and will have 10 as the base. As you proceed from the right to the left, t face value changes but the base 10 remains the same. The same logic applied for Example 2.

BINARY NUMBER SYSTEM

The binary number system uses two digits, i.e., zero and one (0 and 1). Each individual binary digit is termed as a bit. Since it uses two digits, it has the base 2. Since a computer is unable to understand or decode human language, all digital computers convert the decimal input data into its binary equivalent and again converts the result in binary format to the decimal equivalent as the final output.

Fig. 3.1 *The binary number system two digits – 0 and 1*

A decimal number x is also represented as $(x)_{10}$. For example, de number 22 can also be written as $(22)_{10}$. Similarly, a binary number y i represented as $(y)_2$. For example, a binary number 1101 can also be w as $(1101)_2$.

Converting Decimal Input into its Binary Equivalent

Example:

Let's find out the binary of the decimal number 29.

2	29	1 → Least Significant Digit
2	14	0
2	7	1
2	3	1
1	1	1 → Most Significant Digit
	1	

mathematician, Gottfried Wilhelm Leibniz, who showed that the binary number system could be used in a primitive calculating machine.

HEXADECIMAL NUMBER SYSTEM

The hexadecimal number system consists of 16 digits, the numerals 0 to 9 and the letters from A to F. The numbers in this system are 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F. A stands for 10, B stands for 11, C for 12, D for 13, E for 14 and F for 15.

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

To convert a hexadecimal number to its decimal equivalent, multiply the number with base 16. Hexadecimal numerals are widely used for the representation of binary-coded values. Each hexadecimal digit represents four binary digits, also known as a nibble, which is half a byte. A hexadecimal number z is also represented as $(z)_{16}$.

A. Fill in the blanks.

10 bit 16 data 9

1. Data consists of raw values which are processed by computers to give information.
2. The base of the decimal number system is 10.
3. In the binary number system, each individual binary digit is termed as a bit.
4. The hexadecimal number system has digits from 0 to 9.
5. In the hexadecimal number system, divide a decimal number by 16 to get its hexadecimal equivalent.

B. Choose and tick the correct answer.

1. All the data input in the _____ memory is converted into numeric forms.
   a) calculator
   b) computer ✓
   c) cell phone
   d) abacus
2. A computer can only understand _____.
   a) letters of the English alphabet
   b) decimal codes
   c) binary codes ✓
   d) alphabets and numbers

3. To convert a decimal number into a binary number, divide the given number by _____

a) 10
b) 8
c) 4
d) 2

4. In the hexadecimal number system, alphabets _____ are used to denote numbers 10 to 15.

a) L to Q
b) M to R
c) A to F
a) C to H

5. The _____ number system uses the digits 0 to 7 for its functions.

a) decimal
b) octal
c) binary
d) hexadecimal

a novel! Data consists of values which are processed by computers and are converted into a logical form. This processed data is called information. The form in which data is stored, processed and transmitted is termed as Data Representation. Take a good look

Keywo

- **Data:** Ch
  or symb
  which c
  are per

multiplication and division.

2 DECIMAL NUMBER SYSTEM

In the decimal number system, only ten digits, which is the numbers from 0 to 9 are used to form any number. The base of the decimal number system is 10 as it uses 10 digits. We perform **arithmetic operations** with decimal numbers.

D. Answer the questions in brief.

1. Explain Data Representation. – 46
2. How are numbers represented in the decimal number system? – 47
3. What is the binary number system? Give an example of a binary number.
4. Distinguish between bit and byte.
5. Explain the hexadecimal number system.

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