Assignment 5

Due: 9:00am, Thu Feb 22nd, 2018

Note: Make reasonable assumptions where necessary and clearly state them. Feel free to discuss problems with classmates, but the only written material that you may consult while writing your solutions are the textbook and lecture slides/videos. Solutions should be uploaded as a single pdf file on Canvas. **Show your solution steps** so you receive partial credit for incorrect answers and we know you have understood the material. Don't just show us the final answer.

1. Convert the decimal number -26.3125 into the IEEE 754 format for a single-precision floating-point number. (20 points)
2. Convert the following IEEE 754 single-precision floating-point register into a decimal number: 1 10000111 11010000000000000000000. (20 points)
3. Convert the following IEEE 754 double-precision floating-point register into a decimal number: 1 10000000011 1010000000000000000000000000000000000000000000000000. (20 points)
4. What is the result of adding the following two IEEE 754 single-precision floating-point registers? Show your steps as you perform the math in binary and produce the final IEEE 754 value that will be placed in the register. (20 points)
   0 10000010 00100000000000000000000
   0 10000101 11000000000000000000000
5. Compute the truth table for a logic block that takes in a 3-bit input and produces a 2-bit output that represents the number of 1's in the 3-bit input. For example, if the input is 101, the output should be 10, i.e., there are two 1's in the input 101. Express each output bit with a sum-of-product Boolean equation. (20 points)