Name: KEY Id#

COE 202, Term 151

Digital Logic Design

Quiz# 1

Date: Sunday, Sep. 6, 2015

# 

# **Q1.** Determine the **decimal** value of the following numbers:

## (11011100.011)2

Integer part = (25 – 22) + (28 – 26) = 32-4+256-64=288-68=220

OR: 255-32-3 = 255-35 = 220

Fraction part = 1/4 + 1/8 = 0.25 + 0.125 = 0.375

Thus, the number is equal to 220.375.

## (2A.C)16

# 

= 2\*16 +10 + 12/16 = 42.75

# **Q2.** Represent the following numbers in **binary**. Use as many bits as needed, and use only **4 binary** digits to represent the fraction:

## (499.7)10

Integer part= 511 – 12 = 111110011

Fraction part: 0.7 \*16 = 11.2 => First hex fraction digit is B => (0.B)16 = (0.1011)2

Thus, the number in binary is (111110011.1011)2

## (E3.5)16

= (11100011.0101)2

# **Q3.** Perform the following arithmetic operations in the given bases:

## (01110111)2 + (01011011)2

= (11010010)2

## (A2)16 - (8E)16

= (14)16

## (5E)16 \* (32)16

= (125C)16

Q4. Fill in the Spaces: (Show all work needed to obtain your answer)

1. Given that the base R number (222)R is equal to (62)10. Then the base R = 5.

2R2 + 2R + 2 = 62 => R2 + R + 1 = 31 => R2 + R - 30 = 0 => (R+6)(R-5)=0

* R=-6 or R=5

1. The largest unsigned decimal value that can be expressed using 6 binary integer digits and 2 binary fractional digits is 26-2-2=63.75.
2. The number **53** is represented in **BCD** as 0101 0011.
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 **C4** representing a character, the character stored in the register is 'D' 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.