) $A < B$

Explanation: For a binary comparator: $A = 1001$ (decimal 9) $B = 1011$ (decimal 11)

Since $9 < 11$, the output for $A < B$ will be high.

59. Answer: D) More than one of the above (4 for inputs and 1 after OR gate)

Explanation: A 4-input NOR gate can be constructed using:

4 NOT gates to invert each input

1 additional NOT gate after an OR gate to invert the output

60. Answer: A) Multiplexer

Explanation: A multiplexer selects one of many inputs to be sent to the output, based on select lines, effectively enabling the selection of operations.

61. Answer: D) More than one of the above (CPUs, Memory Units, I/O Controllers)

Explanation: Multiplexers are widely used in CPUs, memory units, and I/O controllers to manage data flow efficiently.

62. Answer: C) 3

Explanation: An AND gate can be implemented using 3 NOR gates:

Two NOR gates for the inputs.

One NOR gate to combine the inverted inputs and invert the output.

63. Answer: A) Multiplexer

Explanation: Multiplexers can reduce hardware complexity by allowing the use of fewer gates for the same function through selection lines.

64. Answer: C) Full Adder

Explanation: A full adder circuit is specifically designed for arithmetic operations like addition and is used in building arithmetic units in computers.

65. Answer: B) 8

Explanation: A 3-to-8 decoder has 3 input lines and 8 output lines. It decodes the binary input to activate one of the 8 outputs.

66. Answer: D) More than one of the above (Multiplexer, Demultiplexer)

Explanation: Both multiplexers and demultiplexers are used to route signals in communication systems:

A multiplexer routes multiple inputs to a single output.

A demultiplexer routes a single input to multiple outputs.

67. Answer: A) 1

Explanation: To construct a 4-input AND-OR-Invert circuit:

You need one OR gate after combining two 2-input AND gates.

68. Answer: A) Multiplexer

Explanation: A multiplexer is designed to select one of many data sources and output it on a single line.

69. Answer: D) More than one of the above (B and C)

Explanation: A priority encoder:

Eliminates unwanted output codes.

Handles multiple high inputs correctly by prioritizing them.

70. A - Indicates the result is negative

71. B - 8

72. B - Reduces propagation delay

73. A - It indicates that a carry is generated by the current stage

74. B - The most significant bit (MSB)

75. B - Carry Look-Ahead Adder