MATHEMATICS

Class-VI

Topic-01

KNOWING OUR NUMBERS

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CHAPTER 01

Knowing our numbers

TERMINOLOGIES

Natural Numbers, whole numbers, predecessor, successor, face value, place value, indian system , international system , estimation , roman numerals

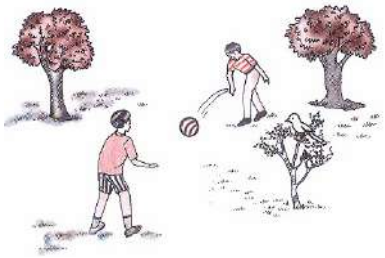
INTRODUCTION

Knowing our numbers help us in counting objects in large numbers and representing them through numerals. Numbers help in communicating through suitable number names and to count concrete objects.
We use numbers and know many things about them. We can also add ,subtract, multiply and divide them. Looking for patterns in numbers, finding the greatest and smallest numbers or the place value and face value of a digit and many other interesting things regarding numbers were also studied.

1.1 NUMBERS

(a) Natural Numbers

Look at the picture and answer these questions :



1. How many birds are there ?
2. How many persons are there ?
3. How many trees are there ?

The answer to these questions are respectively 1, 2 and 3.
But what are 1,2,3 ? They are symbols representing the first three counting numbers.
Counting numbers are called **natural numbers**.
Thus 1, 2, 3, 4, 5, 6 ...., etc ., are all natural numbers.

(b) Whole Numbers

All natural numbers together with 0 (zero) are called **whole numbers**.
Thus, 0, 1, 2, 3, 4 ....., etc., are whole numbers.
Clearly, every natural number is a whole number but every whole number is not a natural number as 0 is a whole number which is not a natural number.

(c) Predecessor- Successor of a Number

Predecessor :
Predecessor is 1 less than the given number.
For Ex. : Predecessor of 59028 is 59027.

Successor :
Successor is 1 more than the given number.
Successor of 9999 is 10000.

(d) Comparison of Numbers

(a) Greater number has more number of digits.
(b) To compare two numbers having same number of digits, start comparing from the left most position. If the leftmost digits are equal, move to the next digits.

Illustration 1.1

Which is greater of 270346 and 48356?

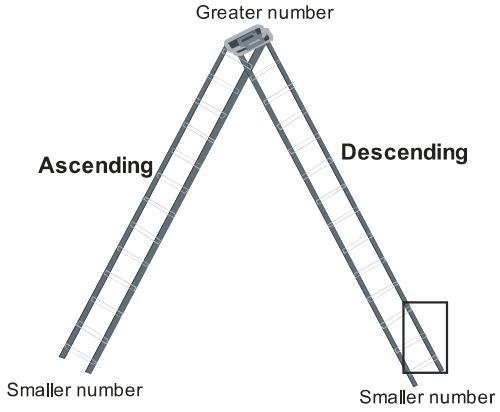
Sol. 270346 has 6 digits
48356 has 5 digits
6 digits are more than 5 digits
∴ 270346 is greater than 48356
or 270346 > 48356
Greater number has more number of digits

Illustration 1.2

Find the greatest and the smallest numbers from the following group of numbers :
23787,6895, 24569, 24659

Sol. Greatest number : 24659
Smallest number : 6895

Ascending And Descending Order :



Ascending order – arrangement of numbers from smallest to largest
Descending order – arrangement of numbers from largest to smallest

Illustration 1.3

Arrange the following numbers in ascending order : 257536, 38952, 385081, 365062

Sol. The smallest number is 38952. Other numbers greater than 38952, in order are 257536, 365062 and 385081.
∴ The numbers in ascending order are :
38952, 257536, 365062, 385081

Illustration 1.4

Arrange the following numbers in descending order : 19710, 887151, 453212, 925473

Sol. The greatest number is 925473. Other numbers smaller than 925473 in order are 887151, 453212 and 19710.
∴ The numbers in descending order are :
925473, 887151, 453212, 19710

(e) Face value and Place Value:

The basis of the number system is place value. It is the place value which gives value to the number.

Definition :

Face value of a digit in a numeral is the value of the digit itself at whatever place it may be.

Place value of a digit in a given number is the value of the digit because of the place or the position of the digit in the number.

Place-value of a digit = Face-value of a digit × value of the place

Place value and Face Value :

Every digit has two values – the place value and the face value. The face value of a digit does not change while its place value changes according to its position and number.

Number	Digit	Face Value	Place Value
53,694	5	5	50,000
	3	3	3,000
	6	6	600
	9	9	90
	4	4	4

(f) Expanded Form

If we express a given number as the sum of its place value, it is called its expanded form.

Illustration 1.5

Express

(i) 3,64,029 **(ii)** 2,75,00,386 in expanded form.

Sol. Place value of $3 = 3 \times 100000$

Place value of $6 = 6 \times 10000$

Place value of $4 = 4 \times 1000$

Place value of $0 = 0 \times 100$

Place value of $2 = 2 \times 10$

Place value of $9 = 9 \times 1$

$\therefore$ The expanded form of 3,64,029 is

$3 \times 100000 + 6 \times 10000 + 4 \times 1000 + 0 \times 100 + 2 \times 10 + 9 \times 1$

Likewise, the expanded form of 2,75,00,386 is

$2 \times 10000000 + 7 \times 1000000 + 5 \times 100000 + 0 \times 10000 + 0 \times 1000 + 3 \times 100 + 8 \times 10 + 6 \times 1$

Let us take a number, for example: 2,45,13,768.

C	TL	L	T-Th	T	H	T	O
2	4	5	1	3	7	6	8

Here the place value of 2 is 2,00,00,000 (two crore).

The place value of 4 is 40,00,000 (forty lakh).

The place value of 5 is 5,00,000 (five lakh).

The place value of 1 is 10,000 (ten thousand).

The place value of 3 is 3000 (three thousand)

The place value of 7 is 700 (seven hundred).

The place value of 6 is 60 (sixty).

The place value of 8 is 8 (eight).

In words : Two crore forty-five lakh thirteen thousand seven hundred sixty-eight.

In figures : 2, 45, 13, 768

In expanded notation : $2,00,00,000 + 40,00,000 + 5,00,000 + 10,000 + 3,000 + 700 + 60 + 8$

$= 2 \times 1,00,00,000 + 4 \times 10,00,000 + 5 \times 1,00,000 + 1 \times 10,000 + 3 \times 1000 + 7 \times 100 + 6 \times 10 + 8 \times 1$

Illustration 1.6

Write the following in expanded form and write the place value of the digit 3 in each case.

(a) 6307825 **(b)** 80930090

Sol. **(a)** 6307825 = 6000000 + 300000 + 7000 + 800 + 20 + 5
Place value of 3 is 300000

(b) 80930090 = 80000000 + 900000 + 30000 + 90
Place value of 3 is 30000

Illustration 1.7

Write the short form of 8000000 + 60000 + 500 + 30 + 9

Sol.

	T-L	L	T-Th	Th	H	T	O
	8	0	0	0	0	0	0
			6	0	0	0	0
					5	0	0
						3	0
							9
Number	**= 8**	**0**	**6**	**0**	**5**	**3**	**9**

(g) Indian & International System Of Numeration

Suppose a newspaper report states that Rs.2500 crore has been allotted by the government for National Highway construction. The same amount of Rs.2500 crore is sometimes expressed as Rs. 25 billion. In the Indian system, we express it as Rs. 2500 crore and in the International system, the same number is expressed as 25 billion. Hence we need to understand both the systems and their relationship.

INDIAN SYSTEM OF NUMBERS

Crores		Lakhs		Thousands		Ones		
Ten Crore	One Crore	Ten Lakh	One Lakh	Ten Thousand	One Thousand	One Hundred	Ten	One
10,00,00,000 9 Digits	1,00,00,000 8 Digits	10,00,000 7 Digits	1,00,000 6 Digits	10,000 5 Digit	1,000 4 Digits	100 3 Digits	10 2Digits	1 1 Digit

INTERNATIONAL SYSTEM OF NUMBERS

Billions			Millions			Thousands			Ones		
Hundred Billion	Ten Billion	One Billion	Hundred Million	Ten Million	One Million	Hundred Thousand	Ten Thousand	One Thousand	One Hundred	Ten	One
100,000,000,000 12 Digits	10,000,000,000 11 Digits	1,000,000,000 10 Digits	100,000,000 9 Digits	10,000,000 8 Digits	1,000,000 7 Digit	100,000 6 Digits	10,000 5 Digits	1,000 4 Digits	100 3 Digit	10 2 Digit	1 1 Digit

(i) Reading and Writing of Numbers :

In Indian System of numbers, we divide the given number into periods starting from the right. The first, period called units, period consists of 3 digits while each of the next periods called thousands period, lakhs period, crores period respectively consists of 2 digits. Each period is separated by a comma (,).
In International System of Numbers we make groups of 3 digits starting from right and separate each group by using a comma (,).

Now consider the six digit number 764325. In the Indian system, the number 7 is in the place of lakh and therefore the number is named as seven lakh sixty-four thousand three hundred twenty-five. It is written as 7,64,325. In the International system, this number is named as seven hundred sixty-four thousand three hundred twenty-five and is written as 764,325. The first three digits form the right-hand side are considered as ones, i.e., 325 ones and the next three digits to the left of the digit 3 are considered as thousands, i.e. 764 thousands.

Illustration 1.8

Write the name of the numbers according to Indian system of numeration .
(a) 1275834 **(b)** 30870209

Sol. **(a)** 12,75,834 = Twelve lakh seventy five thousand eight hundred thirty four

(b) 3,08,70,209 = Three crore eight lakh seventy thousand two hundred nine

Illustration 1.9

Write the name of the number according to International system of numeration.
(a) 7452283 **(b)** 48049831 **(c)** 699985102

Sol. **(a)** 7452283 = 7,452,283 = Seven million four hundred fifty two thousand two hundred eighty three.

(b) 48049831= 48,049,831= Forty eight million forty nine thousand eight hundred thirty one.

(c) 699985102 = 699,985,102 = Six hundred ninety nine million nine hundred eighty five thousand one hundred two.

(h) Making Numbers

(i) Making number without repetition of digits :

In case of non-repetition of digits, it is better if we start making the number from left.

Illustration 1.10

Write the greatest and the smallest 5-digit numbers by using each of the digits 8, 4, 7, 0, 2 only once.

Sol. For the greatest number, we write the greatest digit 8 in the T-thousands column. Next smaller digit in the thousands column and so on.

$\therefore$ The greatest number = 87420.

T-Th	Th	H	T	O
8	7	4	2	0

For the smallest number, we write the smallest digit in the T-thousands column. But here 0 is the smallest digit. 0 is not written on the extreme left of a number. So, we write 2 in the T-thousands column and 0 in the thousands column. Next digit greater than 2 is written in the hundreds column and so on.

$\therefore$ The smallest number = 20478

T-Th	Th	H	T	O
2	0	4	7	8

Illustration 1.11

Make the greatest and the smallest 5-digit numbers using any five different digit with 4 in the tens place.

Sol. First of all write 4 in the tens column. For the greatest number, we write the greatest digit 9 in the T-thousands column, next smaller digit in the thousands column so on.

T-Th	Th	H	T	O
9	8	7	4	6

$\therefore$ The greatest number = 98746

For the smallest number also, write 4 in the tens column first of all. Then write 0 in the thousands column . Write 1 in the T-thousands column. Next greater digit in the hundreds column and so on.

$\therefore$ The smallest number = 10243

T-Th	Th	H	T	O
1	0	2	4	3

(ii) Making number with repetition of digits :

In case of repetition of digit, it is better if we start making number from right.

Illustration 1.12

Write the greatest and smallest numbers of 4 digits using all the digits 8,0, 5.

Sol. For greatest number, select the smallest digit 0 and write in the ones column. Next greater digit is written in the tens column. Next greater digits 8 is written in the hundreds column. Since no digit greater than 8 given, so we repeat 8 in the thousands column.

Th	H	T	O
8	8	5	0

Greatest Number

∴ The greatest number = 8850

For smallest number, select the greatest digit 8 and write in the ones column. Next smaller digit in tens column and so on. Repeat the smallest digit in the end. But here 5 is smaller than 8 and then comes 0 which cannot be repeated in the end.

So, we write 5 in the end and repeat 0 in the tens place.

Th	H	T	O
5	0	0	8

Smallest Number

∴ The smallest number = 5008

NOTE:

i. For greatest number, greatest digit is repeated.

ii. For smallest number, smallest digit is repeated.

Ask ycurself

1. Subtract the successor of 99 from the predecessor of 201.

2. Arrange the following in ascending order : 1345, 87654, 98845, 10034, 2453

3. Write the expanded form of the following :
(a) 87609 **(b)** 900376

4. How many millions make 3 crores ?

5. Write the number 999999998 in the Indian system in numeral form and in words.

6. Form the largest and smallest 4-digit number using digits 9,3,0 ,1.

7. What is the smallest 3-digit number which does not change if digits are written in reverse order.

Answers

1. 0 **2.** 2453 , 1345, 10034 , 87654, 98845. **3.** **(a)** 87609 **(b)** 900376

4. 10

5. 99 ,99 ,99 ,998 = Ninety Nine Crores Ninety Nine Lakhs Ninety Nine Thousand Nine hundred and Ninety Eight.

6. Largest = 9310 , Smallest = 1039 **7.** 101

1.2 ESTIMATION

You must have come across news headlines involving large numbers. For example, '50,000 people participated in the marathon.' '5 lakh people gathered for a dip in the Ganges.'

We also see and read news about disasters, strikes, bandhas, etc. For example,

'80 crore rupees lost due to the fire.'

'9 lakh people evacuated.'

'The loss due to bandh is 1 crore.'

The numbers mentioned above do not represent the exact number of people or rupees. They are only speaking of a nearest value.

Rounding up off numbers is an approximation. This means that when we speak of 50,000 people, what we really mean is the crowd was between 45,000 and 55,000.

This rounding up helps us to get approximate answers in addition, subtraction, multiplication and division.

Suppose Rs.3847 and Rs.8348 are the costs of a DVD player and a T.V., respectively. If a friend asked you how much you paid for these two items, you need not to add the correct value of each. You can say that it costs you around Rs. 12,000. When we are cooking for a party, the approximate number of people expected for the party, and the approximate quantity of each item required per person are considered. Similarly, the quantity of things to be purchased for a party, the amount of cement to be purchased to construct a wall, the amount of paint to be bought to paint a house are all approximations.

(a) Estimating (Rounding) to the Nearest Ten

To round off a number to the nearest ten consider the ones digit. If the ones digit is 5 or greater than 5, then change the ten's digit to the next higher digit and ones digit to zero. If the ones digit is less than 5, then leave the tens digit unchanged but change the ones digit to zero.

(b) Estimating (Rounding) to the Nearest Hundred

To round off a number to the nearest hundred, consider the tens digit. If the ten's digit is 5 or greater than 5, then change the hundreds digit to the next higher digit and tens, ones digits to zeros. If the tens digit is less than 5, then leave the hundreds digit unchanged but change the tens and ones digits to zeros.

(c) Estimating (Rounding) to the nearest Thousand

To round off a number to the nearest thousand, consider the hundreds digit. If this digit is 5 or greater than 5, then change the thousands digit to the next higher digit and change all the other digits before that to zeros. If the hundreds digit is less than 5, then leave the thousands digit unchanged but change all the other digits before that to zeros.

Illustration 1.13

Estimate and compare with the actual sum

(a) 730 + 998 **(b)** 12904 + 2888

Sol. **(a)** We round off to the nearest hundred

730 is rounded off to 700

998 is rounded off to 1000

Estimated sum = 1700

Actual sum = 730 + 998

= 1728

Estimation is quite reasonable.

```
  700
+ 1000
------
 1700

  730
+ 998
------
 1728
```

(b) We round off to the nearest thousand

12904 is rounded off to 13000

2888 is rounded off to 3000

Estimated sum = 16000

Actual sum = 12904 + 2888 = 15792

Estimation is quite reasonable

```
 13000
+ 3000
------
 16000

 12904
+ 2888
------
 15792
```

Illustration 1.14

Give a rough estimate and also a close estimate of 439 + 334 + 4317

Sol. Rough estimate : 400 + 300 + 4000 = 4700

For closer estimate, we round off to the nearest hundred

439 is rounded off to 400

334 is rounded off to 300

4317 is rounded off to 4300

Closer estimated sum = 5000

```
  400
  300
+4300
-----
 5000
```

Illustration 1.15

Estimate 8325 – 491

Sol. If we round off to thousand, we get

8325 rounds off to 8000

491 rounded off to 0

Estimated difference = 8000 – 0 = 8000

This does not give a reasonable difference, so we round off to the nearest hundred.

8325 rounds to 8300

491 round to 500

Estimated difference = 7800

This is reasonable estimation.

(e) Estimation in Products

While estimating in products, we adopt the following rules :

(i) Round each factor to its greatest place, in other words, if a factor contains 2 digits, round it off to the nearest ten and if it contains 3 digits, then round it off to the nearest hundred and so on.

(ii) Do not round off any 1-digit factor.

Illustration 1.16

Estimate the following products :

(a) 87 × 313 **(b)** 9 × 795 **(c)** 898 × 785

Sol. **(a)** 87 is rounded off to 90

313 is rounded off to 300

∴ Estimated product = 90 × 300 = 27000

(b) 9 is not rounded off [∴ it is a one-digit no.]

795 is rounded off to 800

∴ Estimated product = 9 × 800 = 7200

(c) 898 is rounded off to 900

785 is rounded off to 800

∴ Estimated product = 900 × 800 = 720000

(f) Estimation in Quotients

In the process of estimation in quotients, we round off the dividend and the divisor before the process of division.

Illustration 1.17

Estimate the following quotients

(a) 81 ÷ 17 **(b)** 7525 ÷ 365

Sol. **(a)** 81 is rounded to 80

17 is rounded to 20

To get the estimated quotient think of dividing 80 by 20 or 8 by 2.

∴ Estimated quotient = = 4

(b) 7525 is rounded to 8000

365 is rounded to 400

To get the estimated quotient think of dividing 80 by 4.

∴ Estimated quotient = 20

Ask yourself

1. Estimate the following by rounding off each factor to nearest hundreds:

(a) 730 + 998 **(b)** 673 – 458

2. Estimate the following by rounding off each factor to nearest thousands :

(a) 21397 + 27807 + 42505 **(b)** 28292 – 21496

3. Estimate the following by rounding off each number to its greatest place :

(a) 439 +334+ 4317 **(b)** 108734-47599

(c) 87 × 317 **(d)** 4489 ÷ 394

4. Estimate the product of 183 × 153 by rounding off the first number upwards and the second number downwards.

5. Give a rough estimate and a closer estimate of 4,89,342 - 48,365.

Answers

1. **(a)** 1700 **(b)** 200 **2.** **(a)** 90000 **(b)** 10000

3. **(a)** 4700 **(b)** 50000 **(c)** 27000 **(d)** 10 **4.** 30000 **5.** 5450000

1.3 USE OF NUMBERS IN EVERYDAY LIFE

Numbers are used immensely in our everyday life, such as measuring the length of a small object as pencil, the distance between two given places ; the weight of an orange, the weight of a ship, the amount of juice in a glass and the amount of water in a lake.

Small lengths are measured in millimetre (mm) and centimetre (cm) while bigger lengths are measured in metre (m) and kilometre (km).

Metre (m) is the standard unit of length and we define it as

1 m = 100 cm = 1000 mm

∴ 1 cm = 10mm

∴ 100 cm = 100 × 10 = 1000 mm

1 km = 1000 m

Also, 1 km = (1000 m × 1000 mm) = 1000000 mm

Similarly, the units of weight are as under

1 gm = 1000 mg

1 kg = 1000gm

$\therefore$ 1 kg = (1000 gms $\times$ 1000) mg = 1000000 mg

For capacity or volume,

1 L = 1000 mL and 1 kL = 1000 L

1 kL = 1000 L $\times$ 1000 mL = 100000 mL

Illustration 1.18

A tin of biscuits has 14 kg of biscuits. Express the weight in milligrams.

Sol. Since 1 kg = 1000 gm and

1 gm = 1000 mg

$\therefore$ 1 kg = (1000 $\times$ 1000) mg = 1000000 mg

$\Rightarrow$ 14 kg = 14 $\times$1000000 mg =14000000 mg

Illustration 1.19

The population of Rajasthan is 5,64,73,122 , of Goa is 13,43,998 and of Karnataka is 5,27,33,958. What is the combined population of the three states.

Sol. Population of Rajasthan = 5,64,73,122

Population of Karnataka = 5,27,33,958.

Population Goa = 13,43,998

$\therefore$ Total population of three states = 5,64,73,122 + 13,43,998 + 5,27,33,958 = 11,05,51,078

i.e. Eleven crore five lakh fifty one thousand seventy eight.

Illustration 1.20

What must be added to 34,52,629 to make it equal to 6 crore.

Sol. 6 crore = 6,00,00,000

$\therefore$ required number = 6,00,00,000 – 34,52,629 = 5,65,47,371

Illustration 1.21

There are 785 students on roll in a residential public school. If the annual fee per student is Rs. 62, 606. What is the total fee collected annually by the school.

Sol. Annual fee of one student = Rs. 62,606

Number of student = 785

$\therefore$ Total annual collection of fee = Rs. 62,606 $\times$ 785 = Rs . 4, 91, 45, 710

Illustration 1.22

Find the number of pages in a book which has on an average 207 words on a page, and contains 201411 words altogether.

Sol. Number of pages = 201411 $\div$ 207 = 973

Thus, the number of pages in the book = 973

Ask yourself

1. India's population has been steadily increasing from 439 millions in 1961 to 1028 millions in 2001. Find the total increase in popular from 1961 to 2001. Write the increase in population in Indian System of Numeration, using commas suitably.

2. In 2001, the populations of Tripura and Meghalaya were 3,199,203 and 2,318,822, respectively. Write the populations of these two states in Indian System of Numeration.

3. Out of 180000 tablets of Vitamin A, 18734 are distributed among the students in a district. Find the number of the remaining vitamin tablets.

4. Chinmay had Rs 610000. He gave Rs 87500 to Jyoti, Rs 126380 to Javed and Rs 350000 to John. How much money was left with him ?

5. A factory has a container filled with 35874 litres of cold drink. In how many bottles of 200 ml capacity each can it be filled ?

6. A box contains 50 packets of biscuits each weighing 120g. How many such boxes can be loaded in a van which cannot carry beyond 900kg ?

7. A merchant has 120 litres of oil of one kind, 180 litres of another kind and 240 litres of a third kind. He wants to sell the oil by filling the three kinds of oil in tins of equal capacity. What should be the greatest capacity of such a tin ?

Answers

1. 589 million , 58,90,00,000 = Fifty Eight Crores Ninety Lakhs

2. 3,199,203 = Three Million One Hundered and Ninety Nine Thousand Two Hundred and Three 2,318,822 = Two Million Three Hundred and Eighteen Thousand Eight Hundred and Twenty Two

3. 161,266 **4.** Rs . 396120 **5.** 179370 **6.** 150 Boxes

7. 60 Liters

1.4 ROMAN NUMERALS

One of the earliest systems of writing numerals is the Roman Numeral system. This system is still in use in many places. For example, some faces of clocks show hours in Roman numerals; we use Roman numerals to write numbered list; etc.

Unlike the Hindu-Arabic numeral system, Roman numeral system uses seven basic symbols to represent different numbers. The symbols are as follows :

I = 1, V = 5, X = 10, L = 50, C = 100

D = 500, M = 1000

(a) Rules To Form Roman Numerals

We can form different Roman numerals using the symbols and the following rules.

Rule-1 If a symbol is repeated one after the other, its value is added as many times as it occurs. For example

III = 1 + 1 + 1 = 3

XX = 10 + 10 = 20

Rule-2 The symbols I, X, C and M can be repeated up to a maximum of three times. For example

I = 1,
II = 2,
III = 3
X = 10,
XX = 20,
XXX = 30
C = 100,
CC = 200,
CCC = 300
M = 1000,
MM = 2000,
MMM = 3000

Rule-3 The symbols V, L and D (i.e., 5, 50, and 500 respectively) can never be repeated in a Roman numeral.

Rule-4 If a symbol with a smaller value is written on the right of a symbol with a greater value, then its value is added to the value of the greater symbol. For example
XII = 10 + 2 = 12,
LX = 50 + 10 = 60,
DCCCX = 500 + 300 + 10 = 810

Rule-5 If a symbol with a smaller value is written on the left of a symbol with a larger value, then its value is subtracted from the value of the greater symbol. For example,
IV = 5 – 1 = 4, IX = 10 – 1 = 9, CD = 500 – 100 = 400,
VI = 5 +1 = 6, XI = 10 + 1 = 11, DC = 500 + 100 = 600

Rule-6 The symbols V,L and D are never written to the left of a symbol of greater value i.e. V,L and D are never subtracted
The symbol I can be subtracted from V and X only.
The symbol X can be subtracted from L, M and C only.
The symbol C can be subtracted from D and M only.

Rule-7 If a bar is placed over a numeral , it is multiplied by 1000.
$\bar{V}$ = 5000 , $\bar{L}$ = 50000

Illustration 1.23

Write the Roman Numerals

(a) 105 **(b)** 213 **(c)** 4592 **(d)** 5839

Sol. **(a)** 105 = 100 + 5 = CV **(b)** 213 = 200 + 10 + 3 = CCXIII
(c) 4592= DXCII **(d)** 5839 = DCCCXXXIX

Illustration 1.24

Write in Hindu Arabic numerals:

(a) CXXXV **(b)** CXLI **(c)** $\bar{V}\bar{I}$ CMXXI **(d)** $\bar{X}\bar{L}\bar{I}$ CCVI

Sol. **(a)** CXXXV = C + XXX + V = 100 + 30 + 5 = 135
(b) CXLI = C+XL+ I = 100 + 40 +1 = 141
(c) $\bar{V}\bar{I}$ CMXXI = $\bar{V}\bar{I}$ + CM + XX + I = 6000+ 900+ 20 + 1 = 6921
(d) $\bar{X}\bar{L}\bar{I}$ CCVI = $\bar{X}\bar{L}\bar{I}$ + CC + VI = 41000 + 200 + 6 = 41,206

Ask yourself

1. Express each of the following numbers as a Roman numerals :
(a) 26 **(b)** 63 **(c)** 72 **(d)** 99
(e) 556 **(f)** 769 **(g)** 26495

2. Write each of the following in Hindu-Arabic numeral :
(a) CLXVI **(b)** CDXLVI **(c)** DCCLXVI **(d)** CLXIX
(e) CDXCV

3. Which of the following are meaningless ?
(a) XD **(b)** LVV **(c)** MMMCCXI **(d)** CCS

4. Find the greatest among IV, V, VI and VII

5. Write the sum of XX and XXIX in Roman numerals.

Answers 1. **(a)** XXVII **(b)** LVIII **(c)** LXXII **(d)** XCIX
(e) DLVI **(f)** DCCIX **(g)** $\overline{XXVI}$CDXCV
2. **(a)** 166 **(b)** 446 **(c)** 766 **(d)** 169
(e) 495
3. (a) , (b) ,(d) **4.** VII **5.** XLIX

Add your knowledge

(a) What comes after a million ? Billion , Trillion , Quadrillion , Quintillion , Sextillion , Septillion, Octillion, Nonillion, Decillion and Undecillion.

(b) From number 0 to 1000 , the letter ' A' only appears in 1000 (One thousand)

(c) **Prime numbers :** Prime numbers are natural numbers greater than 1 and each of which is divisible by 1 and by itself only. For example : 2, 3, 5, 7, 11, 13, 17, 19, 23, ... etc.

(d) If unit digit is x and tens digit is y, then two digit number is of the form 10y+x.

(e) **Divisibility :**

Division Algorithm : General representation of result is,

$$\frac{\text{Dividend}}{\text{Divisor}} = \text{Quotient} + \frac{\text{Remainder}}{\text{Divisor}}$$

Dividend = (Divisor × Quotient) + Remainder

Concept Map

Knowing Our Numbers

Face Value and Place Value

Face Value and Place Value of number 2423

Face Value of 2 at tens and thousand place is 2

Place value of 2 is 2000 and 200

System of Numbers

1. Indian System

Crores		Lakhs		Thousands		Ones		
Ten Crore	One Crore	Ten Lakh	One Lakh	Ten Thousand	One Thousand	One Hundred	Ten	One
10,00,00,000 9 Digits	1,00,00,000 8 Digits	10,00,000 7 Digits	1,00,000 6 Digits	10,000 5 Digit	1,000 4 Digits	100 3 Digits	10 2 Digits	1 1 Digit

2. International System

Billions			Millions			Thousands			Ones		
Hundred Billion	Ten Billion	One Billion	Hundred Million	Ten Million	One Million	Hundred Thousand	Ten Thousand	One Thousand	One Hundred	Ten	One
100,000,000,000 12 Digits	10,000,000,000 11 Digits	1,000,000,000 10 Digits	100,000,000 9 Digits	10,000,000 8 Digits	1,000,000 7 Digit	100,000 6 Digits	10,000 5 Digits	1,000 4 Digits	100 3 Digit	10 2 Digit	1 1 Digit

Making Numbers

→ Without repetition

Smallest Number → Write the digits in ascending

Greatest Number → Write the digits in order descending order

→ With Repetition

Smallest Number → Smallest digit is repeated

Greatest Number → Greatest digit is repeated

Roman Numerals

I → 1

V → 5

X → 10

L → 50

C → 100

D → 500

M → 1000

Estimation

Estimation in Sum

(1) 267 + 132

↓ ↓

300 + 100 = 400

(2) 59 + 238

↓ ↓

60 + 240 = 300

Estimation in Difference

(1) 53 – 18

↓

50 – 20 = 30

(2) 409 – 48

↓

410 – 50 = 360

Estimation in Product

(1) 42 × 58

↓

40 × 60 = 2400

(2) 387 × 31

↓

400 × 30 = 12000

Estimation in Quotient

(1) 94 ÷ 34

↓ ↓

90 ÷ 30 = 3

(2) 627 ÷ 23

↓ ↓

600 ÷ 20 = 30

Summary

1. The set of natural numbers is N = { 1,2,3, ... }

2. The set of whole numbers is W = { 0,1,2,3, ... }
   Both the above sets are infinite sets i.e. there is no greatest number.

3. The smallest natural number is 1 and the smallest whole number is 0.

4. The Successor of a given whole number is 1 more than the given number , e.g. the Successor of 25 is 26.

5. The Predecessor of a given whole number is 1 less than the given number , e.g. the Predecessor of 100 is 99.

6. Every digit in a numeral has two values - the Place value and the Face value.
   (a) The face value of a digit does not change
   (b) The place value changes according to its position in the number. Each place represents ten times the one which is immediately to its right , e.g. in the number 5555 starting from the right place values of 5's are 5, 50, 500,5000 respectively, while the face value remains same i.e.,5

7. There are two system of numeration - the Indian and the International.
   (a) In Indian system of numeration, the periods are crores, lakhs, thousands and units
   (b) In International system of numeration , these are billions, millions, thousands and units.

8. For rounding off a number to the nearest 10,100,1000..ets. we look at the digits at a lower place , i.e. ones , tens , hundreds, ... etc.If the digits at ones, tens or hundred is less than 5, the number is rounded off downwards otherwise upwards.

9. Roman numeration system has seven basic symbols as
   I for 1 V for 5 X for 10 L for 50 C for 100 D for 500 M for 1000

EXERCISE 01

SECTION -A (FIXED RESPONSE TYPE)

MULTIPLE CHOICE QUESTIONS

1. The successor of 49,999 is :
(A) 49,998 (B) 50,000 (C) 49,990 (D) 49,000

2. Which one of the following is the smallest numeral ?
(A) 15673 (B) 15700 (C) 15198 (D) 15623

3. 789500 comes just after :
(A) 789400 (B) 789501 (C) 789499 (D) 789498

4. The place value of 9 in 7690453 is:
(A) 900 (B) 9000 (C) 90000 (D) 90

5. Which digit is at thousands place in 57, 168 :
(A) 6 (B) 7 (C) 1 (D) 8

6. The product of the place values of two 2's in 428721 Is
(A) 4 (B) 40000 (C) 400000 (D) 40000000

7. 3 x 10000 + 7 x 1000 + 9 x 100 + 0 x 10 + 4 Is the same as
(A)3794 (B)37940 (C) 37904 (D)379409

8. In Indian system of Numeration, the number 58695376 is written as
(A) 58,69,53,76 (B) 58695,376 (C) 5,86,95,376 (D) 586,95,376

9. Express seventy-four thousand five hundred seventy in figures:
(A) 74560 (B) 74580 (C) 74570 (D) 74571

10. 9745679 is smaller than one crore by
(A) 254000 (B) 254321 (C) 254799 (D) 254856

11. The successor of the greatest 4- digit number is
(A) 9999 (B) 9998 (C) 9909 (D) 10000

12. The largest number using each of digits 5, 7, 8, 9 is :
(A) 9875 (B) 5879 (C) 8759 (D) 7589

13. The smallest 4-digit number using 2, 0, 9, 5 is :
(A) 9520 (B) 0295 (C) 2059 (D) 5209

14. The largest 4 - digit number , using any one digit twice , from digits 5,9,2 and 6 Is
(A) 9652 (B) 9562 (C) 9659 (D) 9965

15. Find the difference in the place value of the digit 5 in the number 57568.
(A) 49500 (B) 45900 (C) 49000 (D) 49050

16. In the product of 37 and 23, what is the place value of the digit which is prime ?
(A) 500 (B) 700 (C) 800 (D) 50

17. What is the difference of 1 million and 900 tens?
(A) 100900 (B) 991000 (C) 91000 (D) 919000

18. How much is 50 less than by 1 million ?
(A) 9950 (B) 99950 (C) 999950 (D) 9999950

19. How many numbers of 3-digit are formed by using the digits 0, 1, and 2 ?
(A) 5 (B) 6 (C) 10 (D) 4

20. Using the digits 1, 4, 6 and 8 each only once, how many four digit odd numbers can be formed?
(A) 4 (B) 5 (C) 3 (D) 6

21. When rounded off to nearest thousands, the number 85642 Is
(A) 85600 (B)85700 (C) 85000 (D)86000

22. The greatest number which on rounding off to nearest thousands gives 5000, Is
(A)5001 (B)5559 (C) 5999 (D)5499

23. Rough estimate (by rounding off to nearest tens) of 439 + 334 + 4317 will be
(A) 4055 (B) 5550 (C) 5090 (D) 5975

24. Which of the following numbers when rounded off to the nearest ten thousand gives 500000 ?
(A) 492811 (B) 495213 (C) 589200 (D) 513076

25. Which one of the following is the best estimation of 5663 × 2234 ?
(A) 5000 × 2000 (B) 5700 × 2200 (C) 5660 × 2230 (D) 5660 × 2300

26. 1 quintal = ... kg
(A) 10 (B) 100 (C) 1000 (D) 100000

27. 2km +1m +3cm = ……
(A) 200101cm (B) 200102cm (C) 200103cm (D) 200104cm

28. What is the cost of a banana, if one dozen banana costs Rs. 24-
(A) 3 (B) 2 (C) 4 (D) 1

29. A train moves at a uniform speed of 45km/hr. How much distance will it cover in 36 hours?
(A) 1630 (B) 1640 (C) 1620 (D) 1615

30. Weight of one bag is 14Kg 35g. The weight of 18 bags is
(A) 250Kg 300g (B) 252Kg 130g (C) 252Kg 630g (D) 253Kg 630g

31. LXV can be written in Hindu Arabic numeral as :
(A) 55 (B) 60 (C) 65 (D) 70

32. I as a Roman numeral , am CMXCIX. Break me up and then can you recognize me ?
(A) 9910 (B) 999 (C) 1109 (D) 1119

33. The greatest among IV, V, VI or VII would be
(A) IV (B) V (C) VI (D) VII

34. Which of the number shown below is meaningless ?
(A) VIII (B) XX (C) XVI (D) VXXX

35. Which of the following numbers in Roman numerals Is Incorrect?
(A) LXXX (B) LXX (C) LX (D) LLX

FILL IN THE BLANKS

1. Smallest natural number is _____

2. 1 crore = _____ lakh

3. The smallest 4-digit number with four different digits is _____.

4. The total number of 4 digit number is _____

5. 564 when estimated to the nearest hundred is _____.

6. 1678 when estimated to the nearest thousand is _____.

7. 100 m =___ cm

8. 650 km =____ m

9. Which symbols are never repeated____

10. The predecessor of XI is the whole number ___

TRUE / FALSE

1. 99999 just comes before 1000000.

2. The successor of the greatest 5-digit number is 100000.

3. The difference in the face value and the place value of 5 in 85419 is 85414.

4. 100 lakhs make a million .

5. The estimated value of 46,530 to the nearest hundred is 46500.

6. The estimated value of 450 to the nearest hundred is 400.

7. 1km = 100 m

8. 100m = 1cm

9. In Roman numeration, a symbol is not repeated more than three times.

10. In Roman numeration. If a symbol is repeated. Its value is multiplied as many times as it occurs.

11. XXIX = 31

12. LXXIV = 74

13. The number LIV Is greater then LVI.

MATCH THE COLUMN

1.

	Column–I		**Column–II**
(A)	1 crore	(p)	1,000,000
(B)	1 million	(q)	100,000
(C)	100 thousand	(r)	10, 00,000
(D)	10 billion	(s)	1,00,00,000
(E)	10 lakh	(t)	10,000,000,000

2.

	Column–I		**Column–II**
(A)	9547999 comes just before	(p)	0
(B)	287 round off to nearest ten	(q)	3 times
(C)	15 round off to nearest hundred	(r)	9548000
(D)	I , X ,C ,M can be repeated of maximum of	(s)	repeated
(E)	V , L ,D are never	(t)	290

SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1. Write the Predecessor of 7000 ?

2. Which is greater 72389 and 72391 ?

3. Arrange the following in ascending order:
2345, 2543,3452,4325,2435

4. Write the greatest and the smallest 5 digits numbers by using each of the digits 3, 5, 7, 0, 9 only once ?

5. Write the greatest and smallest numbers of 4 digits using all the digits 7,0, 6 ?

6. Estimate the 278 x 361 products (by general rule)

7. Estimate the following (by rounding off to nearest thousands):
(a) 3,456 **(b)** 7,850

8. Alok and Anuj worked as salesperson at a bookstore. They sold 6283 story books in all. Anuj sold 3324 story books. How many story books were sold by Alok?

9. In an election, the successful candidate registered 4,67,350 votes and his nearest rival secured 2,18,800 votes. By what margin did the successful candidate win the election?

10. Write in numbers:
(a) IX **(b)** LXV

11. Write in Roman numerals:
(a) 12 **(b)** 34

SHORT ANSWER TYPE

12. As per the census of 2001 , the population of four states are given below . Arrange the states in ascending and descending order of their population.

(A) Maharashtra 96878627
(B) Andhra Pradesh 76210007
(C) Bihar 82998509
(D) Uttar Pradesh 166197921

13. Write the place value of each digit of number 560271

14. Find the difference between place value and face value of digit 6 in 298654

15. Find the product of place value of 8 and face value of 2 in 92486

16. Write the following numbers in expanded notation.

(a) 2,84,231 **(b)** 52,11,568 **(c)** 6,04,18,517 **(d)** 8,91,81,213

17. Write the following numbers as numerals.

(a) Sixty two lakh forty five thousand six hundred thirty five
(b) Nine crore fifty eight lakh sixty one thousand eighty nine

18. In 2001, the population of Tripura and Meghalaya were 3,199,203 and 2,318,822, respectively. Write the populations of these two states in words.

19. How many lakhs make five billions?

20. Estimate the product of 287 × 231 by rounding off the first number upwards and the second number downwards.

21. Give a rough estimate and a closer estimate of 4,89,342 - 48,365.

22. 12 drums of milk have 84 litres of milk in them. Find the capacity of one drum in millilitres.

23. Radius of the Earth is 6400km and that of Mars is 4300000m. Whose radius is bigger and by how much?

24. Write the equivalent Roman numeral of each of the following Hindu-Arabic numeral.

(a) 46 **(b)** 90 **(c)** 120 **(d)** 150

25. Write the equivalent Hindu Arabic numerals of the following Roman numerals.

(a) XXII **(b)** CCX **(c)** DCC **(d)** LXIII

LONG ANSWER TYPE

26. According to the 1991 census, the number of people who spoke the following languages were:

Assamese : 13079696
Hindi : 337272114
Konkani : 1760607

(a) Write the above numbers according to the Indian and International system of numeration.
(b) Write the above numbers in words according to the Indian system of numeration.
(c) Write the above numbers in words according to the International system.

27. Write all possible three digit numbers (without repeating the digits), by using the digits.
(i) 6, 7, 5 **(ii)** 9, 0, 2

28. Use the given digits without repetition and make the smallest and the greatest four digit numbers.
(i) 2, 1, 5, 6 **(ii)** 7,8,0,9 **(iii)** 4, 6, 3, 5 **(iv)** 8, 3, 2, 4
(v) 2, 5, 9, 0 **(vi)** 1, 9, 6, 3

29. Make the greatest and the smallest four digit numbers by using any one digit twice :
(i) 6, 3, 2 **(ii)** 1, 0, 6 **(iii)** 7, 9, 4 **(iv)** 2, 5, 0

30. Make the greatest and the smallest 4-digit numbers using any four different digits, with the condition given below :
(i) Digit 6 is always in thousands place **(ii)** Digit 4 is always in hundreds place
(iii) Digit 7 is always in tens place **(iv)** Digit 1 is always in ones place
(v) Digit 9 is always in thousands place **(vi)** Digit 0 is always in hundreds place
(vii) Digit 5 is always in tens place **(viii)** Digit 3 is always in ones place

31. A mobile number consists of ten digits. First four digits are 9,9,7 and 9. Make the smallest mobile number by using only one digit twice from 8,3,5,6,0.

32. In a five digit number, digit at ten's place is 4, digit at unit's place is one fourth of ten's place digit, digit at hundred's place is 0, digit at thousand's place is 5 times of the digit at unit's place and ten thousand's place digit is double the digit at ten's place. Write the number.

33. Estimate each of the following by rounding off each number to nearest hundreds:
(a) 874 + 478 **(b)** 793 + 397
(c) 11244 + 3507 **(d)** 17677 + 13589

34. Give the approximate value by estimating.
(a) 3228 + 572 **(b)** 8010 – 2507
(c) 32 x 58 **(d)** 108 x 47

35. The number of candidates appearing for class 10 board examination conducted by CBSE was 14, 58, 937 in year 2002; 16, 93, 487 in year 2003; 24, 13, 468 in year 2004 and 40, 05,093 in year 2005. Find the total number of candidates who appeared for the examination in these four years.

36. The number of scooters produced in a year was 25, 43, 163. Out of these 16,43, 078 were sold. How many were still left ?

37. A milk depot sells 657 litres of milk every day. How much milk will it sell in 1 year ?
(Take 1 year = 365 days)

38. The students of class VI of a school collected Rs. 3, 37, 875 for Prime Minister's Relief fund. If each child contributed Rs. 255, how many children are there in the school ?

39. The diameter of Jupiter is 142800000 meters. Insert commas suitably and write the diameter according to International system of Numeration.

40. India's population has been steadily increasing from 439 million in 1961 to 1028 millions in 2001. Find the total increase in population from 1961 to 2001. Write the increase in population in Indian System of Numeration , using commas suitably.

41. In a city, polio drops were given to 2,12,583 children on Sunday in march 2008 and 2,16,813 children in the next month . Find the difference of the number of children getting polio drops in the two months.

42. Solve the following:

(a) V - I **(b)** VII - IV **(c)** IX - III **(d)** XL - VII

43. Solve the following:

(a) X + V **(b)** V + III **(c)** XV + II **(d)** IX + IX

(e) VI + II

EXERCISE 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)

MULTIPLE CHOICE QUESTIONS

1. If 1 Is added to the greatest 7 - digit number, it will be equal to

(A) 100 thousand (B) 1 lakh (C) 10 lakh (D)1 crore

2. Keeping the place of 6 in the number 6350947 same , the smallest number obtained by rearranging other digits is

(A) 6975430 (B) 6043579 (C) 6034579 (D) 6034759

3. Re-arrange the digits of 1,02,35,007 to get the largest and the smallest number, the difference between the place value of 2 in these two numbers is

(A) 0 (B) 8,000 (C) 20,000 (D) 18,000

4. The largest 4-digit number, using any one digit twice from digits 5,9,2 and 6 is

(A) 9652 (B) 9562 (C) 9659 (D) 9965

5. The largest 5-digit number having three different digits is

(A) 99987 (B) 98978 (C) 99897 (D) 98799

6. Total number of numbers which when rounded off to nearest ten give us 200 is

(A) 9 (B) 10 (C) 8 (D) 7

7. The greatest number which when rounded off to the nearest thousand as 7000 is

(A) 6500 (B) 6549 (C) 7499 (D) 6499

8. The smallest number which when rounded off to the nearest hundred as 600 is

(A) 550 (B) 595 (C) 604 (D) 599

9. How many times does the digit “1” appear in numbers from 1 to 100 ?

(A) 18 (B) 19 (C) 20 (D) 21

10. A, B, C and D are four 4 digit numbers, each having the digit 9 only once and in the place shown. None of the other digits are known

(a) | 9 | | | | **(b)** | | 9 | | | **(c)** | | | 9 | | **(d)** | | | | 9 |

What can be said about A, B, C and D ?

(A) D is the smallest of the four numbers (B) B is larger than C

(C) A is the largest of the 4 numbers (D) D is the largest of the 4 numbers

11. A 7 digit number starts with place in the Indian system.

(A) lakhs (B) ten thousands (C) ten lakhs (D) crores

12. Place value of a digit increases by _____ times as it moves place by place from right to left.

(A) 100 (B) $\frac{1}{10}$ (C) 10 (D) 1000

13. The number of match sticks that can be used to write 39 in roman system are

(A) 8 (B) 9 (C) 3 (D) 6

14. How many five digits numbers are there ?

(A) 99999 (B) 99000 (C) 90000 (D) 98999

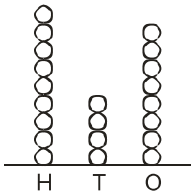
15. The difference between the largest 5-digit number and the largest 5-digit number with three distinct digits is

(A) 10 (B) 10012 (C) 12 (D) 123

16. The difference between the greatest and smallest numbers which when rounded off a number to the nearest tens as 540 , is

(A) 10 (B) 9 (C) 8 (D) 10

17. How many beads should be removed from the hundred's place in the abacus shown here if it has to represent a number between 550 and 650 ?



(A) 4 (B) 3 (C) 2 (D) 1

SECTION -B (TECHIE STUFF)

18. 256002117116223 written according to international system in words as

(A) Two hundred fifty six trillion two billion one hundred seventeen million one hundred sixteen thousand two hundred twenty three

(B) Two hundred fifty six trillion one hundred seventeen million one hundred sixteen thousand two hundred twenty three

(C) Two thousand fifty six trillion two billion one hundred seventeen million one hundred sixteen thousand two hundred twenty three

(D) None of these

19. 100000000000567 written according to international system in words as

(A) One hundred million five hundred sixty seven

(B) One hundred trillion five hundred sixty seven

(C) One hundred five thousand sixty seven

(D) None of these

20. There are four prime numbers written in ascending order. The product of the first three is 385 and that of the last three is 1001, the last number is

(A) 5 (B) 7 (C) 11 (D) 13

21. How many two-digit numbers are there which have different digits in the unit and tens place?

(A) 72 (B) 80 (C) 81 (D) 89

22. The sum of three prime numbers is 100. If one of them exceeds another by 36, then one of the numbers is

(A) 67 (B) 70 (C) 64 (D) None of these

23. On dividing 4150 by certain number, the quotient is 55 and the remainder is 25, the divisor is

(A) 40 (B) 50 (C) 75 (D) 55

EXERCISE 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

1. The diagram shows two numbers **(NSTSE 2009)**

467,285	30,792

Find the product of the place value of digit 6 and place value of digit 9.

(A) 5,400,000 (B) 54,000 (C) 5,400 (D) 54

2. 1 million = _____ lakhs **(NSTSE 2009)**

(A) 1 (B) 10 (C) 16 (D)18

3. Which of the following has the greatest value? **(NSTSE 2009)**

(A) (2 x 100,000) + (6 x 100) (B) (2 x 100,000) + (5 x 1,000)

(C) (3 x 10,000) + (6 x 100) + (7 x 10) (D)(3x 10,000) + (5 x 1,000) + (7x 10)

4. The difference between the largest 8 digit number and the smallest 6 digit number is **(NSTSE 2010)**

(A) 100099999 (B) 99899999 (C) 99989999 (D)99998999

5. Rohan rolled 3 fair number cubes, and the numbers shown below came out on top. If each number is used only once, which group shows all the 3-digit numbers that can be made with these digits? **(IMO 2010)**

4	5	6

(A) 456 565, 654, 544, 655, 645 (B) 456, 546, 654, 645, 556, 664, 555

(C) 456, 465, 564, 654, 546, 444 (D) 456, 465, 564, 546, 645, 654

6. Ms. Neha needs to replace the batteries in 20 calculators. Each calculator uses 4 batteries. The batteries are sold in packages of 16. How many packages of batteries does Ms. Neha need to buy ? **(IMO 2010)**

(A) 64 (B) 4 (C) 80 (D) 5

7. Sneha earns Rs.110 each week taking care of pets. Which of the following is the best estimate of how much money she will earn in 28 weeks while taking care of the pets? **(IMO 2010)**

(A) Rs.1000 (B) Rs. 500 (C) Rs. 9000 (D) Rs. 3080

8. Fill in the blank

1 million =_____hundred thousand. **(IMO 2011)**

(A) One (B) Ten (C) Hundred (D) Twenty

9. Estimate the sum of (21397 + 42505) to nearest thousand. **(IMO 2011)**
(A) 64000 (B) 65490 (C) 70000 (D) 92000

10. Smriti bought 19 boxes of sweets. Each box contains 228 sweets. How many sweets would be left with her after giving 519 sweets to friends? **(IMO 2011)**
(A) 766 (B) 3,813 (C) 4,332 (D) 4,851

11. Which of the given is the largest, when the digits in ten's and one's are interchanged with hundreds and thousands place respectively ? **(NSTSE 2012)**
(A) 8865 (B) 8765 (C) 7865 (D) 7875

12. What is the estimated sum of 21396 , 27808 and 42504 to the nearest ten ?**(NSTSE 2012)**
(A) 91710 (B) 91700 (C) 91720 (D)91730

13. Which of the following rule is not satisfied for Roman numerals? **(NSTSE 2012)**
(A) V,L,D are never subtracted. (B) C can be subtracted from X, M , D and L.
(C) Only I,X,C,M can be repeated. (D) No symbol can be repeated more than 3 times.

14. Neha is getting ready for the state assessment, and is planning mini-lessons for students focused on particular difficulties that they are having with adding columns of numbers. To target her instruction more effectively, she wants to work with groups of students who are making the same kind of error, so she looks at a recent quiz to see what they tend to do. She sees the following three student mistakes.
Which have the same kind of error? **(IMO 2012)**

(I)
$$\begin{array}{r} {\scriptstyle 1\ \ \ } \\ 38 \\ 49 \\ +\ 65 \\ \hline 142 \end{array}$$

(II)
$$\begin{array}{r} {\scriptstyle 1\ \ \ } \\ 45 \\ 37 \\ +\ 29 \\ \hline 101 \end{array}$$

(III)
$$\begin{array}{r} {\scriptstyle 1\ \ \ } \\ 32 \\ 14 \\ +\ 19 \\ \hline 64 \end{array}$$

(A) I and II (B) I and III (C) II and III (D) I, II and III

15. Solve the following Roman numerals.
LIX + XXXVI + IX + XC – LX
(A) CXXXXVI (B) CXXXLIV (C) CXXVII (D) CXXXIV

16. A book of 1,456 pages has 9,95,904 words in it. The number of words in each page is_____. **(IMO 2012)**
(A) 584 (B) 684 (C) 675 (D) 595

17. Match the Roman numerals given in Column-I with their correct Hindu-Arabic numerals given in Column-II. **(IMO 2012)**

Column-I		**Column-II**	
(a)	MDCLXX	(p)	1222
(b)	MMDCCII	(q)	1670
(c)	MCCLXVI	(r)	1266
(d)	MCCXXII	(s)	2702

(A) (a) – (q), (b) – (r), (c) – (s), (d) – (p) (B) (a) – (q), (b) – (s), (c) – (r), (d) – (p)
(C) (a) – (q), (b) – (p), (c) – (s), (d) – (r) (D) (a) – (q), (b) – (s), (c) – (p), (d) – (r)

18. Which of the following numbers when rounded off to the nearest hundred gives 15900? **(IMO 2012)**

(A) 14955 (B) 14999 (C) 15086 (D) 15899

19. What is difference between the smallest 6-digit odd number and the largest 4-digit even number ? **(NSTSE 2013)**

(A) 90002 (B) 90003 (C) 101113 (D)101121

20. What is the value of 108 thousandths multiplied by 15 ones ? **(NSTSE 2013)**

(A) 1.62 (B) 15.108 (C) 108.0 (D)16.20

21. Which one of the following is the best estimation of 5663 × 2234 ? **(NSTSE 2013)**

(A) 5000 × 2000 (B) 5700 × 2200 (C) 5660 × 2230 (D) 5660 × 2330

22. Fill in the blanks:

Every natural number has a _____except _____ and has a_____. **(IMO 2013)**

(A) Successor. 0, predecessor (B) Successor. 1, predecessor

(C) Predecessor. 0, successor (D) Predecessor. 1, successor

23. What is the difference in place value between the digits 8 and 6 in the numeral 8962321? **(IMO 2013)**

(A) 7994000 (B) 7904000 (C) 7960000 (D) 7940000

24. A 29-inch colour TV set costs Rs. 532565 and a 21-inch model costs Rs. 318675. How much more does the bigger TV set cost (In Rs.)? **(IMO 2013)**

(A) Two lakhs thirteen thousand seven hundred and ninety

(B) Two lakhs thirteen thousand eight hundred and ninety

(C) One lakh thirteen thousand nine hundred and ninety

(D) Two lakhs twelve thousand eight hundred and ninety

25. Which of the following statements is INCORRECT? **(IMO 2013)**

(A) The symbol X can be subtracted from L, M and C only.

(B) V , L and D are never repeated.

(C) V , L and D are never subtracted.

(D) I or V is written to the left of L or C.

26. The difference between place values of digit 5 in 456.385 is **(IMO 2014)**

(A) 49995 (B) 499.95 (C) 49.995 (D) 49.999

27. Find the value of CXVI + XIII + VI + CCLXV - XVI **(IMO 2014)**

(A) CD (B) CCCLXXXIV (C) CCCLXXXV (D) M

28. Estimate the following by rounding off each number to nearest hundreds.

78203 - 16407 **(IMO 2014)**

(A) 61700 (B) 62000 (C) 61800 (D) 61500

29. Latika's monthly salary was Rs. 30525. She spent Rs. 1800 and saved the rest. How much did she save in a year? **(IMO 2014)**

(A) Rs. 344700 (B) Rs. 315975 (C) Rs. 248960 (D) Rs.212840

30. Mr. Kapoor left his office at 15:45 to attend a 3-hour seminar in Delhi. He took 2 hours 20 minutes to drive there but was 25 minutes late for the seminar. At what time did the seminar end? **(IMO 2014)**

(A) 21:05 (B) 22:10 (C) 21:30 (D) 20:40

31. Estimate the sum (21497 + 47807) to the nearest thousand. **(IMO 2014)**

(A) 59000 (B) 79000 (C) 69000 (D) 89000

32. The value of XVI + CCCVII = **(IMO 2014)**

(A) CCXXIII (B) CCCXIV (C) CCCXXIII (D) CCCXXV

33. Arrange the following in ascending order. **(IMO 2014)**

P: Eight thousand six hundred fifty two

Q: Ninety six thousand seven hundred forty one

R: Fifty nine thousand nine hundred eighty six

S: Eighty two thousand nine hundred six

(A) P. Q.R.S (B) Q. S. R. P (C) P.R.S.Q (D) P. R.Q.S

ANSWER KEY

EXERCISE 01

SECTION -A (FIXED RESPONSE TYPE)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	B	C	C	C	B	C	C	C	C	B	D	A	C	D	A	D	B	C	D	D
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35					
Ans.	D	D	C	B	C	B	C	B	C	C	C	B	D	D	D					

FILL IN THE BLANKS

1. 1 **2.** 100 **3.** 1023 **4.** 9000 **5.** 600

6. 2000 **7.** 10000 **8.** 6,50,000 **9.** V,L and D **10.** 10

TRUE / FALSE

1. False **2.** True **3.** False **4.** False **5.** True

6. False **7.** False **8.** False **9.** True **10.** False

11. False **12.** True **13.** False

MATCH THE COLUMN

1. (A) - (s) , (B) - (p) , (C) - (q) , (D) - (t) , (E) - (r)

2. (A) - (r) , (B) - (t) , (C) - (p) , (D) - (q) , (E)- (s)

SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1. Predecessor of 7000 =7000 – 1 = 6999

2. 72389 < 72391

3. 2345, 2435, 2543, 3452, 4325

4. Greatest number : 97530
Smallest number : 30579

5. Greatest number : 7760
Smallest number : 6007

6. 300 x 400 = 1,20,000

7. **(a)** 3,000 **(b)** 8,000

8. Total story books sold = 6283
Story books sold by Anuj = 3324
Story books sold by Alok = 6283
– 3324
2959

9. Number of votes the successful candidate registered = 4,67,350
Number of votes the rival secured = 2,18,800
Margin of votes = 4,67,350
-2,18,800
2,48,550
The successful candidate won the election by a margin of 2,48,550 votes.

10. **(a)** 9 **(b)** 65 **11.** **(a)** XII **(b)** XXXIV

SHORT ANSWER TYPE

12. Ascending order - Andhra Pradesh , Bihar , Maharashtra , Uttar Pradesh
Descending order - Uttar Pradesh , Maharashtra , Bihar , Andhra Pradesh

13. Place value of 5 = 500000
Place value of 6 = 60000
Place value of 2 = 200
Place value of 7 = 70
Place value of 1 = 1

14. 594 **15.** 160

16. **(a)** 2,00,000 + 80,000 + 4,000 + 200 + 30 + 1
(b) 50,00,000 + 2,00,000 + 10,000 + 1,000 + 500 + 60 + 8
(c) 6,00,00,000 + 4,00,000 + 10,000 + 8,000 + 500 + 10 + 7
(d) 8,00,00,000 + 90,00,000 +1,00,000 + 80,000 + 1,000 + 200 + 10 +3

17. **(a)** 62,45,635 **(b)** 9, 58, 61, 089

18. three million one hundred ninety-nine thousand two hundred three, two million three hundred eighteen thousand eight hundred twenty-two

19. 50000 Lakh **20.** 300 × 200 = 60000
21. Rough estimate = 450000, Closer estimate = 440000 **22.** 7000 ml

23. Earth, 2100 Km

24. **(a)** 46 = XLVI **(b)** 90 = XC **(c)** 120 = CXX **(d)** 150 = CL

25. **(a)** X X I I = 22 **(b)** C C X = 210 **(c)** D C C = 700 **(d)** L X I I I = 63

LONG ANSWER TYPE

26. **(a)**

Indian System Assamese : 1,30,79,696	International System 13,079,696
Hindi : 33,72,72,114	337,272,114
Konkani : 17,60,607	1,760,607

(b) one crore thirty lakh seventy nine thousand six hundred ninty six
Thirty three crore seventy two lakh seventy two thousand one hundred fourten
Seventeen lakh sixty thousand six hundred seven.

(c) Thirteen million seventy nine thousand six hundred ninty six.
Three hundred thirty seven million two hundred seventy two thousand one hundred fourteen .
One million seven hundred sixty thousand six hundred seven.

27. **(i)** 567 ,576 ,657 ,675 ,756,765 **(ii)** 209 , 290 ,902 ,920

28.
(i) Greatest = 6521 Smallest = 1256
(ii) Greatest = 9870 Smallest = 7089
(iii) Greatest = 6543 Smallest = 3456
(iv) Greatest = 8432 Smallest = 2348
(v) Greatest = 9520 Smallest = 2059
(vi) Greatest = 9631 Smallest = 1369

29.
(i) Greatest = 6632 Smallest = 2236
(ii) Greatest = 6610 Smallest = 1006
(iii) Greatest = 9974 Smallest = 4479
(iv) Greatest = 5520 Smallest = 2005

30.
(i) Greatest = 6987 Smallest = 6012 **(ii)** Greatest = 9487 Smallest = 1402
(iii) Greatest = 9876 Smallest = 1072 **(iv)** Greatest = 9871 Smallest = 2031
(v) Greatest = 9876 Smallest = 9012 **(vi)** Greatest = 9087 Smallest = 1023
(vii) Greatest = 9857 Smallest = 1052 **(viii)** Greatest = 9873 Smallest = 1023

31. 7999003568 **32.** 85041

33. **(a)** 1400 **(b)** 1200 **(c)** 14700 **(d)** 31300

34.
(a) 3228 ≈ 3200 ; 572 ≈ 600 3200 + 600 = 3800
(b) 8010 ≈ 8000 ; 2507 ≈ 3000 8000 – 3000 = 5000
(c) 32 ≈ 30 ; 58 ≈ 60 30 × 60 = 1800
(d) 108 × 47 ; 108 ≈ 100 47 ≈ 50 100 × 50 = 5000

35. 95,70,985 **36.** 9,00,085 **37.** 2,39,805 **38.** 1325 children

39. 142,800,000 **40.** 5890 Lakhs **41.** 4230

42. **(a)** IV = 4 **(b)** III = 3 **(c)** VI = 6 **(d)** XXXIII = 33

43. **(a** XV = 15 **(b)** VIII = 8 **(c)** XVII = 17 **(d)** XVIII = 18
(e) VIII = 8

EXERCISE 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	D	C	D	D	A	B	C	A	D	C	C	C	B	C	C	B	B	A	B	D
Ques.	21	22	23																	
Ans.	C	A	C																	

EXERCISE 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	A	B	B	B	D	D	D	B	A	B	D	A	B	A	D	B	B	D	B	A
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33							
Ans.	C	D	D	B	D	C	B	C	A	D	C	C	C							