Itahar City Youth Computer Centre

Itahar, Porsha, (Opp. Of polytechnic College), Itahar, Uttar Dinajpur, 733128

Lesson	Topic	Class no.
Computer Fundamental	**Number System**	004

Fundamental Of Computer

➢ **Number system**

➢ **Binary | Decimal | Octal | Hexa Decimal |**

➢ **Conversion**

➢ **Question & Answer**

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Introduction of Computer

➢**Number system**

➢**Number system**

- ✓ **Decimal Number system**

- ✓ **Hexa Decimal Number system**

- ✓ **Octal Number System**

- ✓ **Binary Number system**

Introduction of Computer

➢Number system

What is Number System?

A number system is a way to write numbers using a consistent set of symbols or digits. It provides a unique representation for each number and shows the algebraic and arithmetic structure of numbers.

How many types of Number system available?

There are four types of number system –
(1) Binary, (2) Octal, (3) Decimal, (4) HexaDecimal

Introduction of Computer

➤Number system

Write a short note of all number system ?

•**Binary**
•Uses only the digits 0 and 1. Binary is useful in computers and electronic devices because it can be represented by the two states of on and off.

Octal
Uses the digits 0–7. Octal is advantageous because it uses fewer digits than decimal or hexadecimal.

•**Decimal**
•The most common number system, using the digits 0–9. The value of a digit depends on its position in the number. For example, in the number 49,365, the 4 is worth 40,000, the 9 is worth 9,000, and so on.

Hexadecimal
Uses the digits 0–9 and the letters A–F. Hexadecimal can represent large numbers with fewer digits.

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➢ **Number system**

	Decimal Number system	Hexa Decimal Number system	Octal Number System	Binary Number system
DIGIT	**BASE- 10** [0-1-2-3-4-5-6-7-8-9]	**BASE -16** [0-1-2-3-4-5-6-7-8-9-A-B-C-D-E-F]	**BASE - 08** [0-1-2-3-4-5-6-7-8]	**BINARY - 02** [0-1]
DIGIT	$(529)_{10}$	$(529)_{16}$	$(529)_8$	$(529)_2$

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➤**Number system decimal to conversion**

➤**Decimal to Binary** $(117)_{10} = (?)_2$

➤**Decimal to Octal** $(117)_{10} = (?)_8$

➤**Decimal to Hexa decimal** $(117)_{10} = (?)_{16}$

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➢**Number system decimal to conversion**

➢**Decimal to Binary** $(117)_{10} = (?)_2$

Decimal to Binary   Date ....

Q → $(117)_{10} = (?)_2$

Methode-1

```
2 | 117        Ans = 1110101
2 | 58 — 1      (1110101)₂
2 | 29 — 0
2 | 14 — 1
2 | 7 — 0
2 | 3 — 1
    1 — 1
```

Methode 2

128	64	32	16	8	4	2	1
1	1	1	0	1	0	1

Ans. $(1110101)_2$

```
 117
 -64
 ----
  53
 -32
 ----
  21
 -16
 ----
   5
  -4
 ----
   1
```

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➢ **Number system decimal to conversion**

➢ **Decimal to Octal** $(117)_{10} = (?)_8$

➢ **Number system decimal to conversion**

➢ **Decimal to Hexadecimal** $(117)_{10} = (?)_{16}$

Decimal to Hexa Decimal

$(117)_{10} = (\quad)_{16}$

$16 | 117$

$7 - 5$

$= (75)_{16}$

01110101

8	4	2	1
0	1	0	1	= 5
0	1	1	1	= 7

$= (75)_{16}$

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➢**Number system decimal to conversion**

➢**Binary to Decimal** $(10101)_2 = (?)_{10}$

Binary to Decimal

$(10101)_2 = (\quad)_{10}$

64	32	16	8	4	2	1
		1	0	1	0	1

$16 + 4 + 1$
$= (21)_{10}$

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➢**Number system decimal to conversion**

➢**Binary to Octal $(10101)_2 = (?)_8$**

Binary : to : octa

$(10101)_2 = (\quad)_8$

32	16	8	4	2	1
0	1	0	1	0	1

$$\frac{4\ 2\ 1}{1\ 0\ 1} = 5$$

$$\frac{ }{0\ 1\ 0} = 2 \uparrow$$

$$= (25)_8$$

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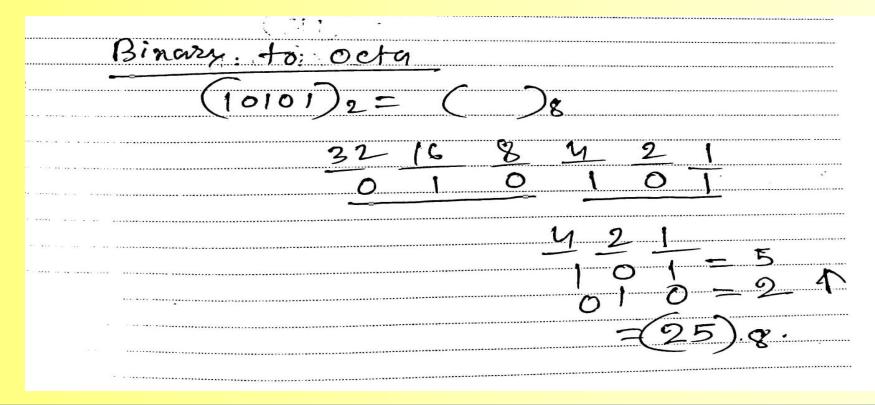
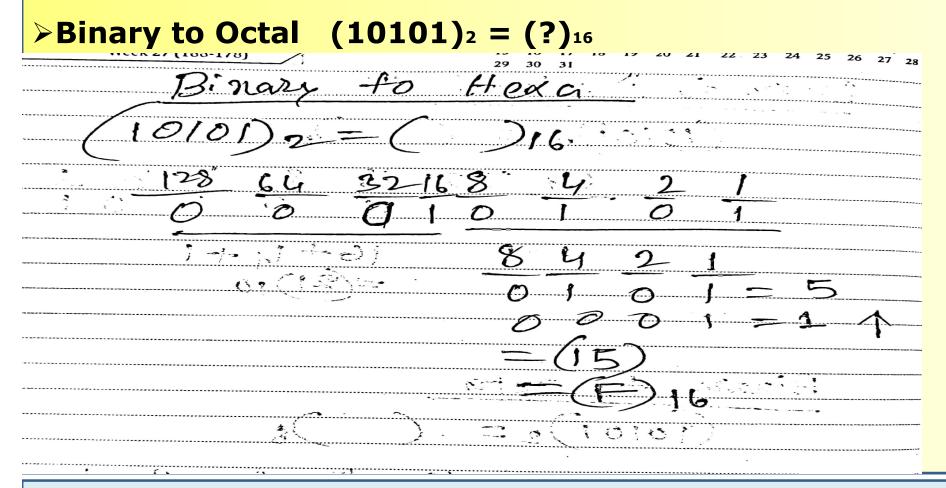## Introduction of Computer

➢ **Number system decimal to conversion**

➢ **Binary to Octal $(10101)_2 = (?)_{16}$**

Binary to Hexa.

$(10101)_2 = (\quad)_{16}$

128	64	32	16	8	4	2	1
0	0	0	1	0	1	0	1

8	4	2	1
0	1	0	1	= 5
0	0	0	1	= 1 ↑

$= (15)$

$= (F)_{16}$

$= (10101)$

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➢**Number system decimal to conversion**

➢**Octal to Hexa** $(345)_8 = (?)_{16}$

octal to Hexa

$(345)_8 = (\quad)_{16}$

3˙45

4	2	1	
1	0	1	= 5
1	0	0	= 4
0	1	1	= 3

$$\frac{3}{0\ 1\ 1} \quad \frac{4}{1\ 0\ 0} \quad \frac{5}{1\ 0\ 1}$$

$$= (0\ 1\ 1\ 1\ 0\ 0\ 1\ 0\ 1)_2$$

8	4	2	1	
0	1	0	1	= 5
1	1	1	0	= 14 → E

$$= (E5)_{16}.$$

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➢**Number system decimal to conversion**

➢**Hexa to Octal $(AEF)_{16} = (?)_{16}$**

Hexa to octal

$(AE5)_{16} = (\quad)_8$

$\quad A \qquad E \qquad 5$
$(1010 \quad 1110 \quad 0101)_2$

$(101011100101)_2$

$\begin{array}{cccc} 8 & 4 & 2 & 1 \\ 0 & 1 & 0 & 1 = 5 \\ 1 & 1 & 1 & 0 = E \\ 1 & 0 & 1 & 0 = A \end{array}$

$(5345)_8$

$\begin{array}{ccc} 4 & 2 & 1 \\ 1 & 0 & 1 = 5 \\ 1 & 0 & 0 = 4 \\ 0 & 1 & 1 = 3 \\ 1 & 0 & 1 = 5 \end{array}$