PURITAGE Year - BE

CSE 330

Numerical Methods

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Section: 11

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Ans oto othe ques no - 12 il amond
       Given that, or (3 1200)=
          Decommolised tour ! for a to- my x 2-4
              -4 < e < 2
        Maximum number in,
 20 Lecture Note Form : (0) | $ | 1 | 1) (1 x 2 2 mo)
           = (3.75), o
           Normalized form = (1.1111) x 22
 (c) 100) x 2-3 = 0 9375
                         = (7.75)_{12} \times (0.00)_{12}
(0-1101)2×2-3=0.1015625
            Denormalized form = (0'11111), x 2
(0-1 1 10)2x 2 = 0 109375
                       2518150(3.8.7.5)
1 (0.1111) × 2-3 = 0 1171875
                        2 FE 8 2 8 0 1 1 0 (1 A+5)
          Non negative ou minimum number in,
          Lecture Note form: (0.1000), x2-4
                             = (0.03 1, 2 5)
```

wolf nobau

Normalized form: (1:0000) x 2-4 = (0.0625), bod - asol Denormalized form: (0.10000) 2 x 2-4 = (0.03125)10 [For Eq.(1) (1 if i le=)-3, mithe mumbers will be in the form 7. (0:1 - -) 2 × 2-3 Findings combinations 1-1) = month best lament $(0.1000)^{5} \times 5^{-3} = 0.0652$ $(0.1100)^{5} \times 5^{-3} = 0.8342$ $(0.100)^{-3} = 0.040315$ $(0.1101)^{5} \times 5_{-3} = 0.101265$ $(0.1010)^{5} \times 5^{-3} = 0.048152$ $(0.1110)^{5} \times 5^{-3} = 0.1003342$ $(0.0101)^{2} \times 2^{-3} = 0.0859342 / (0.1111)^{5} \times 2^{-3} = 0.1141842$

under flow

over flow The number line will be equally spaced.

Because, the difference of every number

is -> (0.0001)2×2-3

Machine residon, Em = 1/2 (1.00001) 7x2- (1.0000) 2x5

Ans to the ques no:-2

Given that, $\beta = 2$ m = 5 -2 < 6 < 5

Monmalized: (1.00000) = 2-2

Sult consor boxilbrarion (b). 25) 10. not planslimit

Denoumalized : 1 (0.100,000) x 2 2

(10000) (A-3)

[b] For the Normalized form, a) lets take two values (Aljacent), which are (1.00000) x2e and . (1.0000 1), x2e.

: Machine epsidon, & m = 1 (1.00001) x2e (1.00000) x2e

1 (0.00001), × 2° = - z · z - 5 · z e

2 2 · 2

 $\frac{1}{2} \cdot 2^{1-5} \quad [[x]] = \beta^{-1}$

(o o 3125

15x (000001): Landonill similarly for the denormalized form, the

machine epsilon will be,
$$E_{m} = \frac{1}{2} \left[(0.10000 \, 1)^{2} \times 2^{e} - (0.100000)^{2} \times 2^{e} \right]$$

$$= \frac{1}{2} \times (0.000001)^{2} \times 2^{e}$$

$$= \frac{1}{2} \times 2^{-6} \times 2^{e}$$

$$= \frac{1}{2} \times 2^{e-6} \times 2^{e}$$

$$= 0.015625(18000.1)) 17 = (Ans)$$
(Ans)
(2 x(100.1)):

[] We know, |S| < Em

Now, Eq.(2) is the Normalized form of floating point presentation.

From b, the Em for othis system = 0'03125

Ans to the lowes who'- 3 milann Given That, (0000010) - 35x (1000010) = 33 m=3 -2≤e < < (1000000) ~ 1: 95 x 3-5 x 1-3-3 54 == FJ ((2.23),) (2'23)10 = FL ((10-00111)2) = ET ((1.000111) x 5,) = 2 9 3 10.0 = middle 1.0001 = (1.001) x 21 1 WE Know. | 51 < €m (2.5018)10 = (5) 00 00 (5,501 000) = ET ((10.001,1001)))d topod topod 1,000 == FX (2 (120001/20011) 2x2')] == FX (2 (120001/2) 2x2') = (1.001) 2 x 2 x (80.0 = 1;) middle

Roerox

For $(2.23)_{10}$, $(3.23)_{10}$,

= 0.0089686098610010 = 0.0089686098610010

 $= \frac{|2 \cdot 25 - 2 \cdot 2018|}{|2 \cdot 2018|}$ $= \frac{|2 \cdot 25 - 2 \cdot 2018|}{|2 \cdot 2018|}$

X D

$$FL((2.23),0)$$
= FL((0.0011101)²×2²)
= (0.1001)²×2²)
= (0.1001)²×2²)
= (0.1001)²×2²)
= (0.1001)²×2²)
= (0.1001)²×2²)

i. (2.23), or (10.0011101), is not exactly represented as in the system, but can be represented as (0.1001), x 2203 83 88 0000

$$FL((2.2018)^{10})$$
= $FL((2.2018)^{10})$

$$= FL((2.2018)^{10})$$

$$= FL((2.2018)^{10})$$

$$= FL((2.2018)^{10})$$

$$= (0.1010)^{2} \times (2018)^{10}$$

(2.2018), on (flotoolloolli) is not exactly nepresentable in the system, but can be nepresented as (0.1010), × 22

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