1. Which logic family is known for its high-speed operation and low power consumption?

a) CMOS
b) TTL
c) ECL
d) Tristate TTL

Answer: a) CMOS

Explanation: CMOS (Complementary Metal-Oxide-Semiconductor) logic family is known for its high-speed operation and low power consumption due to the complementary nature of its transistors.

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2. What is the primary advantage of ECL (Emitter-Coupled Logic) over other logic families?

a) High noise immunity
b) Low power consumption
c) High-speed operation
d) Compatibility with TTL

Answer: c) High-speed operation

Explanation: ECL offers very high-speed operation compared to other logic families, making it suitable for applications where speed is critical, such as in high-frequency communication systems.

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3. What does TTL stand for in digital electronics?

a) Transistor-Transistor Logic
b) Time-Tested Logic
c) Tri-state Transistor Logic
d) Transformer-Temperature Logic

Answer: a) Transistor-Transistor Logic

Explanation: TTL stands for Transistor-Transistor Logic, a popular logic family characterized by its robustness and versatility in digital circuit design.

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4. What is the primary function of the fan-out parameter in digital logic gates?

a) It indicates the number of inputs a gate can accept.
b) It specifies the number of gates a single gate can drive.
c) It measures the noise margin of the gate.
d) It determines the propagation delay of the gate.

Answer: b) It specifies the number of gates a single gate can drive.

Explanation: Fan-out refers to the number of gate inputs that a single output of a gate can

drive without significantly degrading its performance.

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5. Which logic family is known for its high noise immunity and wide operating voltage range?

a) ECL
b) CMOS
c) TTL
d) Tristate TTL

Answer: b) CMOS

Explanation: CMOS (Complementary Metal-Oxide-Semiconductor) logic family offers high noise immunity and a wide operating voltage range, making it suitable for a variety of applications.

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6. What is the primary advantage of Tristate TTL gates over conventional TTL gates?

a) Higher speed
b) Lower power consumption
c) Greater flexibility in interfacing with other devices
d) Enhanced noise immunity

Answer: c) Greater flexibility in interfacing with other devices

Explanation: Tristate TTL gates offer an additional high-impedance state, providing greater flexibility in interfacing with other devices without causing contention on the bus.

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7. What is the primary purpose of the propagation delay in digital logic gates?

a) It measures the gate's operating temperature range.
b) It determines the gate's power consumption.
c) It specifies the time taken for a change at the input to result in a change at the output.
d) It measures the gate's fan-in capability.

Answer: c) It specifies the time taken for a change at the input to result in a change at the output.

Explanation: Propagation delay refers to the time taken for a signal to propagate through a gate from its input to its output. It is a crucial parameter in determining the speed performance of digital circuits.

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8. Which logic family is known for its compatibility with both TTL and CMOS devices?

a) ECL

b) Tristate TTL
c) CMOS
d) BiCMOS

Answer: d) BiCMOS

Explanation: BiCMOS (Bipolar Complementary Metal-Oxide-Semiconductor) logic family is known for its compatibility with both TTL and CMOS devices, offering advantages from both technologies.

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9. Which memory element retains its state as long as power is applied to it?

a) SRAM (Static Random-Access Memory)
b) DRAM (Dynamic Random-Access Memory)
c) EEPROM (Electrically Erasable Programmable Read-Only Memory)
d) ROM (Read-Only Memory)

Answer: a) SRAM (Static Random-Access Memory)

Explanation: SRAM retains its state as long as power is applied to it, making it suitable for storing data that needs to be accessed quickly and frequently.

10. What is the primary advantage of FPGA (Field-Programmable Gate Array) devices over ASICs (Application-Specific Integrated Circuits)?

a) Lower cost
b) Higher performance
c) Faster time-to-market
d) Greater power efficiency

Answer: c) Faster time-to-market

Explanation: FPGA devices offer faster time-to-market compared to ASICs because they can be reprogrammed or reconfigured after manufacturing, allowing for rapid prototyping and iterative development processes.