

HOME ASSIGNMENT
Subject- Computer Organization and architecture
(Based on lecture 8 and 9)

1.
 - a) Convert from IEEE 754 to decimal: 0xC0900000
 - b) What is the smallest positive integer that is a power of 2 that can be represented in IEEE 754 but not as a signed int? You may leave your answer as a power of 2.
 - c) What is the smallest positive integer x such that $x + 0.25$ can't be represented? You may leave your answer as a power of 2.
 - d) If we decide to stray away from IEEE 754 format by making our Exponent field 10 bits wide and our Mantissa field 21 bits wide. This gives us more or less precision? Justify.
2.
 - a) In IEEE 754 floating point, how many numbers can we represent in the interval $[10,16)$? You may leave your answer in powers of 2.
 - b) If we use 7 Exponent bits, a denorm exponent of -62, and 24 Mantissa bits in floating point, what is the largest positive power of 2 that we can multiply with 1 to get underflow?
3.
 - a) Multiply 14 times -5 using 5-bit numbers (10-bit result).
 - b) Divide 23 by 5 using restoring division algorithm.
4. Choose the correct one with proper justification
 - (I) Inputs of ALU unit are
 - a. Control Unit and Registers
 - b. Flags and Registers
 - c. Control Unit and Flags
 - d. None
 - (II) Which is the sign bit in the word
 - a. Least Significant Bit (LSB)
 - b. Most Significant Bit (MSB)
 - c. Both a & b
 - d. None of the above
 - (III) The representation of -18 in sign and twos complement (more than one correct) is
 - a. 00110010
 - b. 00010010
 - c. 10010010
 - d. 11101110State which option is sign representation and which is two's complement.
 - (IV) The correct alternative methods of rounding the result of a floating point operation (more than one may be correct).
 - a. Round to nearest
 - b. Round toward $+\infty$
 - c. Round toward $-\infty$
 - d. Round toward 0