

Unit 6 - Week 4

Course outline

How does an NPTEL online course work?

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Week 4

Introduction to Computer Architecture

The HACK Microarchitecture

The HACK CPU - A Deep Dive: Part 1

The HACK CPU - A Deep Dive: Part 2

The Data Memory

The HACK Computer

Quiz : Assignment 4

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Assignment 4

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-02-26, 23:59 IST.

1) The T bit in the 16-bit HACK instruction is used to determine

1 point

- If the instruction is A instruction or C instruction
- If the ALU uses value from A register or D register
- If the ALU uses value from A register or M register
- If the ALU uses value from A register or memory

No, the answer is incorrect. Score: 0

Accepted Answers: *If the instruction is A instruction or C instruction*

2) Find the 3 digit number $\{j_1, j_2, j_3\}$, which are present in the jump bits of JLE

No, the answer is incorrect. Score: 0

Accepted Answers: *(Type: Numeric) 110*

1 point

3) What HACK mnemonic will the given 16-bit HACK instruction translate to?

1 point

1011 1010 1000 1000

- @47752
- M = D
- M; JMP
- Wrong binary instruction

No, the answer is incorrect. Score: 0

Accepted Answers: *Wrong binary instruction*

4) The 16-bit output of PC should be connected to

1 point

- 16 bit HACK instruction input to CPU
- 16 bit data input to data memory
- 16 bit address input of instruction memory
- None of the above

No, the answer is incorrect. Score: 0

Accepted Answers: *16 bit address input of instruction memory*

5) In HACK microarchitecture, when a C instruction with $d_1 = 1, d_2 = 0, d_3 = 0, j_1 = j_2 = j_3 = 0$ executes, only the A register gets updated.

1 point

- True
- False

No, the answer is incorrect. Score: 0

Accepted Answers: *False*

6) Which of the following outputs can be generated by HACK ALU?

1 point

- M+1
- M-1
- A+M
- A+D

No, the answer is incorrect. Score: 0

Accepted Answers: *M+1
M-1
A+D*

7) Which of the following is(are) CORRECT about HACK CPU?

1 point

- Only write operation is supported for instruction memory.
- Both read and write operations are supported for data memory.
- Only read operation is supported for instruction memory.
- Both read and write operations are supported for instruction memory.

No, the answer is incorrect. Score: 0

Accepted Answers: *Both read and write operations are supported for data memory.
Only read operation is supported for instruction memory.*

8) Which of the following is(are) NOT valid HACK assembly instructions?

1 point

- A=M+1
- M=-2
- A=A+2
- D=-1

No, the answer is incorrect. Score: 0

Accepted Answers: *M=-2
A=A+2*

9) The following boolean function is given as input to load signal of PC. Which of the following statements is CORRECT?

1 point

$l_1 = j_2 \& z_r, l_2 = j_1 \& n_g, l_3 = j_3 \& (!z_r) \& (!n_g), l_4 = j_1 \& j_2 \& j_3$
 $load = T \& (l_1 | l_2 | l_3 | l_4)$

- 13 will be True for JGT if out > 0
- Without 14, the boolean function for load is still correct.
- 12 will be False for JNE if out < 0.
- 11 will be True for JLT if out = 0.

No, the answer is incorrect. Score: 0

Accepted Answers: *13 will be True for JGT if out > 0
Without 14, the boolean function for load is still correct.*

10) A C instruction writes a value to data memory. The address to which the value should be written, is used from which of the following?

1 point

- PC
- D register
- A register
- 15 bits except the T-bit of the current instruction

No, the answer is incorrect. Score: 0

Accepted Answers: *A register*