KafrelSheikh University
Faculty of Engineering
Electrical Engineering Department
Final Exam, 2019 -2020
Microprocessor and Application.

3th Year (Electronic and communication Engineering)
Date: 5 / 1 / 2020, 2 pages
Time: 3 Hours., Mark: 90
Academic Number:ECS3139
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Answer all the following questions:

This exam measures ILOs no: a3, a4, a8, a13, a14, b4, b5, b6, b13, c3, c6, c14, d1, d4

Question #1: Answer briefly on the following questions [36 marks]

1. What in general terms, is the distinction between computer structure and computer function?
2. What is the advantages and disadvantages of Harvard architecture?
3. Discuss the types of direction of data flow in serial communication.
4. Discus the different between direct and indirect addressing modes? Use drawing whenever you can.
5. Compare between SRAM & DRAM.
6. Discuss with drawing the components of the control unit of a basic computer.

Question #2- Choose the correct answer: [10 Marks]

1- In a normal n-bit adder, to find out if an overflow as occurred we make use of

A. AND gate. B. NAND gate.
C. NOR gate. D. XOR gate.

2- Both the arithmetic logic unit (ALU) and control section of CPU employ special purpose storage locations called _____.

A. Decoders. B. Buffers.
C. Demultiplexer. D. Registers

3- The register that keeps track of the instructions in the program stored in memory is _____.

A. Control register. B. Program counter.
C. Status register. D. Direct register.

4- When an instruction is read from the memory, it is called

A. Memory Read cycle. B. Fetch cycle.
C. Instruction cycle. D. Memory write cycle.

5- The periods of time when the unit is idle is called as _____

A. Stalls B. Bubbles
C. Hazards D. Both Stalls and Bubbles

6- The memory unit that communicates directly with the CPU is called the

A. main memory B. Secondary memory
C. shared memory D. auxiliary memory.

7- The Von Neumann System uses

A. Same memory for data and storage B. Different memory for program and data

C. Separate code memory, data memory, and Stack Memory D. None of these

8- During the execution of a program which gets initialized first?

A. MDR B. IR C. PC D. MAR

9- When we perform subtraction on -7 and -5 the answer in 2's compliment form is

A. 11110 B. 1110 C. 1010 D. 0010

10- Any computer must at least consist of

Data bus B. Address Bus C. Control Bus D. All of the above

Question #3- Answer by explanations the following questions [44 Marks]

1- Use the Booth algorithm to multiply 23 (multiplicand) by 19 (Multiplier), where each number is represented using 6 bits. [8 Marks]

2- What is the value of **10000000001100000000000000000000**, if it represents float number in IEEE 754 single precision format? [8 Marks]

3- If X = 0100 0001 1101 0000 0000 0000 0000 0000, (IEEE 754)
Y = 0100 0010 1111 0000 0000 0000 0000 0000, (IEEE 754)
Perform X + Y (showing all steps in Binary) [10 Marks]

4- Design a **3-bit binary** ALU operations due to the following truth table of the control signals. [10 Marks]

S_1	S_0	Operation
0	**0**	A AND B
0	**1**	A OR B
1	**0**	A XOR B
1	**1**	NOT A

5- MIPS is a 5-stage pipelined implementation of MIPS without forwarding. Consider the following piece of code containing data hazards.
Rewrite this code so that it does the same thing on MIPS, how many cycles before and after the reordering? [8 Marks]

```
lw $1,0($0)
add $2,$2,$1
lw $3,4($0)
add $4,$4,$3
```

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