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# Unit 9 - Week 8: Organization and Optimization of Micro-programmed Controlled Control Unit

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Course outline

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## Assignment for Week 8

**The due date for submitting this assignment has passed.** **Due on 2019-03-27, 23:59 IST.**
**As per our records you have not submitted this assignment.**

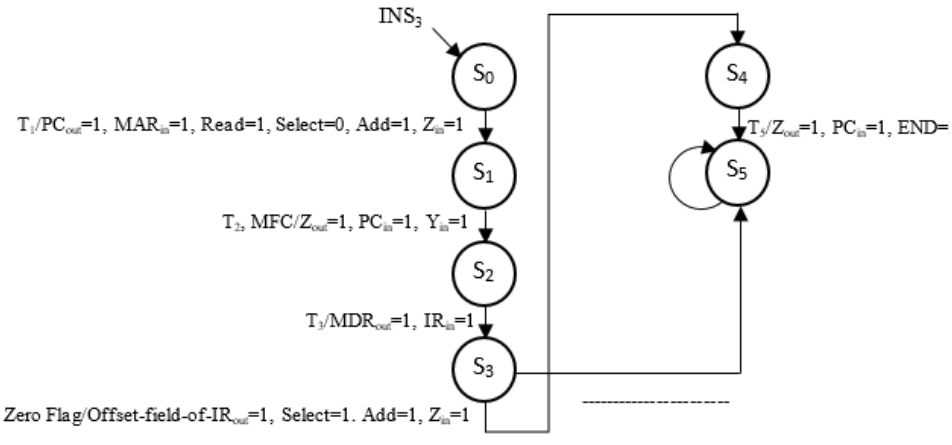
1) Which of the following is FALSE? ***1 point***

- In micro-programmed control unit, the logic of the control unit is specified by a code
- The hardware control unit is a Finite State Machine based controller
- Hardware control unit is faster in execution compared to micro-programmed control unit.
- None of the above

**No, the answer is incorrect.**
**Score: 0**

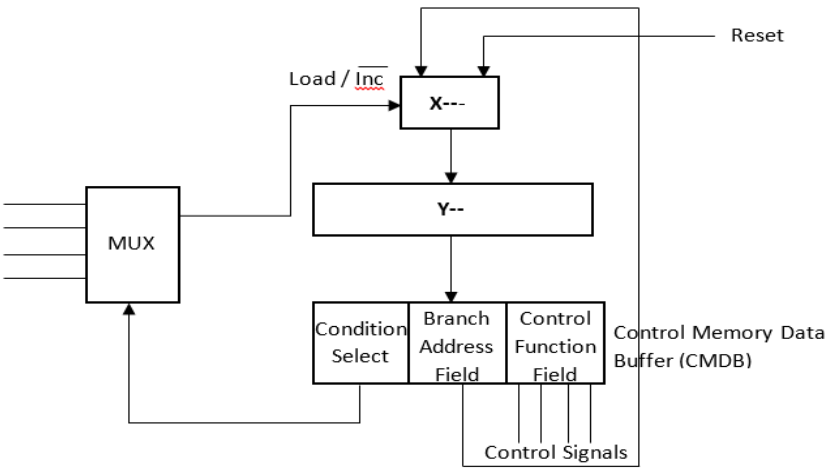
**Accepted Answers:**
*None of the above*

2) Given below is the FSM for the hardwired control unit for instruction JMPZ M (Jumps conditionally "if zero flag is set" to the instruction in memory location M i.e., update the value of PC to M). Which of the options given below appropriately labels the transition from S3 to S5 (marked as ------- in the figure). ***1 point***



**Accepted Answers:**
*If Zero Flag==0/ END=1*

3) Given below is the block diagram of organization of Micro-programmed Control Unit. Which of the options given below appropriately describe the blocks marked “X---” and “Y--”? ***1 point***




- X is “Condition Select” and X is “Multiplexer”
- X is “Program Counter” and X is “ALU”
- X is “Address Lines” and X is “General Purpose Register”
- X is “Micro Program Counter” and Y is “Control Memory”

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*X is “Micro Program Counter” and Y is “Control Memory”*

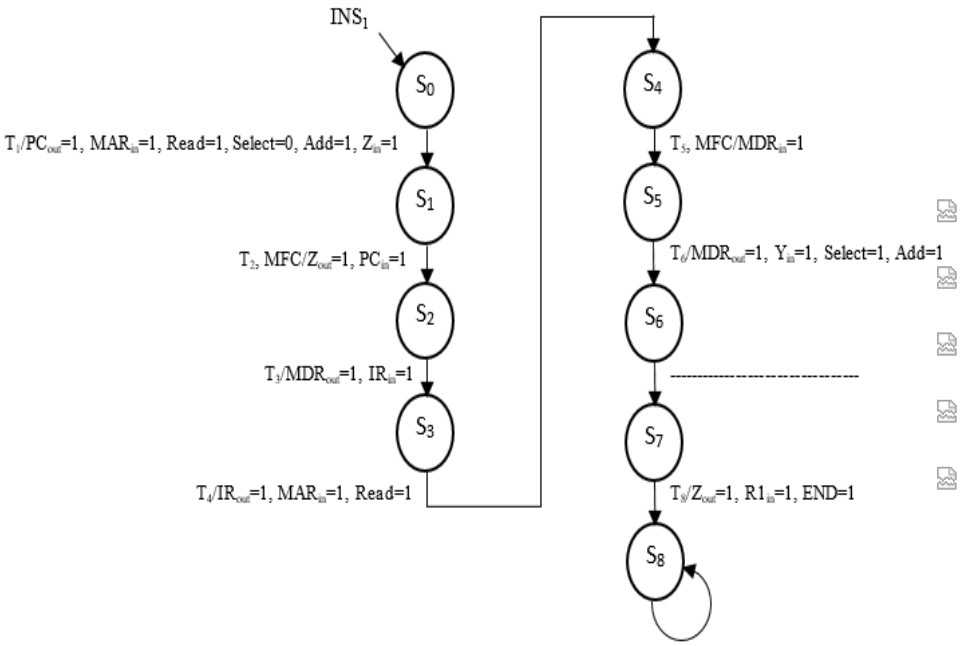
4) Which of the following statement is TRUE about Horizontal microprogram? ***1 point***

- Less micro-instructions enabling parallelism
- No encoding leading to higher speed
- Wide control function field
- All of the above

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*All of the above*

5) Given below is the FSM for the hardwired control unit for instruction “ADD R1, M” (where, M is a memory location) i.e., Add the content of Memory Location M to the content of Register R1 and the store the final result in R1. Which of the options given below appropriately labels the transition from S6 to S7 (marked as ------- in the figure). ***1 point***




- R1out=1, Yin=1
- R1in=1, Zout=1
- R1out=1, Zin=1
- All signals will have output 0

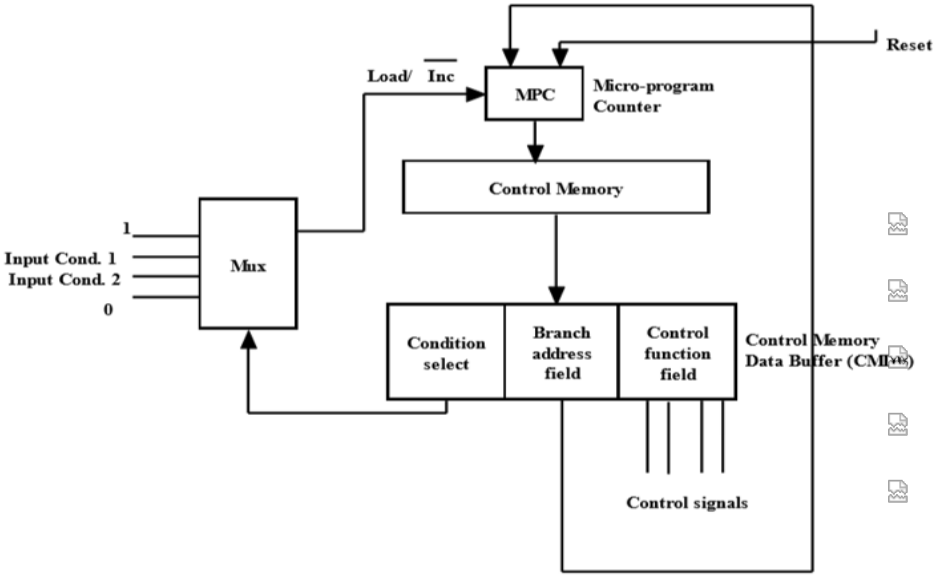
**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*R1out=1, Zin=1*

6) In the microprogrammed control unit, as shown below, let ***1 point***

1. PCout , MARin, Read, Select=0, Add, Zin
2. Zout , PCin , WMFC
3. MDRout, IRin

be the control signals required to fetch an instruction. Assume that Control Function field is 16 bits, Condition Select is 2 bits and Branch address filed is 2 bits. What would be the values in the condition select field in all the above three control steps?




- 01
- 00
- 10
- 11

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*11*

7) After the three control steps specified in the above question, the MPC is incremented to ***1 point***

- point to the word in the control memory that corresponds to t4, which corresponds to decoding the instruction.
- point to the word in the control memory that corresponds to t4, which corresponds to fetching the instruction.
- point to the word in the control memory that corresponds to t4, which corresponds to executing the instruction.
- None of the above

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*point to the word in the control memory that corresponds to t4, which corresponds to decoding the instruction.*

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