

The objective of this homework is to test your understanding of the content of Module 6. Due date of the homework is: **Friday, October 30th, 2020**. You have to upload a scanned version of your solutions on Blackboard. If you don't have a scanner around you, you can use Cam Scanner—a mobile app that scans images in a neat way, as if they're scanned through a copier.

For questions related to the homework, please email the two teaching assistants: (a) Wasim (email: wasim.dipon@my.utsa.edu) and (b) Yuvaraj (email: yuvaraj.munian@my.utsa.edu).

You can send your question to both of them on the same email. Feel free to CC me as well, but that is not necessary.

1. Convert the Following, (Decimal Number conversions)(15 Marks)

- a. $123.456_{10} = ()_2$
- b. $1110.1101_2 = ()_8$
- c. $11101.10101_2 = ()_{16}$

2. Convert the following base 10 numbers into 8-bit 2's complement notation 0, -1, -12. (15 Marks)

3. Convert the Following, (Decimal Number conversions) (15 Marks)

- a. $(4231)_8 = ()_{16}$
- b. $(6879)_{16} = ()_8$

4. Perform the following binary subtraction using 6-bit 2's complement addition. [Hint: $A-B = A + (-B)$] (20 Marks)

- a. $15 - 18$
- b. $27 - 6$

5. Solve the following problems using binary addition of 4-bit unsigned and signed 2's complement representation. (20 Marks)
- a. Unsigned binary addition: $(11)_{10} + (8)_{10}$
 - b. Signed 2's complement addition: $(-3)_{10} + (-7)_{10}$
6. Write down the signed and unsigned range of possible values for 4 bit, 6 bit and 8 bit 2's complement representation.[Hint: For signed: -2^{N-1} to $2^{N-1} - 1$]. (15 Marks)