

DIGITAL LOGIC DESIGN

29-March-2023 (first class)

Topic = Number system

Number Systems

Binary (2)

Decimal (10)

Octal (8)

Hexa (16)

Decimal to Binary ∞ Bits

10

64 32 16 8 4 2 1
1 1 1 1 1 1 1

1010

110

128 64 32 16 8 4 2 1
1 1 1 1 1 1 1 1

01101110

Binary to Decimal ∞ Bits

→ 10101

$$16 + 4 + 1 = 21$$

→ 110111

$$32 + 16 + 4 + 2 + 1 = 55$$

Octal to Binary (only 3 Bits)

42

4 2 1
1 1 1

100 - 4

010 - 2

$(100010)_2$

62

4 2 1
1 1 1

110 - 6

010 - 2

$(110010)_2$

Binary to Octal

4 2 1 4 2 1 4 2 1
0 1 1 1 1 0 0 1

3

7

1

$= (371)_8$

4 2 1 4 2 1
0 1 0 1 1 1

2

7

$= (27)_8$

Hexa to Binary

(only 4 Bits)

0 1 2 3 4 5 6 7 8 9 A B C D E F
10 11 12 13 14 15

A23

8 4 2 1
1 1 1 1

1 0 1 0 — A

0 0 1 0 — 2

0 0 1 1 — 3

$(101000100011)_2$

Hexa to Octal

$(8A2)_{16} \Rightarrow ()_8$

8 4 2 1
1 1 1 1

0 0 1 0 — 2

1 0 1 0 — A

1 0 0 0 — 8

$(100010100010)_2$

4 2 1 4 2 1 4 2 1

$(4242)_8$

Exercise:

$(123)_8 \Rightarrow ()_{10}$

4 2 1
1 1 1

0 0 1 1

0 1 0 2

0 1 1 3

$(001010011)_2$
64 32 16 8 4 2 1

$64 + 16 + 2 + 1 = (83)_{10}$

Install,

Multisim

simulation accuracy

MATLAB

Maths Laboratory

emulation - neat & practical

ASSIGNMENT 01:-

1) $(Roll\ no.)_{16} \Rightarrow ()_8$

2) $(Roll\ no.\ last\ four)_{10} \Rightarrow ()_{16}$

3) $(AB834)_{16} \Rightarrow ()_2$

4) $(1011110111)_2 \Rightarrow ()_8$

5) $(93)_8 \Rightarrow ()_2$