Test 1 practice paper A (theory)

This assessment contains questions that allow partial credit. Dismiss

12 OF 12 QUESTIONS REMAINING

Test Content

Question 1

2 Points

For each of the following representations, is 2080 a **valid** number?

Binary = [ ]

Decimal = [ ]

Hexadecimal = [ ]

Octal? [ ]

Question 2

4 Points

Which of the following logical equivalences is defined by De Morgan's laws?

a) $\neg a \wedge (b \vee c) \equiv (\neg a \wedge b) \vee (\neg a \wedge c)$ [ ]

b) $\neg a \vee \neg b \vee \neg c \equiv \neg(a \wedge b) \vee \neg c$ [ ]

c) $\neg(a \vee b) \equiv \neg a \wedge \neg b$ [ ]

d) $a \vee 0 \equiv a$ [ ]

Question 3

3 Points

What are the values of the following unsigned binary numbers? Your answers should be decimal numbers, **using digits only**.

a) 0b0001 0000 = Enter answer

b) 0b1010 0001 = Enter answer

c) 0b0010 1010 = Enter answer

Question 4

5 Points

Which of the following statements are **true**?

a) SRAM is slower to access than DRAM.

b) NOR is the most popular functionally complete gate.

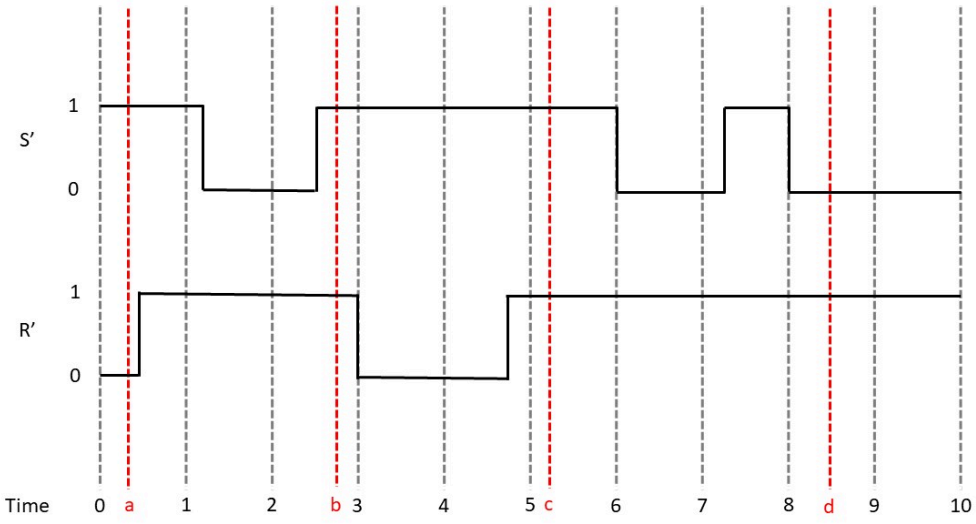
c) A flip-flop is edge-triggered.

d) Clock frequency is set independent of propagation delay.

e) A register only requires its load signal to be high to update the value stored.

Question 5

4 Points



For the above active-low R-S latch waveform, complete the following table for the output Q at the highlighted points in time:

Time	Q
a	

b	
c	
d	

Question 6

4 Points

ab \ cd	00	01	11	10
00	1	1	0	1
01	1	1	1	0
11	0	1	1	0
10	0	0	0	1

Which of the following Boolean expressions does the groups on the above Karnaugh map directly generate?

- **A.** (¬a ∧ ¬c) ∨ (b ∧ d) ∨ (¬b ∧ c ∧ ¬d) ∨ (¬a ∧ b ∧ ¬c ∧ d)
- **B.** (d ∨ b) ∧ (¬a ∨ ¬c) ∧ (¬b ∨ c ∨ ¬d)
- **C.** (b ∧ d) ∨ (a ∧ ¬b ∧ c ∧ ¬d) ∨ (¬a ∧ ¬c) ∨ (¬a ∧ ¬b ∧ c ∧ ¬d)
- **D.** (¬a ∨ ¬d) ∧ (¬b ∨ c ∨ ¬d) ∧ (d ∨ b)
- **E.** (b ∧ d) ∨ (¬b ∧ ¬d ∧ c) ∨ (¬c ∧ ¬a)
- **F.** None of the other options

Question 7

6 Points

What are the results of the following binary additions? Your answers should be 8-bit binary numbers **using digits only**.

a) 0b0000 1000 + 0b0101 0110 = 0b Enter answer

b) 0b0110 1001 + 0b0110 0101 = 0b Enter answer

c) 0b1001 1100 + 0b1011 1010 = 0b Enter answer

Question 8

6 Points

What is the frequency, in hertz, of a clock with the following time periods? Your answers should be decimal numbers **using digits and a decimal point, if necessary, only**.

a) 50µs = Enter answer Hz

b) 25ns = Enter answer Hz

c) 2s = Enter answer Hz

Question 9

4 Points

Suppose you're trying to calculate 94_{10} - 75_{10} in binary. What number completes this calculation below, assuming all binary values use 2's complement representation? Your answer should be an 8-bit binary number **using digits only**.

0b01011110 + 0b Enter answer

Question 10

6 Points

Complete the following sentence by selecting the correct options from each drop-down list:

For a CPU with 4 bytes of memory split into [ ], a multiplexer with a 2-bit select input is required to [ ] [ ] number.

Question 11

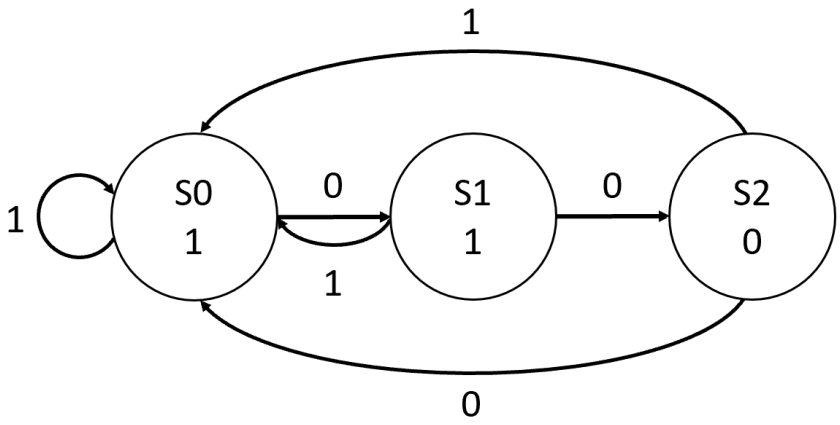
6 Points

A FSM has an input which represents whether a user has sucessfully completed a task (1 = successful, 0 = unsuccessful), and outputs 1 until the user is unsuccessful twice in a row. If the user is unsuccesful twice in a row then the FSM will output 0.

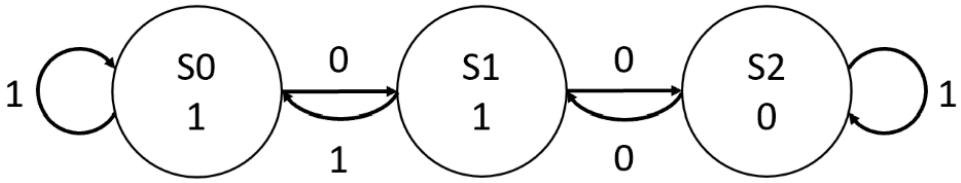
After ouputting 0, the FSM will output 1 until the user is unsuccessful twice in a row again e.g. if the user is unsuccessful three times in a row, the FSM will output 1, but if the user is unsuccessful four times in a row, the FSM will output 0.

Which of the following state diagrams could correctly represent the **Moore machine** of this system?

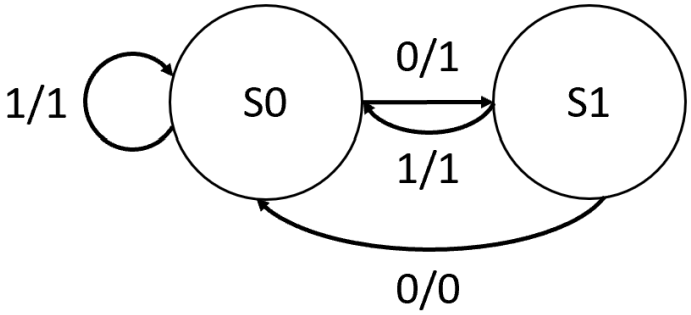
A.



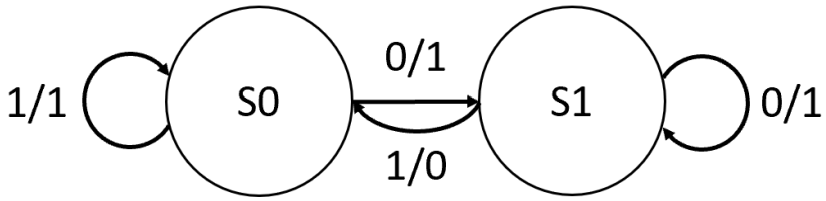
B.



C.



D.



E. None of the other options

Question 12

0 Points

Are there any questions in the test (in either the theory or practical component) where you weren't sure what the question meant, or where you think there might be a mistake in the question? If so, please give details and explain how you interpreted the question.

This question has no marks associated with it, and you should just leave it blank if the answer is "no".

Use the editor to format your answer

Questions Filter (12)

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