FPN

CSCC37 Examples

1. Convert $(101110)_2$ to decimal.

Soln:

$1\times2^5+0\times2^4+1\times2^3+1\times2^2+1\times2^1+0\times2^0$
$=32+8+4+2$
$=(46)_{10}$

2. Convert $(46)_{10}$ to binary.

Soln:

Numerator	Denominator	Quotient	Remainder
46	2	23	0
23	2	11	1
11	2	5	1
5	2	2	1
2	2	1	0
1	2	0	1

Reading the remainder col from bottom to top, we get 101110.

3. Convert $(0.5)_{10}$ to binary.

Soln:

Multiplier	Base	Product	Integral	Fraction
0.5	2	1.0	1	0

Hence, $(0.5)_{10} = (0.1)_2$.

4. Convert $(0.75)_{10}$ to binary.

Soln:

Multiplier	Base	Product	Integral	Fraction
0.75	2	1.5	1.0	0.5
0.5	2	1.0	1.0	0

We read the integral col top to bottom.
Hence, $(0.75)_{10} = (0.11)_2$.

5. Convert $(5.875)_{10}$ to binary.

Soln:
We need to split 5.875 into 5 and 0.875 and convert each part individually and then combine the results.

Converting $(5)_{10}$ to binary:

Numerator	Denominator	Quotient	Remainder
5	2	2	1
2	2	1	0
1	2	0	1

Hence, $(5)_{10} = (101)_2$

Converting $(0.875)_{10}$ to binary:

Multiplier	Base	Product	Integral	Fraction
0.875	2	1.75	1	0.75
0.75	2	1.5	1	0.5
0.5	2	1.0	1	0

Hence, $(0.875)_{10} = (.111)_2$

Putting it all together, $(5.875)_{10} = (101.111)_2$.

6. Convert $(10.125)_{10}$ to binary.

Soln:

Converting $(10)_{10}$ to binary

Numerator	Denominator	Quotient	Remainder
10	2	5	0
5	2	2	1
2	2	1	0
1	2	0	1

Hence, $(10)_{10} = (1010)_2$.

Converting $(.125)_{10}$ to binary

Multiplier	Base	Product	Integral	Fraction
0.125	2	0.25	0	0.25
0.25	2	0.5	0	0.5
0.5	2	1.0	1	0

Hence, $(0.125)_{10} = (0.001)_2$

Putting it together, $(10.125)_{10} = (1010.001)_2$.