**BPDC, Dubai - First Semester, 2020-2021**

**DEPARTMENT OF CS**

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| **Course No: CS F342**  **Date: Week #09**  **Id No:** | **TUTORIAL 9** | **Course Title: Computer Architecture**  **Name:** |

1. Perform addition of the following decimal nos in binary: A =.75, B = 6.25. Assume 5 bits of precision. Express the result in decimal. Show all your steps clearly.

Step1: Convert the numbers in binary and express in normlized form

A = 0.75 = .11 = 1.1000\*2^-1

B = 6.25 = 110.01 = 1.1001 \* 2^2

Step2: The significand of the number with the lesser exponent is shifted right until its exponent matches the larger number

A = 0.0011\*2^2

B = 1.1001\*2^2

Step3: Add the significands:

Ans = 1.1100\*2^2

Step4: Normalize the sum, checking for overflow or underflow:

Sum is normalized

Ans = 1.1100\*2^2

Step5: Round the sum

The sum already fits exactly in 5 bits, so there is no change to the bits due to rounding.

Ans = 1.1100\*2^2

Converting to decimal

(1+0.5+0.25)\*4 = 7

1. Given the instruction lw $1, 100($2), show the data path required for execution of this instruction only (along with names of inputs/outputs).



1. add $t1, $t2, $t3
2. lw $t5, 8($t4)

What are the values of the following control signals for the two instructions?

*RegWrite, MemRead, ALUsrc, MemWrite, Branch.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | RegWrite | MemRead | ALUsrc | MemWrite | Branch |
| 1 | 1 | 0 | 0 | 0 | 0 |
| 2 | 1 | 1 | 1 | 0 | 0 |