Kafrelsheikh University
Faculty of Engineering
Electrical Engineering Department
Final Exam, 2018 -2019
Subject : Microprocessor and Application.

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Full Mark: 90, 2 pages

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 [20 Marks]

1. List and briefly define the main structural components of a computer.
2. What is the difference between RISC and CISC? Give example for each one, draw the architecture for each one.
3. Distinguish Von-Neumann Architecture with a simple drawing.
4. What is the advantages and disadvantages of serial communication?
5. What do you know about the frame in serial communication?

Question #2: Choose the correct answer: [20 Marks]

1- Registers contain data and instructions needed by the CPU.
a. True b. False

2- The fetch-decode-execute cycle refers to the process by which data is read from the hard drive and stored in memory.
a. True b. False

3- The memory unit that communicates directly with the CPU is called the .....
a. main memory b. secondary memory c. shared memory d. auxiliary memory.

4- The Von Neumann System uses _____.
a. Same memory for data and storage
b. Separate code memory, data memory, and Stack Memory
c. Different memory for program and data
d. None of these

5- Floating Point representation consists of _____.
a. Mantissa b. Exponent c. Both A and B. d. Neither A and B.

6- IEEE double precision of floating point representation has ..... Bits
a. 32 b. 64 c. 128. d. None of above

7- Each stage in pipelining should be completed within ____ cycle.
a. 1 b. 2 c. 3. d. 4

8- The 'heart' of the processor which performs many different operations _____
a. Memory b. Motherboard c. Control Unit. d. Arithmetic and logic unit

9- Unit of computer which is capable of performing arithmetic, logical and data manipulation operations on binary numbers is called
a. CU b. ALU c. I/O unit d. processing unit

10- The 2's complement of 15 is _____
a. 0000 b. 0001 c. 0010. d. 0100

Question #3: Answer by explanations the following questions:

1- Show the IEEE 754 binary representation for: (-75.4) in Single Precision. [5 marks]
2- If x = 1100 0110 1101 1000 0000 0000 0000 0000 (binary) and

y = 0011 1110 1110 0000 0000 0000 0000 0000 (binary)

Are single-precision floating-point numbers. Perform the following operations showing all work: a) x + y b) x * y [8 marks]

3- Multiply 4-bit 2's complement integers, 0110 × 1100, using the Booth algorithm multiplication of 2's complement integers. Show the steps of computation. [6 marks]

4- Carry out the calculation steps for 4-bit binary division of positive numbers 1000/0101 (i.e., 8/5) using the restoring division algorithm. [6 marks]

Question #4: Discuss with illustration by drawing [15 marks]

1- What is the advantages and disadvantages of Harvard architecture?

2- The components the Control unit of a basic computer.

Question #5: Pipeline [10 marks]

Consider the following sequence of instructions being processed on the pipelined 5-stage RISC processor

Add R4, R2, R3
Store R5, #100(R4)
Load R6, #200(R4)
Subtract R7, R5, R6

Identify all the data dependencies in the above instruction sequence. For each dependency, indicate the two instructions and the register that causes the dependency.

********** With Best Wishes **********

Dr. Wessam Fikry, Committee of Correctors and Testers