Name: KEY Id#

COE 202, Term 141

Digital Logic Design

Quiz# 1

Date: Tuesday, Sep. 16

# 

# **Q1.** Assume that an analogue signal has a range of **0 to 10 volts**. Suppose that we need to quantize the analogue signal into a digital signal using only **4** different values. Determine these values and the maximum quantization error.

Step = 10/4=5/2; Maximum quantization error = 5/4

Values: 5/4, 15/4, 25/4, 35/4

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

## (11110011.111)2

= 243.875

## (4A.C)16

# 

= 74.75

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

## (250.6)10

## = (11111010.1001)2

## (EF.2)16

## = (1110 1111.0010)2

# **Q4.** Perform the following arithmetic operations:

## (01101111)2 + (00100111)2

## = (10010110)2

## (8A)16 - (2B)16

= (5F)16

## (2F)16 \* (15)16

= (3DB)16

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

1. The largest decimal value that can be expressed using 4 binary integer digits and 4 binary fractional digits is =24-2-4=15.9375.
2. The number **59** is represented in **BCD** as 0101 1001.
3. 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 **C5** representing a character, the character stored in the register is E and the parity used is even 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.