**BRAC University (Department of Computer Science and Engineering)**

**CSE 330 (Numerical Methods) for Summer 2024 Semester**

**Quiz 1 [CO1]**

**Student ID:**

**Full Marks: 10**

**Section:**

**Name:** **Duration: 20 minutes**

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1. If $\beta$=2, **fraction**=2 bit, **exponent**=3 bit, what will be the **non-negative smallest** and **largest** possible number that can be generated using the **normalized** form of the floating point representation?
Also find the smallest and largest number if **negative support** is allowed in the above question. (3 marks)

**Ans:**

2. If $\beta$=2, m=5, $-100 \leq e \leq 100$, what will be the **machine epsilon($\epsilon_M$)** number using the **denormalized form** of the floating point representation? (1 mark)

**Ans:**

3. If $\beta$=2, m=4, $-3 \leq e \leq 3$, how many floating point numbers can be generated using the **standard convention** of the floating point representation? (1 mark)

**Ans:**

4. If $\mathbf{y=\frac{5}{16}}$, then find **fl(y)** where **mantissa=2 bit, -3 ≤ e ≤ 3**.{Use general/standard convention} (2 marks)

**Ans:**

5. If **x=5/8** and **y=7/8**, find **fl(xy)** where **mantissa=4 bit**. Also check whether **xy=fl(xy)**.
If not, find the rounding error of the product of these two numbers. (3 marks)

**Ans:**