MATH18584 Fundamentals of Computer Mathematics

**Assignment 1**

**Instructions:**

* This assignment will be graded out of 40
* This assignment is to be completed individually. Assignments copied in whole or in part will receive a grade of ZER0.
* You must show your work for full marks!
* Due Date: As per SLATE calendar.
* Answers may only be submitted in the following formats:
  + Microsoft Word Document (.docx)
  + Adobe PDF Document (.pdf)
  + Do not submit external links. Scanned documents need to be legible and in pdf format.

1. Evaluate the following **singed binary** numbers and give the decimal values. If the answer is a negative number, state the absolute value of it. (2 marks each)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a) | 1 1 0 0 0 1 0 0 + 1 0 1 1 0 0 | b) | 0 1 1 1 0 1 1 0 - \_\_0 1 1 1 1 0 1 | c) | 1 1 0 1 1 1 0 0 - 1 0 1 0 1 1 1 0 |

1. Solve. (2 marks each)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| a) |  | b) | |  |  |  |
|  |  |  |  | |  |

1. Convert the following decimal numbers. Show all your steps. (2 marks each)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a) | 189dec to binary | b) | 4112dec to Hex |  |  |

1. Convert the following: (2 mark each)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a) | 50FE3hex to binary | b) | 0111000111111000101101bin to hexadecimal |  |  |

1. Find the binary equivalent for each of the following base 10 numbers. Give your answers with four (4) places after the point ( 2 marks each)
   1. 32.4510
   2. 28.55510
   3. 7.020210
   4. 13.687510

1. Use 2’s complement to perform binary arithmetic operation of the following decimal numbers. If the answers are negative explain ( 2 marks each)
   1. -11110 -12710
   2. 12310 - 6110
   3. -8310 +1810

1. Natasha would like to buy a boat that costs **A2BD6**hex dollars. She has $59460010 in the bank and her brother will give her the remainder in **binary currency**. How much will he offer her? (2 marks)

1. Find the truth value of each of the expressions below, using the truth values shown. Show all your steps. (2 marks)
2. Using the Identities and Laws of Boolean Algebra, simplify the following expressions. List the specific law used for every simplification. (2 marks each)