

binary with 5 bits

$\therefore$  Number in decimal  $= 16 + 8 + 4 + 2 + 1 = 31$

(Ans)  $(11111)_2, (31)_{10}$

④ What is the maximum number you can make using 5 bit in binary?

What is that number in decimal?

Ans: See. after answer of the question no. 3.

⑤ How many dots are there in the eight bit?

(Ans) The number of dots in 8th bit is  $2^{8-1} = 2^7 = 128$  (Ans)

② What is the maximum number you can make using 2 bits in binary what is the number in decimal form)

Solution:

$$\begin{array}{cc} \boxed{2} & + & \boxed{1} & = & 3 \\ 1 & & 1 & & \end{array}$$

∴ The maximum number in binary with 2 bits.

The number is 3 in decimal form, i.e.  $(11)_2 = (3)_{10}$

③ What will be the number of bit in binary form of the decimal number 4)

Solution:  $(4)_{10} = (100)_2$

100 is 3-bit number.

Rough

$$\begin{array}{r} 2 \overline{) 4} \\ \underline{2} \phantom{0} \\ 2 \overline{) 2} \\ \underline{2} \phantom{0} \\ 0 \phantom{0} \\ 0 \phantom{0} \\ 0 \phantom{0} \\ 0 \phantom{0} \end{array}$$

Solution

$$\begin{array}{ccccc} \boxed{16} & \boxed{8} & \boxed{4} & \boxed{2} & \boxed{1} \\ 1 & 1 & 1 & 1 & 1 \end{array}$$

∴ 11111 is the maximum number in

convert into binary from decimal

|   |    |   |
|---|----|---|
| 2 | 97 |   |
| 2 | 48 | 1 |
| 2 | 24 | 0 |
| 2 | 12 | 0 |
| 2 | 6  | 0 |
| 2 | 3  | 0 |
| 2 | 1  | 1 |
|   | 0  | 1 |

$$\therefore (97)_{10} = (1000011)_2$$

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① what is the highest number you can counting 4 bit in binary? what is that number in decimal form?

Ans: 18 4 2 1

1 1 1 1

$\therefore$  The highest number 1111 can be counted in binary with 4 bits,

## Capacity of Bit

| The power of 2 | Bit Number | The largest number in binary | Decimal values of the largest number |
|----------------|------------|------------------------------|--------------------------------------|
| $2^0 = 1$      | 1          | 1                            | 1                                    |
| $2^1 = 2$      | 2          | 11                           | 3                                    |
| $2^2 = 4$      | 3          | 111                          | 7                                    |
| $2^3 = 8$      | 4          | 1111                         | 15                                   |
| $2^4 = 16$     | 5          | 11111                        | 31                                   |

Table shows that the bit numbers 1-5 is their binary capacity.

Convert into decimal from binary

$$(101101)_2 = 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$

$$= 32 + 0 + 8 + 4 + 0 + 1$$

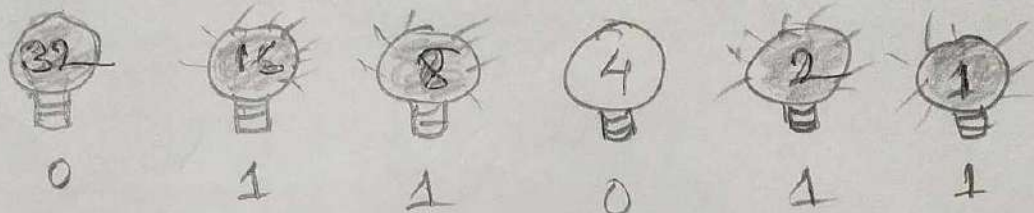
$$= (45)_{10}$$

$$(1101001)_2 = 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$

$$= 64 + 32 + 0 + 8 + 0 + 0 + 1$$

$$= (105)_{10}$$

## Binary Numbers



In fig, the bulbs with numbers 16, 8, 2 and 1 are lit while the bulbs with numbers 32 and 4 are off.

In this case the binary representation of 27 is 011011 (where the leading zero is optional)

$\therefore$  Binary form of  $(27)_{10} = (11011)_2$

In the same method, we can convert any binary number into a decimal number. For example 1101001 in a 7 bit binary number which is shown below using bulbs.



From the fig,  $(1101001)_2 = 64 + 32 + 8 + 1 = (105)_{10}$

Class: VII  
 Subject: Math  
 Module No: \_\_\_\_\_  
 Term: \_\_\_\_\_

Subject Teacher's Name: Kazi Md. Karim Hossain  
 Book Name: Mathematics

Chapter Name: 07

Topic: Story of Binary Numbers

| SL | Topic                                        | Class Needed |
|----|----------------------------------------------|--------------|
| 1. | Reading/ Discussion                          | 01           |
| 2. | Exercise/ CW                                 | 03           |
| 3. | Assignment:<br>Project Work/ Practical Topic | 01           |
| 4. | HW                                           | 01           |

Total Class Needed: 06

Requirement: 1. Tent book

2. Handout

3. A-4 size paper

✓  
Md. Karim