

$(12.75)_{10} = (0110011000\ 000100)_2$

$\Rightarrow \curvearrowleft 100.11$

$\Rightarrow \begin{matrix} 0.110011 & \times 2^4 \\ \downarrow & \downarrow \downarrow \\ \times & \times \end{matrix}$

$\Rightarrow \begin{matrix} 0110011 & 0100 \\ \hline \text{Mantissa} & \text{Exponent} \end{matrix}$

10b M 6b Exp

0110011000 000100 Ans 7.

(FPN)

-9.25

$\begin{matrix} +9.25 \\ \curvearrowleft 1001.01 \\ 0.100101 \times 2^4 \\ 0100101\ 0100 \quad 10b\ M \\ +ve\ 0100101000\ 000100\ 6b\ E \\ -ve\ 1011010000\ 000100 \end{matrix}$

$\curvearrowleft +ve$

$0101010000\ 000011$

0.10101×2^3

101.01

$+5.25$

$\curvearrowleft -ve$

$1011010000\ 000100$

$0100110000\ 000100$

0.10011×2^4

1001.1

(-9.5)

$2^0\ 2^{-1}\ 2^{-2}\ 2^{-3}\ 2^{-4}\ 2^{-5}\ 2^{-6}\ 2^{-7}$

$-1\ .5\ .25\ .125\ .0625\ .03125\ .015625$

$-4\ 2\ 1$

$+3\ -4$

MANTISSA EXPONENT

- Fraction - Int.

- 2's - 2's

- fill left to right - fill right to left.

- Accuracy - Size/Range

- drop from right (underflow) - drop from left (overflow)

$\curvearrowleft -ve$

$11111011\ 01001$

$000000101\ 01001$

0.00000101×2^9

1010.00

-10.0

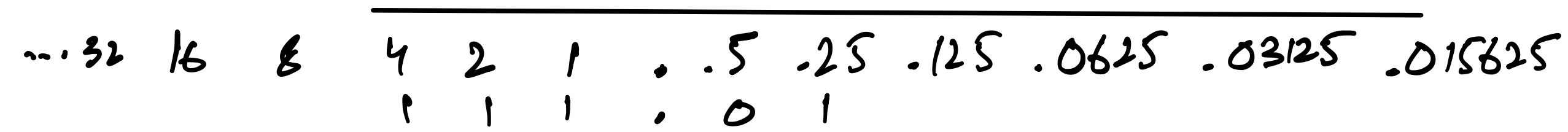
$11-4=7$

$0000010101\ 001011$

Non-Normalised

$01010100 \rightarrow 00111$

M E



$(7.25)_{10}$

$\Rightarrow \curvearrowleft 111.01$

$\Rightarrow \begin{matrix} 0.11101 & \times 2^3 \\ \downarrow & \downarrow \downarrow \\ \times & \times \end{matrix}$

$\Rightarrow \begin{matrix} 011101 & 011 & 8bits\ M \\ 011100 & 0001 & 5bits\ E \end{matrix}$

$\checkmark -11.0625$

11.0625

1011.0001

0.10110001×2^4

$010110001\ 0100$

$+ve\ 0101100010\ 000100$

$-ve\ 1010011110\ 000100$

Ans 7.

10bits M

6bits E

$+ve$

$0100110000\ 000100$

0.100111×2^4

1001.11

$+9.75$

$-ve$

$0110010000\ 000100$

$0100110000\ 000100$

0.100111×2^4

1001.11

-9.75

$0000010100\ 001001\ 9-4=5$

$0101000000\ 000101$

0.101×2^5

10100

$+20.0$

Normalised

$0000010100\ 001001$

0.0000010100×2^9

10100

$+20.0$

$1111101010\ 001000$

$1010100000\ 000100$

01011

0.1011×2^4

1011.0

$(-11.0)_{10}$

	Mantissa	Exponent
L+	L+ 0111	L+ 0111
S+	S+ 0100	S- 1000
L-	L- 1011	S- 1000
S-	S- 1000	L+ 0111

FP

Mantissa	Exponent
Accuracy	Size/Range

< >

* Roughly Normalised

Smallest Magnitude +ve Num.

L- S+ L+

-32 -16 -8 -4 -2 -1 0 +1 +2 +4 +8 +16 +32

Largest Magnitude -ve Num.

Smallest Magnitude -ve Num. Doesn't exist.

Largest Magnitude +ve Num.

4bits Mantissa

4bits Exponent

L+:
0111 0111
 0.111×2^7
1110000
+112.0

S+:
0100 1000
 0.1×2^{-8}
 0.000000001
 2^{-9}

L-:
1011 1000
0101 1000
 0.101×2^{-8}
 0.00000000101
 $-(2^{-9} + 2^{-11})$

S-:
1000 0111
 -1×2^7
 -2^7
 -128