Pioneers of
COMPUTER

Level 9

Microsoft® Windows® xp

Windows® 7

Windows® 8

CD-ROM

Contents

Introduction

Dear Teachers,

I introduce in this book my humble contribution in order to help you cope with the latest developments in the second millinuem, taking into consideration the needs of our dear students, who will be the leaders of the future and a new generation that will make the necessary changes for the interest of humanity. Therefore, I have adopted in my series the latest educational strategies based on ERFKE so as to create the proper educational environment, and build a generation that will be able to cope with information technology, and face the challenges imposed by the accelerating growth in the acquisition of information and skills, and to progress steadily toward employing technology in education. I strongly believe that students have the ability to promote progress in the country and achieve the aspirations of the nation by applying up- to- date methods which support the student and make him or her the core of the educational process. Development processes require more efficient roles in preparing and planning in the field of education, and using various proper educational resources and aids, and giving students chances to freely express their opinions through democratic and independent channels.

Dear Teachers,

Notice that the programs in this book are authorized in all publications and meet all specifications set by Microsoft. The materials included can be enriched by educational and recreational programs.

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Teacher's role in the teaching processes

- You're the leader.

- Listen to your student and let him express his own opinion.

- Encourage your student to participate, and ask him to try again when he makes a mistake.

- Encourage self-assessment.

- You're the guide. Let your students practice about 75%, of the time of the lesson.

- Encourage your students to use co-operative activities.

- Listen to your students. Vary your communication methods (Facilities, such as diagrams, figures, puzzles, comics).

- Use available technology as learning tools.

- Explain the lesson in short steps.

- Evaluate continuously their understanding.

- Use the work sheets to enrich the material.

- Give enough time to your students to practice activities, especially to students with special needs to finish the tasks.
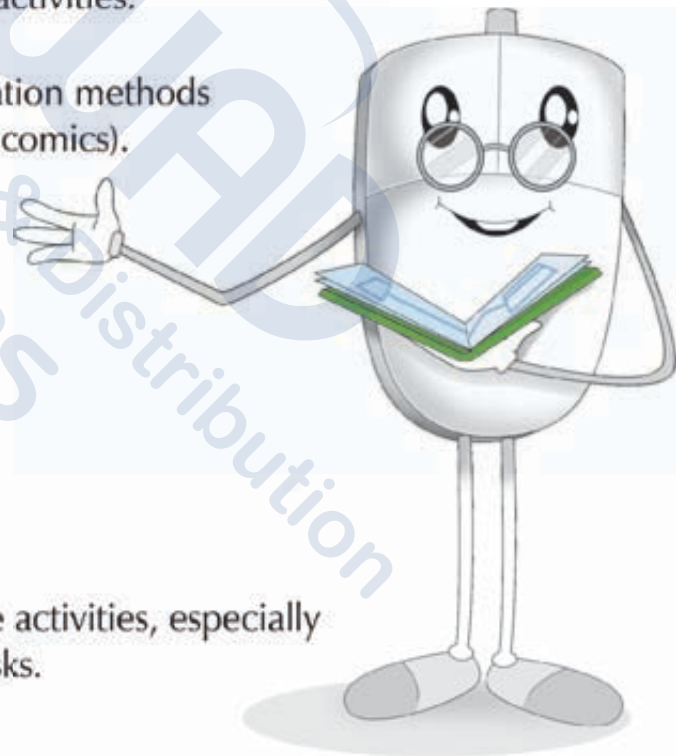
Numerical systems

in our daily lives we must study the numerical systems to automatically know how to handle computer data and digits, and to know also the operations that take place inside the computer to identify on the commands and the instructions that are given to the computer for it to complete a certain command such as a mathematical solutions or inserting data while dealing with it and printing information results.

Specific outcomes

Dear student you are expected to complete the following results after completing the unit.

❖ To identify and utilize numerical systems
❖ Identify the decimal system and its basics
❖ Identify numerical algorithms
❖ To identify the binary system and its basics
❖ Transferring numbers from the binary system to the decimal system
❖ To identify the eighth system
❖ Apply the rule of transferring between both the binary and eighth system
❖ Transfer from the binary to the eight system and vice verca
❖ Use the calculator to transfer between numerical systems
❖ Identify logical gates systems
❖ Write the truth or false tables for the logical gates : AND, OR, NOT.

The decimal system

The decimal system is considered one of the most important types of the numerical systems, as in it is used by human beings in our daily lives on daily basis, as the decimal systems is made up from 10 elements which are (0,1,2,3,4,5,6,7,8,9) as we are done from the last element (9) we go back to the element (0) and then we add the element (1) for it to become one zero (10) where it is named Ten as the decimal system because it contains 10 elements. Any system depends on the unit home places that number or the elements belongs to, as you may remember the counting system of this decimal system (units, tens, hundreds, thousands) from where did these naming come from? And how is it related to the basics of the decimal system? What are the basics of the decimal system?

Let us start with the basics of the decimal system as the basics of any counting system is the number of elements in the system where as the number of elements in the decimal system are ten then the basics of the decimal system is (10) and from here the units are $(10)^0 = 1$, and tens are $(10)^1 = 10$, and hundreds are $(10)^2 = 100$, and thousands are $(10)^3 = 1000$ etc. Look at the following diagram .

Units	Tens	Hundreds	Thousands	Thousands Tens
10^0	10^1	10^2	10^3	10^4
1	10	100	1000	10000

Complete the following table to identify the number (4297) using the basis of the decimal system:

	One`s	Tens	Hundreds	Thousands
Decimal Number	2	4	6	5
Status Value	10^0 X 2 = 1 X 2 = 2	10^1 X 4 = 10 X 4 = 40	10^2 X 6 = 100 X 6 = 600	10^3 X 5 = 1000 X 5 = 5000
Final Value	5000 + 600 + 40 + 2 = 5642			

Complete the following table to identify the number (4297) using the basis of the decimal system:

	Ones	Tens	Hundreds	Thousands
Decimal Number				
Status Value	x 10^0 = ☐ ☐ x 1 = ☐	x 10^1 = ☐ ☐ x 10 = ☐	x 10^2 = ☐ ☐ x 100 = ☐	x 10^3 = ☐ ☐ x1000 = ☐
Final Value				

Activity   **The decimal system**

- $3 \times 10^0 + 5 \times 10^1 + 2 \times 10^2 + 4 \times 10^3 =$

....

....

- $5 \times 10^0 + 2 \times 10^1 + 7 \times 10^2 + 8 \times 10^3 + 6 \times 10^4 =$

....

....

- $9 \times 10^0 + 4 \times 10^1 + 2 \times 10^2 + 3 \times 10^3 + 2 \times 10^4 =$

....

....

Questions

Q 1. Write the elements of the decimal system. ....

Q 2. Why is called the decimal system of that name ? ....

Q 3. What is the basis of the decimal system ? ....

Binary system

It is called binary system because of that reason to use two elements zero and one (0.1) and the computer uses the binary system in all its operations (calculations, storage and processing, etc.) because the binary system consists of two elements that represents the electric circuit. Number (1) represents the circuit voltage reached (ON) and the number (0) is a spare circuit voltage (OFF). Thus, the data is inserted in addition to decimal numbers into the computer to turn the binary system and to allow it to handle situations.

As counting in the decimal system, the next number after the last number in the group takes two standards. The first is downloaded as the first number (zero) and second number is the Number one to read "number (10)" therefore it is called (zero one) as we used in the decimal system, . Where in the binary digit will be the following after the last number in the group takes the two places; status than the first (0) and second place is the number (1) to read as follows (10) and read here (one zero) and not the number ten.

Example	1	Read the numbers in the numeral systems

Consequently, a table showing how readers and sequence numbers in the decimal system, binary:

● Decimal system:

0	1	2	3	4	5	6	7	8	9	10
zero	one	two	three	four	five	six	seven	eight	nine	zero one (ten)

● Binary system:

	0	1	10	11	100
	zero	one	one zero	one one	One zero zero
Decimal Number	0	1	2	3	4

Conversion from the Binary system to Decimal system:

The basis of the binary system is (numbers of elements of the system) and to represent the houses follow the following:

2^0	2^1	2^2	2^3	2^4	2^5	2^6	....
1	2	4	8	16	32	64	

Note that the following downloaded status equal to the previous number multiplied by 2, and will rely on the representation of status in the conversion process of the binary system to decimal system.

Activity   **Status Binary system**

Complete the following table status depending on the binary system:

2^6	2^7	2^8	2^9	2^{10}	2^{11}	2^{12}	....
64				1024			....

And indicate the type of system used when expressing numbers are put in brackets the number and write the foundation of the yellow beyond the arc, as in the next issue $(1011)^2$

Example **2** **Convert Binary to Decimal**

Change value of binary number $(10011)_2$ to the decimal system.

Binary No.	1	1	0	0	1
Status value	$2^0 \times 1 =$ $1 \times 1 = 1$	$2^1 \times 1 =$ $2 \times 1 = 1$	$2^2 \times 0 =$ $4 \times 0 = 0$	$2^3 \times 0 =$ $8 \times 0 = 0$	$2^4 \times 1 =$ $16 \times 1 = 16$
Decimal No.	$16 + 0 + 0 + 2 + 1 = 19 \longrightarrow (10011)_2 = (19)_{10}$				

Example **3** **Convert Binary to Decimal**

Change value of binary number $(101\ 011)_2$ to the decimal system.

Status value	1	2	4	8	16	32
Binary No.	1	1	0	1	0	1
Status value	$1 = 1 \times 1$	$2 \times 1 = 2$	$4 \times 0 = 0$	$8 \times 1 = 8$	$16 \times 0 = 0$	$32 \times 1 = 32$
Decimal No.	$1 + 2 + 0 + 8 + 0 + 32 = 43 \longrightarrow (101011)_2 = (43)_{10}$					