CHAPTER 1: NUMBER

NUMBER

Numbers are mathematical symbol by which we express date, time, distance, position, quantity etc.

We use ten symbols (0, 1, 2. 3, 4, 5, 6, 7, 8, 9) to write any number.

Example: 346562232, 34654521155, 4003444656 etc.

➢ NUMBER SYSTEM

Number system deals with the study of different types of numbers. In this chapter, we will study about the categorization of different types of numbers.

❖ Natural Numbers

Counting starts with 1 and continue till infinite. Counting numbers are called natural numbers.

For example: 1, 2, 3, 4, 5, 6, 7 .....etc.

❖ Whole Numbers

When 0 is included with natural numbers, they are called whole number. In other words "Natural numbers together with zero are called whole numbers."

For example: 0, 1, 2, 3, 4, 5, 6, 7 .....etc.

❖ Integers

Integers are the collection of whole numbers and negative of natural numbers.

For Example: - 5, - 4, - 3, - 2, - 1, 0, + 1, + 2, + 3, + 4, + 5, + 6, + 7..... Etc.

❖ System of Numeration

Mathematical notation of numbers is called numeration. Let us know about two types of numeration.

(a) Indian system of numeration

(b) International system of numeration

❖ Indian System of Numeration

It is a positional decimal number system. Look at the following place value chart

Period	Places	
Kharab	Ten Kharab (T - kh)	1000000000000
	Kharab (kh)	100000000000
Arab	Ten Arab (T - A)	10000000000
	Arab (A)	1000000000
Crores	Ten Crores (T - C)	100000000
	Crores (C)	10000000
Lakhs	Ten Lakhs (T - L)	1000000
	Lakhs (L)	100000
Thousands	Ten Thousand (T - TH)	10000
	Thousands (TH)	1000
Ones	Hundred (H)	100
	Tens (T)	10
	Ones (O)	1

Example:

Name the number, indicated in the place value chart:

Period	Places		
Kharab	Ten Kharab (T - kh)	1000000000000	13
	Kharab (kh)	100000000000	12
Arab	Ten Arab (T - A)	10000000000	11
	Arab (A)	1000000000	10
Crores	Ten Crores (T - C)	100000000	9
	Crores (C)	10000000	8
Lakhs	Ten Lakhs (T - L)	1000000	7
	Lakhs (L)	100000	6

Thousands	Ten Thousand (T - TH)	10000	5
	Thousands (TH)	1000	4
Ones	Hundred (H)	100	3
	Tens (T)	10	2
	Ones (O)	1	1

Solution:

Fourteen kharab two arab sixty five crore twenty one lakh three thousand two hundred fifty three.

❖ International System of Numeration

This system is applied in whole world. The following place value chart shows the international system of numeration.

Period	Places	
Trillions	Hundred Trillion	100000000000000
	Ten Trillions	10000000000000
	Trillions	1000000000000
Billion	Hundred billions	100000000000
	Ten billions	10000000000
	Billions	1000000000
Million	Hundred million	100000000
	Ten million	10000000
	Millions	1000000
Thousands	Hundred thousand	100000
	Ten thousand	10000
	Thousands	1000
Ones	Hundred	100

	Tens	10
	Ones	1

Example:

Name the number indicated in the place value chart.

Period	Places		
Trillions	Hundred Trillion	100000000000000	15
	Ten Trillions	10000000000000	14
	Trillions	1000000000000	13
Billion	Hundred billions	100000000000	12
	Ten billions	10000000000	11
	Billions	1000000000	10
Million	Hundred millions	100000000	9
	Ten millions	10000000	8
	Millions	1000000	7
Thousands	Hundred thousands	100000	6
	Ten thousands	10000	5
	Thousands	1000	4
Ones	Hundred	100	3
	Tens	10	2
	Ones	1	1

Solution:

Five hundred forty six trillion five hundred sixty eight billion twenty two million sixty five thousands two hundred fifteen.

❖ Place Value

Place value of a digit in a number is the position it occupies according to the place value chart.

Example:

Find the place value of 5 in the number 646568232.

Solution: 500000

❖ Face Value

Face value of a number is the number itself.

Example:

Find the face value of 3 in the number 451453282.

Solution: 3

❖ Successor

The number which comes just after a number is called successor of that number.

Example:

Find the successor of 5456446.

Solution: 54564446 + 1 = 54564447

❖ Predecessor

Predecessor of a number just comes before the number.

Example:

Find the predecessor of 4665655416.

Solution: 4665655416 ? 1 = 4665655415

❖ Roman Numeral

Roman numerals the number using alphabetical symbols.

The seven alphabetical symbols, which are used in Roman system of numeration, and their values are as follows:

Symbols	Value

I	1
V	5
X	10
L	50
C	100
D	500
M	1000

❖ Rules for Using Symbols

Rule 1: When a symbol is repeated, its value is multiplied as many times as the symbol is repeated.

Example:

II = 2 × 1 = 2

XXX = 3 × 10 = 30

Rule 2: The symbols I, X, C, M can be repeated in a roman numeral.

Example:

CCC = 3 × 100 = 300

MM = 2 × 1000 = 2000

Rule 3: The symbols V, L, and D can not be repeated.

Example:

DD = 2 × 500 = 1000

But 1000 is represented by symbol M.

Therefore, the above expression is not correct.

Rule 4: If a symbol of smaller value is right to the symbol to greater value, their values are added.

Example:

LV = 50 × 5 = 55

DC = 500 × 100 = 600

Rule 5: If a symbol of smaller value is left to the symbol of greater value, their difference is the resulting value.

Example:

VL = 50 – 5 = 45

CD = 500 – 100 = 400

Rule 6: If a symbol of smaller value comes between two symbols of larger value, its value is subtracted from the value of the symbol, which is right to it.

Example

XIV = 10 + 5 – 1 = 14

DXC = 500 + 100 – 10 = 590

Look at the following table:

1	I	11	XI	200	CC
2	II	20	XX	3OO	CCC
3	III	3O	XXX	400	CD
4	IV	40	XL	500	D
5	V	50	L	600	DC
6	VI	60	LX	700	DCC
7	VII	70	LXX	800	DCCC
8	VIII	80	LXXX	900	CM
9	IX	90	XC	1000	M
10	X	100	C	1001	MI

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

Note: A symbol cannot be repeated more than 3 times.