

Easy

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Consider the following statements regarding Combinational Logic: 1. Combinational circuits produce outputs based only on present input conditions without

A

1 and 2 only

Correct

B

2 and 3 only

C

1 and 3 only

D

1, 2 and 3

Correct Answer: A

Full Detailed Explanation

Correct Answer: A - 1 and 2 only

Quick Concept Explanation A useful classification test is whether the same present input can produce different outputs because of history. Adders, multiplexers, decoders and encoders are combinational; counters, registers and finite-state machines are sequential. Key relation: Combinational: $y(t)=f[x(t)]$. Sequential: $y(t)=f[x(t), \text{state}(t)]$, with $\text{state}(t+1)=g[x(t), \text{state}(t)]$. Exam focus: Ask one question: Does previous state matter? If no combinational. Common trap: Treating timing operation as proof that a circuit is combinational. Statement-wise Verification Statement 1 - Correct. Combinational circuits produce outputs based only on present input conditions without memory effect. Combinational output is a function only of present inputs. Statement 2 - Correct. These circuits do not include feedback paths or storage elements like flip-flops. In the standard definition: combinational circuits contain logic gates without memory elements such as latches/flip-flops; intentional feedback that stores state belongs to sequential behavior. Statement 3 - Incorrect. Sequential logic is a subset of combinational circuits used for timing operations. Sequential logic is not a subset of combinational logic; it adds state/memory and often clocking. Core Concept A useful classification test is whether the same present input can