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Continuous Assessment Test I – September 2022

Programme	: B.Tech. CSE	Semester	: FALL 2022-23
Course	: Computer Architecture and Organization	Code	: BCSE205L
		Slot	: B2
Faculty	: Dr.Rama Prabha , Dr. Aswiga, Prof.Nivedita, Dr. Bhanu Chander Balusa, Dr.Anushiya Rachel, Dr. Sambasivarao, Dr A.K. Ilavarasi	Class Nbr	: CH2022231001507 CH2022231001510 CH2022231001511 CH2022231001512 CH2022231001513 CH2022231001514 CH2022231001515
Time	: 1½ Hours	Max. Marks	: 50

Answer ALL the questions

Q.No.	Questions	Marks
1.	i) Suppose you are an architect at Zion Computers and you are assigned the task of designing a processor that stores both data and instructions in the same memory and always accesses a pair of instructions at a time. Identify the suitable architecture for the given scenario and explain its structure with a neat diagram. (5 Marks)	10

ii) Explain how the following assembly language program would be stored in the memory and executed by the processor. (5 Marks)

    1001 Load A, LOC1

    1002 Add A, LOC2

    1003 JNC 1005

    1004 Sub A, LOC3

    1005 Store LOC4, A

    1006 HLT

| 2. | Assume that you want to multiply two numbers, which are stored in the memory locations 2:2 and 3:3 as shown in the following figure. | 10 |

Memory	1	2	3
1			
2		2	
3			3

Two possible set of instructions to carry out the above process are as follows:

A) Instruction set

Mul 2:2, 3:3

B) Instruction Set

Load A, 2:2
Load B, 3:3
Mul A,B
Store 3:2, A

Identify the processor corresponding to the instruction set A and B and elaborate on the same. Also discuss the merits and demerits of these processors.

3. Multiply $(-7)_{10} \times (8)_{10}$ using modified Booth's Algorithm.

    i.   State how the modified booth is more efficient when dealing with operands of large value.   **4**
            Comment whether the multiplier yields best case/worst case /ordinary case outcome.

    ii.   Determine the final product of multiplicand and bit-pair recoded multiplier in binary format.

            6

4. A coin-change dispensing machine provides an appropriate number of Rs.5 coins in exchange for **10** a note inserted into it. If the machine makes use of non-restoring division algorithm to calculate the number of coins dispensed, illustrate the steps involved in calculating the number of Rs.5 coins to be dispensed in exchange for a Rs.20 note.

5. Perform the following Floating point operation on the numbers $(251.529)_{10}$ and $(142.758)_{10}$.

    i.   Convert the above decimal numbers to normalized notation of binary format.   **4**

    ii.   Perform subtraction for the given numbers and write the normalized result in IEEE **6** single precision format.

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