PON VIDYASHRAM GROUP OF SENIOR SECONDARY SCHOOLS

APRIL NOTES

SUBJECT : COMPUTER SCIENCE **CLASS : VII**

CHAPTER – I (NUMBER SYSYTEMS)

A. CHOOSE THE CORRECT ANSWER

1. Binary numbers use only two digits ……and …….. .

   (a) 12,29 **(b) 0,1** (c) 101,100
2. Which number system is normally used in mathematics?

   (a) Binary **(b) Decimal** (c) Hexadecimal

3. Digits from 0 to 7 are used in …….. number system.
   (a) Decimal (b) Binary **(c) octal**

4. Ten is the base of this number system.
   (a) Binary **(b) Decimal** (c) octal

5. The digit 8 is not used in this number system.
   (a) Decimal **(b) Octal** (c) Hexadecimal

B. FILL IN THE BLANKS.

1. A number system can be defined as a system of writing that is used for expressing **Numbers.**

2. The base for the **decimal** number system is 10.

3. The **face** value of a digit is the digit itself.

4. The **binary** Number system consists of two digits only,that is, digit 0 and digit 1.

5. Any data given to a computer is first converted into binary code for **processing.**

C. WRITE ‘T’ FOR TRUE AND ‘F’ FOR FALSE FOR THE FOLLOWING STATEMENTS.

1. In binary subtraction, 1-1 equals to 0. **(True)**

2. In the hexadecimal number system, six letters used are A, B, C, D, E and F. **(True)**

3. The binary number system consists of two digits 0 and 1. **(True)**

4 .The octal number system makes use of eight digits, that is, 1, 2, 3, 4, 5, 6, 7 and 8. **(False)**

5.The place value of a digit in a number depends on the position of the digit in the number.**(True)**

D. DIFFERENTIATE BETWEEN THESE.

1. Decimal number system and Binary number system

Decimal number system	Binary number system
• This system uses 10 digits(0,1,2,3,4,5, 6, 7, 8, 9) to form a number. • This number system is based on 'tens' because there are ten digits.. • The digits in a number have their place value, such as ones, tens, hundreds, thousands, etc. • In every number of the Decimal number system, the value of each digit is ten times more than the digit	• The binary language is based on the binary number system , there are only two symbols 0 and 1. • The base of the binary number system is 2. • 0 (zero) and 1(one) when used in combinations as codes are called binary digit is called a bit. • Each bit in the binary number is given a positional value in terms of increasing powers of 2starting with the extreme right or the rightmost bit. A dat (.) in decimal number system is known as binary point

2. Hexadecimal number system and Octal number system

Hexadecimal number system	Octal number system
• This number system contains 16 symbols, thus it has the base 16. • It consists of 10 digits and 6 letters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F. • The letters represent numbers starting from 10, A = 10, B = 11, C = 12, D = 13, E = 14, F = 15. • Each position in a hexadecimal number represents a power of the base (16)	• The octal number system is formed of 8 digits, 0 to 7 with the base 8. • Each position in an octal number represents a power of the base (8) • Exampe 8°. The last position in an octal number represents the x power of the base (8). • For example, 8^x where x represents the last position.

	Example, 16^{o}. The last position in a hexadecimal number represents the x power of the base (16).	

E. SHORT ANSWER QUESTIONS.

1. Name the different number systems.

Some of the we-known number systems are:

- Decimal number system
- Binary number system
- Octal number system
- Hexadecimal number system

2. Write symbols used in the binary number system.

Binary numbers are commonly written using the symbols 0 and 1.

3. What is meant by an octal number system? Give an example.

Number system is formed of 8 digits, i.e. 0 to 7 with the base 8. The process of octal- to-decimal conversion is similar to binary-to- decimal conversion. The only difference is the change of base. Each position in an octal number represents a power of the base (8), for example, 8°. The last position in an octal number represents the x power of the base (8). For example, 8" where x represents the last position.

4. What is meant by a hexadecimal number system? Give an example.

This number system contains 16 symbols, thus it has the base 16. It consists of 10 digits and 6 letters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F. The letters represent numbers starting from 10, A = 10, B = 11, C = 12, D = 13, E = 14, F = 15. Each position in a hexadecimal number represents a power of the base (16), for example, 16^{o}. The last position in a hexadecimal number represents the x power of the base (16). For example, 16' where x represents the last position.

F. LONG ANSWER QUESTIONS.

1. What is the decimal number system? Explain.

mathematics, we use decimal number system.This system uses 10 digits 01,2,3,4,5, 6, 7, 8, 9) to form a number. This number systern is based on ‘tens’digits. The digits in a number have their place value, such as ones, tens, hundres nu thousands, etc. In every number of the Decimal number system, the value of each digit is ten times more than the digit just to its right. Let us understand this with an example

In the number 1234,

4 signifies 4 x $10^{\circ}=4\times1=4$

3 signifies 3 x 10 = 3 x 10 = 30

2 signifies 2 x 10^{2} = 2 x 100 = 200

1 signifies 1 x 10 = 1 x 1000=1000

Adding them up gives.

4+30+200+1000 = 1234,

The digits in a number signify different values depending on the position they occupy in the number. Thus, we can say that the value of each digit in a number depends upon the following:

➤ The face value of the digit

➤ The base of the number system

➤ The position of the digit in the number

In a number, the digit written on the extreme right is called the Least Significant Digit and the digit written on the extreme left is called the Most Significant Digit. For example in the number 29346, the digit 2 is the most significant digit whereas the digit 6 is called the least significant digit.

2. What is the binary number system? Explain.

A computer can only understand the binary or machine language which consists of 0s and 1s. A computer is an electronic machine and thus knows only two states ON (representer To by 1) and OFF (represented by 0). The binary language is based on the binary number system.

In this number system , there are only two symbols 0 and 1. when used in combinations as codes are called binary Numbers. A single binary digit is called a bit.

Each bit in the binary number is given a positional value in terms of increasing powers of 2starting with the extreme right or the rightmost bit. A dat (.) in decimal number system is known as binary point

3. What rules should be followed while converting the decimal number system into binary number system and vice-versa?

Rules to be followed before converting decimal numbers into binary numbers are:

➤ Divide the given decimal number with the base 2 and note the remainder (whether it is 0 or 1).

➤ Again divide the quotient obtained in the first division by 2. Note down the remainder.

➤Repeat step 2 till the quotient becomes 0.

➤ The remainder obtained as a result of all the divisions needs to be arranged in a

definite sequence, i.e. from bottom to top as in the example, the binary equivalent of $(32)_{10}$ is $(100000)_2$

4. What will you get when you add $(1111)_2$ and $(1011)_2$? Get answer in decimal and binary number systems both.

Binary		Decimal
1 1 1 1 →	$1x2^3 +1x2^2+1x2^1+1x2^0$ = 8+4+2+1 =	15
+ 1 0 1 1 →	$1x2^4+1x2^3+0x2^2+1x2^1+0x2^0$ = 16+8+0+2 =	+11
1 1 0 1 0		26