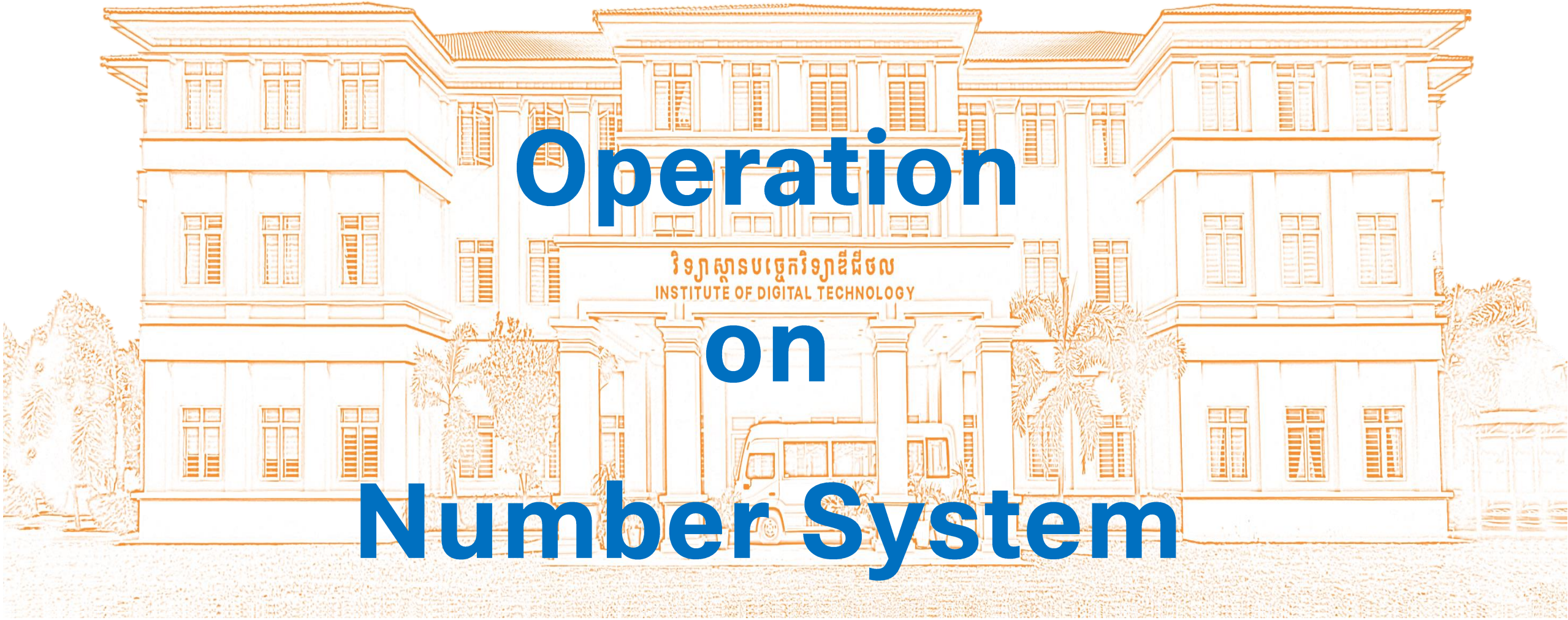
CADT
IDT វិទ្យាស្ថានបច្ចេកវិទ្យាឌីជីថល
Institute of Digital Technology

Department of Foundation Year



Operation on Number System

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Operation on number System

Operation on Binary

❖ Addition

+	0	1
0	0	1
1	1	10

0 + 0 = 0
0 + 1 = 1
1 + 0 = 1
1 + 1 = 0 , with carry of 1
1+1+1=1 , with carry of 1

Operation on number System

Example : Calculate $101101_2 + 10011_2$

Operation on number System

Example : Calculate $100011.1101_2 + 1011.011_2$

Operation on number System

Example : Calculate $55 + 35$ in binary

Operation on number System

❖ Subtraction in binary

0 – 0 = 0
1 – 0 = 1
1 – 1 = 0
0 – 1 =1 with a borrow of from the next column

Note that : 1+1=10 and 10-1=1

Operation on number System

Example : Calculate $11101_2 - 1011_2$

Operation on number System

Example : Calculate $1101.10_2 - 101.1_2$

Operation on number System

Example : Calculate $35 - 23$ in binary system

Operation on number System

❖ Multiplication

0 x 0 = 0
1 x 0 = 0
0 x 1 = 0
1 x 1 = 1

Operation on number System

Example : Calculate $1101_2 \times 11_2$

Operation on number System

Example : Calculate $1101011_2 \times 10110_2$

Operation on number System

Example : Calculate $11.01_2 \times 101.1_2$

Operation on number System

❖ Division in binary

Example : Calculate $1010001_2 \div 11_2$

Operation on number System

Example : Calculate $1110111_2 \div 1001_2$

Operation on number System

- ❖ Complements
  - ➢ Nine complement and Ten complement

Decimal	234	7977
Nine Complement	765	2022
Ten Complement	766	2023

Operation on number System

Example : Calculate $B - A$ if $A = 8976$ *and* $B = 123012$ in Nine Complement and Ten Complement.

Decimal	Nine Complement	Ten Complement

Operation on number System

- One Complement and Two Complement

Binary	101101	1000110	111111011
One Complement	010010	0111001	000000100
Two Complement	010011	0111010	000000101

Operation on number System

Example : Calculate $B - A$ if $A = 1111_2$ and $B = 100010_2$ in One Complement and Two Complement.

Decimal	One Complement	Two Complement

Operation on number System

Example : Calculate 55-75 in one complement and two complement

Calculate all operation below

$$\begin{array}{r} 11001010 \\ +\ 10101101 \\ \hline \end{array} \qquad \begin{array}{r} 101011101 \\ -011000011 \\ \hline \end{array} \qquad \begin{array}{r} (7652)_8 \\ \times (245)_8 \\ \hline \end{array} \qquad \left(\frac{AB276E}{2A} \right)_{16}$$

Convert from Base 32 to Binary and show your step of converting.

a. $ABCD$

b. $54ABC$

c. $A2Z4BONG$

d. $MATHS$


Thank You