Name: KEY **Id#**

COE 202, Term 142
Digital Logic Design

Quiz# 1

Date: Tuesday, Feb. 10, 2015

Q1. Assume that we would like to transmit four different values v1, v2, v3 and v4 using a voltage range from **0 to 12 volts**. Determine the voltage values that will be used to represent these values with **maximum noise tolerance**. Determine the maximum noise tolerance achieved.

Step = 12/3 = 4v, Maximum noise tolerance = 4/2=2v

The values chosen are as follows:

v1=0v, v2=4v, v3=8b, v4=12v

Q2. Determine the **decimal** value of the following numbers:

i. $(11110001.101)_2$

$= (241.625)_{10}$

ii. $(3E.E)_{16}$

$= (62.875)_{10}$

Q3. Represent the following numbers in **binary**. Use as many bits as needed, and approximate the fraction to **4 <u>binary</u> digits**:

i. $(416.4)_{10}$

$= (110100000.0110)_2$

ii. $(C2.3)_{16}$

$= (1100\ 0010.0011)_2$

Q4. Perform the following arithmetic operations:

i. **$(01101111)_2 + (00111001)_2$**

$= (10101000)_2$

ii. **$(EA)_{16} - (AF)_{16}$**

$= (3B)_{16}$

iii. **$(4A)_{16} * (32)_{16}$**

$= (E74)_{16}$

Q5. Fill in the Spaces: (Show all work needed to obtain your answer)

a. The largest decimal value that can be expressed using 8 binary integer digits and 4 binary fractional digits is $2^8-2^{-4}=255.9375$.

b. The number **128** is represented in **BCD** as 0001 0010 1000.

c. Given that an 8-bit register stores the ASCII code of a character in the least significant 7 bits and a parity bit in the most significant bit. Assuming that the register contains the hexadecimal value **E3** representing a character, the character stored in the register is 'c' and the parity used is odd (i.e. even or odd parity). Note that the ASCII code of character 'A' is 41h and the ASCII code of character 'a' is 61h.