**BRAC University (Department of Computer Science and Engineering)**
**CSE 330 (Numerical Methods) for Spring 2024 Semester**

**Quiz 1 [CO1]**
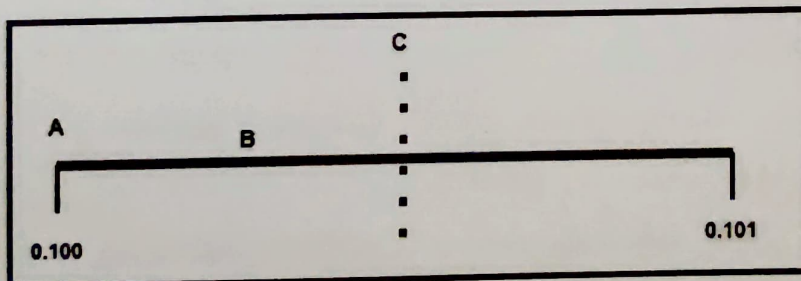
Student ID:

Name:

Section: 08

Full Marks: 10
Duration:15 minutes

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1. The lowest value is **equal** to the highest negative value for any system.

   ✓ a) True
   b) False

2. A point will be mapped to the closest **ODD** floating point, if it is **exactly at the midpoint**:

   a) True
   ✓ b) False



Here C is the midpoint. Answer qs 3 and 4 using the above diagram

3. The Error is **minimum** if my value, x is at:

   ✓ a) A
   b) B
   c) C

4. The value x at B, is mapped to:
   ✓ a) A
   b) B
   c) C

5. Let say we have $\beta=2$, m=3, using **Normalized convention**. Find the absolute rounding error of x = (1.11011).  [2]

$$(1.11011)_2 \rightarrow (1.84375)_{10}$$

when
m=3

$$\rightarrow (1.110)_2$$

$$(1.75)_{10} \quad (1.8125)_{10} \quad (1.875)_{10}$$

$$|1.875 - 1.84375|$$

$$= 0.03125$$

6. Let say we have $\beta=2$, m=4, $-3 \leq e \leq 3$ using the **DeNormalized convention** (convention 03) of the floating point representation, Find:  [4]
   (i)   Highest Positive Number
   (ii)  Lowest Positive Number
   (iii) Lowest Negative Number
   (iv)  Highest Negative Number

(i)  $\left(0.1\underbrace{1111}_{m=4}\right)_2 \times 2^3$

(ii) $\left(0.10000\right)_2 \times 2^{-3}$

(iii) $-\left(0.10000\right)_2 \times 2^{-3}$

(iv) $-\left(0.11111\right)_2 \times 2^3$