1.What is the primary function of an A/D converter?
a) Convert analog signals to digital signals
b) Convert digital signals to analog signals
c) Store digital signals temporarily
d) Process digital signals

Answer: a) Convert analog signals to digital signals
Explanation: A/D converters, or Analog-to-Digital converters, are used to convert continuous analog signals into discrete digital representations.

2.Which type of A/D converter divides the analog input range into equally spaced intervals and assigns a digital code to each interval?
a) Flash converter
b) Successive approximation converter
c) Delta-sigma converter
d) Dual-slope converter

Answer: a) Flash converter
Explanation: Flash converters use a series of comparators to rapidly determine the input voltage level and assign a binary code to represent that voltage.

3.What is the purpose of a sample and hold circuit in A/D conversion?
a) To convert digital signals to analog signals
b) To store digital signals
c) To maintain the input voltage constant during the conversion process
d) To process analog signals

Answer: c) To maintain the input voltage constant during the conversion process
Explanation: Sample and hold circuits are used to sample the input analog signal and hold its value constant during the conversion process, ensuring accurate conversion.

4.What does a Voltage-to-Frequency converter do?
a) Converts voltage variations into frequency variations
b) Converts frequency variations into voltage variations
c) Converts voltage into digital signals
d) Converts frequency into digital signals

Answer: a) Converts voltage variations into frequency variations
Explanation: Voltage-to-frequency converters produce an output frequency proportional to the input voltage.

5.Which logic gate configuration is characteristic of a Schmitt trigger?
a) NOT gate
b) NAND gate
c) NOR gate
d) XOR gate

Answer: a) NOT gate
Explanation: Schmitt trigger is a type of comparator with hysteresis, often implemented using a NOT gate.

6.What is the main function of the IC 555 timer?
a) To perform analog-to-digital conversion
b) To generate precise time delays

c) To convert frequency to voltage
d) To perform logical operations

Answer: b) To generate precise time delays
Explanation: The IC 555 timer is primarily used to generate accurate time delays and oscillations.

7.Which logic family typically consumes the lowest power among TTL, PMOS, CMOS, and NMOS?
a) TTL
b) PMOS
c) CMOS
d) NMOS

Answer: c) CMOS
Explanation: CMOS logic family generally consumes the lowest power among the mentioned options.

8.What does TTL stand for?
a) Transistor-Transistor Logic
b) Transmitter-Transmitter Logic
c) Transformer-Transformer Logic
d) Transmit-Transmit Logic

Answer: a) Transistor-Transistor Logic
Explanation: TTL stands for Transistor-Transistor Logic, a type of digital circuitry built from bipolar junction transistors.

9.Which multivibrator circuit has only one stable state and generates a pulse of a specified duration?
a) Bistable
b) Monostable
c) Astable
d) Schmitt trigger

Answer: b) Monostable
Explanation: A monostable multivibrator circuit has only one stable state and produces a pulse of a predetermined duration when triggered.

10.Which type of logic uses voltage levels to represent logic states?
a) TTL
b) CMOS
c) PMOS
d) NMOS

Answer: b) CMOS
Explanation: CMOS (Complementary Metal-Oxide-Semiconductor) logic uses voltage levels to represent logic states, typically using low voltage for logic 0 and high voltage for logic 1.

11.In a dual-slope A/D converter, what is the role of the integrating capacitor?
a) To hold the input voltage constant
b) To store digital signals
c) To convert analog signals to digital signals
d) To measure the time taken for the voltage to reach zero

Answer: d) To measure the time taken for the voltage to reach zero
Explanation: The integrating capacitor in a dual-slope A/D converter is used to measure the time it takes for the voltage to return to zero during the integration phase.

12.What type of trigger does a Schmitt trigger use to switch its output?
a) Positive-going
b) Negative-going
c) Either positive-going or negative-going
d) None of the above

Answer: c) Either positive-going or negative-going
Explanation: Schmitt triggers can use either positive-going or negative-going input signals to switch their output states, depending on the configuration.

13.Which logic family uses depletion-mode transistors?
a) CMOS
b) NMOS
c) PMOS
d) TTL

Answer: c) PMOS
Explanation: PMOS (P-channel Metal-Oxide-Semiconductor) logic family uses depletion-mode PMOS transistors as the active element.

14.In which mode does a monostable multivibrator have two stable states?
a) High
b) Low

c) Neither high nor low
d) Both high and low

Answer: c) Neither high nor low
Explanation: A monostable multivibrator has only one stable state (neither high nor low) and one unstable state.

15.Which logic gate is formed by connecting two NAND gates in series?
a) AND gate
b) OR gate
c) XOR gate
d) NOR gate

Answer: a) AND gate
Explanation: By connecting two NAND gates in series, you effectively negate their outputs, creating an AND gate.

16.Which type of A/D converter requires more conversion time but has high accuracy?
a) Flash converter
b) Successive approximation converter
c) Dual-slope converter
d) Delta-sigma converter

Answer: c) Dual-slope converter
Explanation: Dual-slope converters typically require more conversion time but offer high accuracy.

17.What is the primary function of a Frequency-to-Voltage converter?

a) Converts voltage variations into frequency variations
b) Converts frequency variations into voltage variations
c) Converts voltage into digital signals
d) Converts frequency into digital signals

Answer: b) Converts frequency variations into voltage variations
Explanation: Frequency-to-voltage converters convert frequency variations into proportional voltage levels.

18.Which type of logic gate has an output that is the complement of its input?
a) OR gate
b) NOT gate
c) AND gate
d) NOR gate

Answer: b) NOT gate
Explanation: NOT gate produces an output that is the complement of its input.

19.Which logic gate configuration is characteristic of a TTL inverter?
a) NAND gate
b) NOR gate
c) AND gate
d) NOT gate

Answer: d) NOT gate
Explanation: TTL inverter is essentially a NOT gate, which produces the complement of its input.

20.In a bistable multivibrator, how many stable states does it have?
a) One
b) Two
c) Three
d) Four

Answer: b) Two
Explanation: Bistable multivibrators have two stable states, hence the name “bi” (meaning two) stable.

21.Which logic family is known for its high noise immunity and low power consumption?
a) TTL
b) CMOS
c) NMOS
d) PMOS

Answer: b) CMOS
Explanation: CMOS logic family is known for its high noise immunity and low power consumption.

22.What is the primary function of a Schmitt trigger?
a) To convert analog signals to digital signals
b) To generate stable frequency signals
c) To clean up noisy signals
d) To store digital signals

Answer: c) To clean up noisy signals

Explanation: Schmitt triggers are commonly used to clean up noisy signals by providing hysteresis.

23.Which logic family is characterized by the use of enhancement-mode transistors?
a) TTL
b) CMOS
c) NMOS
d) PMOS

Answer: c) NMOS
Explanation: NMOS (N-channel Metal-Oxide-Semiconductor) logic family uses enhancement-mode NMOS transistors as the active element.

24.Which multivibrator circuit generates a continuous square wave output?
a) Bistable
b) Monostable
c) Astable
d) Schmitt trigger

Answer: c) Astable
Explanation: Astable multivibrator continuously switches between its two unstable states, generating a square wave output.

25.What is the function of a Schmitt trigger in digital circuits?
a) To convert analog signals to digital signals
b) To stabilize the input voltage
c) To generate clock signals

d) To clean up noisy signals

Answer: d) To clean up noisy signals
Explanation: Schmitt triggers are commonly used to clean up noisy signals by providing hysteresis.

26.Which logic family has the highest speed among TTL, PMOS, CMOS, and NMOS?
a) TTL
b) PMOS
c) CMOS
d) NMOS

Answer: a) TTL
Explanation: TTL logic family typically has higher speed compared to PMOS, CMOS, and NMOS.

27.What is the purpose of a sample and hold circuit in analog-to-digital conversion?
a) To convert digital signals to analog signals
b) To store digital signals
c) To maintain the input voltage constant during the conversion process
d) To process analog signals

Answer: c) To maintain the input voltage constant during the conversion process
Explanation: Sample and hold circuits are used to sample the input analog signal and hold its value constant during the conversion process, ensuring accurate conversion.

28.Which logic gate configuration is characteristic of a TTL NAND gate?
a) OR gate

b) NOR gate
c) AND gate
d) NOT gate

Answer: c) AND gate
Explanation: A TTL NAND gate is essentially an AND gate followed by a NOT gate.

29.Which logic family is known for its compatibility with both TTL and CMOS?
a) PMOS
b) NMOS
c) CMOS
d) BiCMOS

Answer: d) BiCMOS
Explanation: BiCMOS (Bipolar CMOS) logic family is compatible with both TTL and CMOS logic levels.

30.Which of the following is not a type of multivibrator?
a) Bistable
b) Monofunctional
c) Astable
d) Schmitt trigger

Answer: b) Monofunctional
Explanation: Monofunctional is not a type of multivibrator. Bistable, Monostable, Astable, and Schmitt trigger are types of multivibrators.

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