Large Numbers

Notes

EXTENSION OF NUMBERS

We know that the largest 8-digit number is 99999999. It is read as nine crore ninety-nine lakh ninety-nine thousand nine hundred ninety-nine.

If we add 1 to this number, we get 99999999 + 1 = 100000000.

We read it as ten crore. We have to represent this number in place value chart. Nδw, the crores period has two places, one of crores and the other is ten crores.

EXTENSION OF NUMBERS

Place Value Chart

CRORES		LAKHS		THOUSANDS		ONES		
Ten Crores	One Crore	Ten Lakh	One Lakh	Ten thousand	One thousand	Hundreds	Tens	Ones
10000000	10000000	1000000	100000	10000	1000	100	10	1
1	0	0	0	0	0	0	0	0
2	3	5	7	2	1	2	5	4

235721254

For example, see the number 235721254 (a 9-digit number) in the above place value chart. We read it as twenty-three crore fifty-seven lakh twenty-one thousand two hundred fifty-four.

From the above place value chart, we find that the value is increasing 10 times as we move from right to left i.e. from ones to crores.

We write the place values in the tabular form as follows :

Periods →	Crores		Lakhs		Thousands		Ones		
Numbers	Ten crores	Crores	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
1 = one									1
10 = ten								1	0
100 = One hundred							1	0	0
1000 = One thousand						1	0	0	0
10000 = Ten thousands					1	0	0	0	0
100000 = One lakh				1	0	0	0	0	0
1000000 = Ten lakhs			1	0	0	0	0	0	0
10000000 = One crore		1	0	0	0	0	0	0	0
100000000 = Ten crores	1	0	0	0	0	0	0	0	0

READING AND WRITING OF NUMBERS

First period in the above table having three places is called the ones period. The next period having two places is called the thousands period. The next period having two places is called the lakhs period. Similarly, next the crores period consists of two places. We separate the periods by putting a comma (,)

EXAMPLE 1 : ***Read the following numbers and write them in words :***

(i) 73254263 (ii) 325725324

Also, write the above numerals in a place value chart form.

SOLUTION : (i) 73254263 = 7,32,54,263

= Seven crore thirty-two lakh fifty-four thousand two hundred sixty-three

(ii) 325725324 = 32,57,25,324

= Thirty-two crore fifty-seven lakh twenty-five thousand three hundred twenty-four

Place Value Chart

Numbers	Ten crores	Crores	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
(i) 73254263		7	3	2	5	4	2	6	3
(ii) 325725324	3	2	5	7	2	5	3	2	4

INTERNATIONAL SYSTEM OF NUMERATION

The British System is called the International System. In this system, only 3 Periods—Ones, Thousands and Millions are used to group the first nine places. These places are grouped in three periods. Here, all the digits of a period are read together and the name of the period (except the ones) is read along with them.

The places in various periods are given below :

Periods →	Millions			Thousands			Ones		
Places →	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

EXAMPLE 2 : ***Rewrite the following numbers, separating the digits in periods, using the Indian Place Value :***

(i) 24563232 ***(ii) 257325437***

SOLUTION : **(i) 24563232 = 2,45,63,232**

(ii) 257325437 = 25,73,25,437

EXAMPLE 3 : ***Using International System of Numeration, write the number-names for each of the following numerals :***

(i) 132572819 (ii) 185323251

SOLUTION : **(i) 132572819 = 132,572,819**

= One hundred thirty-two million five hundred seventy-two thousand eight hundred nineteen

(ii) 185323251 = 185,323,251

= One hundred eighty-five million three hundred twenty-three thousand two hundred fifty-one

COMPARISON

Now let us compare 'Indian System of Numeration' and 'International System of Numeration' using the numbers (i) 515253632 and (ii) 725454726.

To include more than 9 places in International System of Numeration, the place-value chart can be extended. The period just to the left of million is called BILLIONS PERIOD. It also consists of three places, **One-billion Place, Ten-billions and Hundred-billions Place.**

I. Comparison of Numerals

Periods →	Crores		Lakhs		Thousands		Ones		
Indian System	Ten Crores	Crores	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
(i)	5	1	5	2	5	3	6	3	2
(ii)	7	2	5	4	5	4	7	2	6
Inter-national System	Hundred Millions	Ten Millions	Millions	Hundred	Ten Thousands	Thousands	Hundreds	Tens	Ones
Periods →	Millions			Thousands			Ones		

II. Comparison of Number-names

Indian System	International System
(i) 51,52,53,632 Fifty-one crore fifty-two lakh fifty-three thousand six hundred thirty-two	515,253,632 Five hundred fifteen million two hundred fifty-three thousand six hundred thirty-two
(ii) 72,54,54,726 Seventy-two crore fifty-four lakh fifty-four thousand seven hundred twenty-six	725,454,726 Seven hundred twenty-five million four hundred fifty-four thousand seven hundred twenty-six

PLACE-VALUE OF A DIGIT

Every digit in a numeral has two values :

(i) Face value **(ii) Place value or Local value**

The place value of a digit depends upon its position it occupies in the number. It is given by :

Place value = Face value × Value of the place

For example, in 32753281, the digit 7 is at one lakhs place. So, its place value is given by 7 × 100000 i.e. 700000. Of course, its face value is 7.

EXAMPLE :

Find the place value of all digits in the numeral 725725798

SOLUTION :

Digit	Face value of the Digit	Value of the Place of the digit	Place-value of the		Digit
7	7	Ten crores	7 × ten crores	=	700000000
2	2	One crore	2 × one crore	=	20000000
5	5	Ten lakhs	5 × ten lakhs	=	5000000
7	7	One lakh	7 × one lakh	=	700000
2	2	Ten thousands	2 × ten thousands	=	20000
5	5	One thousand	5 × one thousand	=	5000
7	7	One hundred	7 × one hundred	=	700
9	9	Tens	9 × tens	=	90
8	8	Ones	8 × ones	=	8

EXAMPLE : ***Write 257825234 in expanded form.***

SOLUTION : 257825234 = 25,78,25,234

= 2, ten crores + 5, one crore + 7, ten lakhs + 8, one lakh + 2, ten thousands + 5, one thousand + 2, hundreds + 3, tens + 4, ones

= 200000000 + 50000000 + 7000000 + 800000 + 20000 + 5000 + 200 + 30 + 4