Started on	Monday, 27 March 2023, 1:16 AM
State	Finished
Completed on	Monday, 27 March 2023, 1:26 AM
Time taken	9 mins 35 secs
Marks	65.50/69.00
Grade	**94.93** out of 100.00

Question **1**

Correct

Mark 1.00 out of 1.00

When building a new chip in HDL each input pin of a part may be fed by:

Select one:

- a. An input pin of the chip
- b. One of the constants true and false (1 and 0)
- c. An output pin of the chip
- d. An internal pin
- e. All, except c. ✔

Question **2**

Correct

Mark 2.00 out of 2.00

The data structure used for representing the correspondence between symbols and their meaning is:

Select one:

- a. Queue
- b. Stack
- c. Hash Table ✔
- d. List

Question **3**

Correct

Mark 1.00 out of 1.00

A **counter** is combinational logic, that simply adds a constant (typically 1) to a given number.

Select one:

- True
- False ✔

Question **4**

Correct

Mark 2.00 out of 2.00

Every Boolean function can be constructed from **only**:

Select one:

- a. And function
- b. Or function
- c. Nand function ✔
- d. Not Function

Question **5**

Correct

Mark 2.00 out of 2.00

The statement foo[bar]=15 is conceptually the same as:

Select one:

- a. @bar, followed by foo=15
- b. @foo, followed by bar=15
- c. foo[*(bar)]=15
- d. *(foo+bar)=15 ✔
- e. All answers are wrong

Question **6**

Correct

Mark 1.00 out of 1.00

The basic idea of the stored program concept is that the logic of the programs is embedded in the hardware.

Select one:

- True
- False ✔

Question **7**

Correct

Mark 1.00 out of 1.00

Which part of the C-Instruction instructs the ALU what to compute?

Answer:

comp ✔

Question **8**

Correct

Mark 1.00 out of 1.00

The von Neumann architecture is based on a:

central processing unit (...), CPU ✔

interacting with a ... device, memory ✔

receiving data from some ... device, input ✔

and sending data to some ... device. output ✔

Question **9**

Correct

Mark 1.00 out of 1.00

Variable, arrays, and objects are stored in the computer's ... Data Memory ✔

High level commands are translated into machine language and stored in the computer's ... Instruction Memory ✔

Question **10**

Correct

Mark 2.00 out of 2.00

In the Hack machine language, the ability to use a command like @label before the label was actually declared in the program is thanks to the

Select one:

- a. fact that the order of HDL statements is insignificant.
- b. two-pass assembly process. ✔
- c. subsequent VM translation process.
- d. multi-purpose use of the A register.
- e. fact that the program counter feeds directly from the A register.

Question **11**

Incorrect

Mark 0.00 out of 1.00

What is the binary pattern that represents 7_{ten} (in a 16-bit binary system)?

Answer:

0000000000000110

✖

Question **12**

Correct

Mark 2.00 out of 2.00

In Hack Assembly the meaning of the symbols are their RAM and ROM addresses.

Select one:

- True ✔
- False

Question **13**

Correct

Mark 1.00 out of 1.00

16-bit / 64-register memory

16 is the _____ of the register data width ✔

64 is the _____ of the register size (number of words) ✔

Question **14**

Correct

Mark 1.00 out of 1.00

In an 8-way multiplexor the selection is specified by a set of ___ control bits.

Answer: 3 ✔

Question **15**

Correct

Mark 2.00 out of 2.00

As part of the translation process the symbols must be resolved into actual ...

Answer:

addresses

✔

Question **16**

Correct

Mark 2.00 out of 2.00

Match the following gates to their description.

And	If a=b=1 then out=1 else out=0 ✔
Not	If in=0 then out=1 else out=0 ✔
Nand	If a=b=1 then out=0 else out=1 ✔
Or	If a=b=0 then out=0 else out=1 ✔

Match the following gates to their description.

Question **17**

Correct

Mark 1.00 out of 1.00

True/False: The clock in a sequential logic circuit keeps track of hours, minutes, and seconds in the local timezone.

Select one:

- True
- False ✔

Question **18**

Correct

Mark 2.00 out of 2.00

Name an **unary** Boolean function:

Answer:

Not ✔

Question **19**

Correct

Mark 1.00 out of 1.00

What is the binary pattern that represents 6_{ten} (in a 16-bit binary system)?

Answer:

0000000000000110

✔

Question **20**

Correct

Mark 2.00 out of 2.00

Match each command (written in typical machine language syntax) to the memory access mode.

LOADI R1,67	Immediate addressing ✔
ADD R1,foo,j ; LOAD* R2,R1 ; STORE R2,x	Indirect addressing ✔
LOAD R1,67	Direct addressing ✔

Question **21**

Correct

Mark 1.00 out of 1.00

Match each commandType to its format:

A_COMMAND	@Xxx ✔
C_COMMAND	dest=comp;jump ✔
L_COMMAND	(Xxx) ✔

Question **22**

Correct

Mark 1.00 out of 1.00

The Screen and Keyboard chips should be part of the ... chip.

Answer:

Memory

✔

Question **23**

Correct

Mark 2.00 out of 2.00

During the second pass of the assembly process, if a symbol is not found in the symbol table, then it clearly represents a new ...

Answer:

variable

✔

Question **24**

Correct

Mark 1.00 out of 1.00

DFF behavior can be represented as:

Select one:

- a. out(t) = int(t-1) ✔
- b. in(t) = out(t+1)
- c. out(t) = out(t+1)
- d. out(t) = out(t-1)

Question **25**

Correct

Mark 2.00 out of 2.00

A-instruction is used for:

Select one:

a. Entering a constant.
b. Selecting a data memory location.
c. Selecting an instruction memory location.
d. All of these answers are correct. ✔

Question **26**

Correct

Mark 2.00 out of 2.00

Which Two-Input Boolean function will return 0 for every input it receives?

Select one:

a. Constant 0 ✔
b. Not
c. Nor
d. And

Question **27**

Correct

Mark 1.00 out of 1.00

In the DFF symbolic notation, the small triangle represents the :

Answer:

Clock

✔

Question **28**

Correct

Mark 1.00 out of 1.00

During the first pass of the assembly process you should use a counter.
This counter should be incremented by 1 whenever a C-command,
an A-command or an L-command is encountered.

Select one:

- True
- False ✔

Question **29**

Correct

Mark 1.00 out of 1.00

Which part of the CPU is in charge of decoding the instructions before they can be executed, and deciding which instruction to fetch and execute next?

Answer:

Control Unit ✔

Question **30**

Correct

Mark 1.00 out of 1.00

The program that translates from assembly to binary is called:

Answer:

Assembler ✔

Question **31**

Correct

Mark 2.00 out of 2.00

The Full Adder chip has:

Select one:

- a. 2 input pins, 2 output pins.
- b. 2 input pins, 1 output pin.
- c. 3 input pins, 2 output pins. ✔
- d. 3 input pins, 1 output pin.

Question **32**

Correct

Mark 2.00 out of 2.00

What is the mnemonic for an instruction that causes an unconditional branch to a new instruction?

Answer:

jmp

✔

Question **33**

Correct

Mark 2.00 out of 2.00

Any symbol Xxx appearing in an assembly program that is not predefined and is not defined elsewhere using the (Xxx) command is treated as a ...

Answer:

variable

✔

Question **34**

Incorrect

Mark 0.00 out of 2.00

Supply the hexadecimal result of 6 + 7 (both base 10) if stored in a 16 bit register.

Answer:

0000000000001101

✖

Question **35**

Correct

Mark 1.00 out of 1.00

In a 16-bit Multiplexor the selector is 16-bit wide.

Select one:

- True
- False ✔

Question **36**

Correct

Mark 2.00 out of 2.00

What is the **decimal** value of this 16-bit 2's complement number?

1111111111111100_{two}

Answer:

-4

✔

Question **37**

Correct

Mark 2.00 out of 2.00

When implementing the a 1-bit register, we need to tell the register when to store a new data and when to keep storing its internal value. For that we need a :
(Choose all correct answers)

Answer:

Multiplexor ✔

Question **38**

Correct

Mark 2.00 out of 2.00

The `addEntry` routine is being called only during the first pass of the Assembler.

Select one:

- True
- False ✔

Question **39**

Correct

Mark 1.00 out of 1.00

If a **demultiplexor** selector bit is set to 1 , and both outputs (a and b) are 0 , then the input must have been:

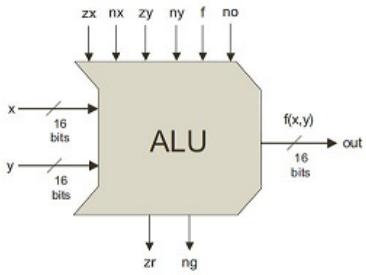
Answer: 0 ✔

Question **40**

Correct

Mark 2.00 out of 2.00

The **ny** control bit will:



Select one:

- a. Zero the y input.
- b. Negate the x input.
- c. Negate the ng output.
- d. Negate the y input. ✔

Question **41**

Correct

Mark 1.00 out of 1.00

People who use the chip as an internal part in other chip definitions should not be interested in the body of the chip definition.

Select one:

- True ✔
- False

Question **42**

Correct

Mark 1.00 out of 1.00

Different types of Registers:

Serves as short term memory.	Data Registers ✔
Used for storing memory location.	Addressing Registers ✔
Keeps the address of the next instruction that must be fetched.	PC Register ✔

Question **43**

Correct

Mark 2.00 out of 2.00

A **RAM** device accepts the minimum following inputs:

Select one:

- a. data input, and a load bit
- b. data input, an address input, and a load bit ✔
- c. data input, and an address input
- d. data input, and a clock input

Question **44**

Correct

Mark 1.00 out of 1.00

There are three types of symbols in the Hack language:

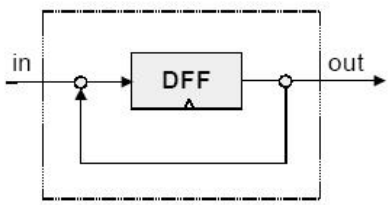
Predefined symbols	special memory locations	✔
Labels	destinations of goto commands	✔
Variables	variable names	✔

Question **45**

Correct

Mark 1.00 out of 1.00

Given the HDL language described in Appendix A, is the following design valid?



Select one:

- True
- False ✔

Question **46**

Correct

Mark 2.00 out of 2.00

What is the most basic element of every computer system?

Select one:

- a. CPU
- b. Memory
- c. Logic Gate ✔
- d. ALU

Question **47**

Partially correct

Mark 0.50 out of 1.00

In the assembly process of a two-pass assembler:

during the first pass	the assembler construct a symbol table.	✔
during the second pass	the assembler initialize the symbol table with all the predefined symbols.	✖

◄ Learning Guide Unit 9

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Final Exam ►