Cpr E 281 RC06
WEEK 8
ELECTRICAL AND COMPUTER ENGINEERING
IOWA STATE UNIVERSITY

Recitation Material for Week 8
Tasks to do in the recitation section
Assigned Date: Seventh Week

T1. Review HW06 problems and solve any problems that students point out they had difficulty with.

T2. Answer any general questions about HW07 and Lab 06.

T3. Solve the following problems.

1. Suppose you want to uniquely represent 24 objects using a binary number. What is the minimum number of bits that you need? What if you have n objects?
2. Perform the following conversions:
   a. $(1010101)_2$ to decimal
   b. $(139)_{10}$ to binary
   c. $(0101101110)_2$ to hexadecimal
   d. $(ABC)_{16}$ to binary
   e. $(FE45)_{16}$ to octal
   f. $(1234)_5$ to base 6 representation
   g. -25 in decimal to 6-bit sign-and-magnitude
   h. -25 in decimal to 6-bit 1's complement
   i. -25 in decimal to 6-bit 2's complement
   j. $(10110)_2$ in 5-bit sign-and-magnitude to 5-bit 1's complement
   k. $(10110)_2$ in 5-bit sign-and-magnitude to 5-bit 2's complement
   l. $(11101)_2$ in 5-bit 1's complement to 5-bit sign-and-magnitude
   m. $(11101)_2$ in 5-bit 1's complement to 5-bit 2's complement
   n. $(101110)_2$ in 6-bit 2's complement to 6-bit sign-and-magnitude
   o. $(101110)_2$ in 6-bit 2's complement to 6-bit 1's complement
3. Negate the following 6-bit 2's complement binary numbers:
   a. 001010
   b. 110011
4. What should the base b be such that x=3 is a root of the equation $6_b\, x^2 - 55_b\, x + 105_b = 0$?
5. Represent the decimal number 13.1875 in IEEE 754 single-precision floating-point format.
6. Convert the following IEEE 754 single-precision floating-point number to decimal.
   1 10000011 01100000000000000000000
7. Convert the following IEEE 754 single-precision floating-point number to decimal.
   10111101 01010000 00000000 00000000
8. Convert $BEC00000_{16}$ (a 32-bit floating-point number in IEEE 754 format) to decimal.