计算机组成 · quiz3

1. microprogram is stored in

单选题 (2.0 分) （难易度:中）

A. memory

B. stack

C. ROM

D. magnatic disk

2. use microprogram to implement controller, what is the right relation between machine instruction and microinstruction?

单选题 (2.0 分) （难易度:中）

A. one machine instruction is executed by one microinstruction

B. one machine instruction is executed by a section of (or one) microprogram

C. one microinstruction consists of severl machine instructions

D. a program composed of a section of instructions can be executed by one microinstruction.

3. right or wrong，correct it if it is wrong:
CPU is just a controller

简答题 (2.0 分) （难易度:中）

4. right or wrong，correct it if it is wrong:
In computer, each instruction cycle has same time length.

简答题 (2.0 分) （难易度:中）

5. Suppose the clock frequency of machine M is 2GHz，a user program P has 4000 million (4*10^9) instructions on M and CPI is 1.2. If the total time is 4s from program P starts until it finishes execution, what is the percentage of CPU time for P in total CPU time?

单选题 (2.0 分) （难易度:中）

A. 10%

B. 42%

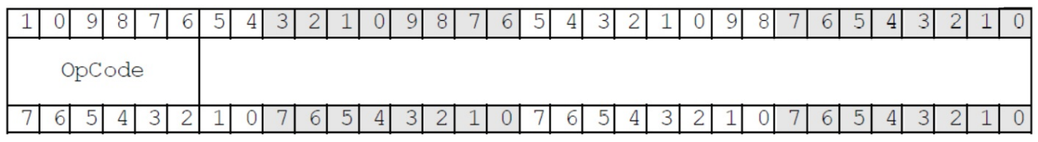
C. 60%

D. 100%

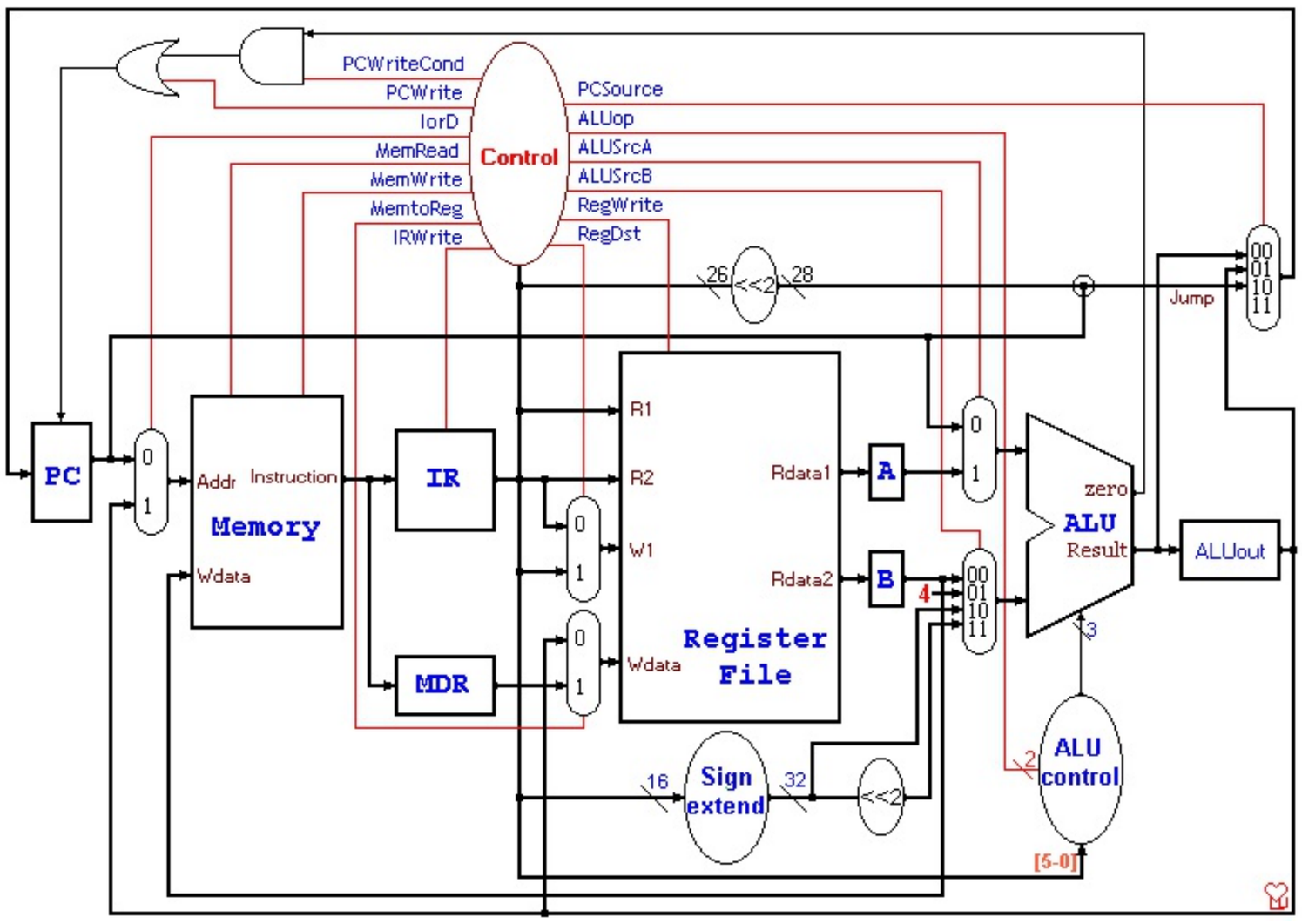
6. MIPS chooses to simplify the structure of its instructions. The way we implement complex instructions through the use of MIPS instructions is to decompose such complex instructions into multiple simpler MIPS ones. For example, instruction l_incr $rt,Address($rs) corresponds to the following two instructions:
lw $rs,L($rt)
addi $rt,$rt,1
If the implementation of this instruction in hardware will increase the clock period of a single-instruction implementation by 10%, what percentage of l_incr operations in the instruction mix would recommend implementing it in hardware?

简答题 (5.0 分) （难易度:中）

7. Design: In multicycle CPU implementation, add a register-memory instruction to the multicycle datapath:
Addm rd, rs, rt # rd = rs + Mem[rt]
write down the instruction format, add any necessary datapath and control signals to the Figure, and show the necessary modifications to the finite state machine. You can write down the solution on paper, take a picture and upload it.
1. instruction format



2. show what changes are needed to support addm in the multicycle datapath, include the new control signals. (You can just draw the modification part or describe it using text.)
3. write down the finite state machine diagram for the addm instruction with all control signals.



简答题 (15.0 分) （难易度:中）