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CHAPTER 1

Number System

After completion of this chapter, you should be able to:

- State the difference between digits and numbers:
- Deal with Roman Numbers
- Understand the types of numbers
- Arrange the number both in increasing and decreasing order
- Identify the largest and smallest numbers formed by 5-to-9-digit numbers
- Write numbers in words i.e. Numeration
- Differentiate between Indian number system and international number system.
- Find out Place value and Face value
- Calculate Predecessor and Successor
- Divide the numbers by using divisibility rule

Difference between Digit and Number

Digits

The symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 are known as digits. There are only 10 digits in all. Digits are just like alphabets in English word and with the help of digits, you can make as many numbers as you can. It is same as from alphabet you can make infinite words.

Numbers

The mathematical symbols which represent digits are known as number or numerals. There are uncountable numbers in number system. Numbers are formed with the help of digits and they may be in the form of one digit, two digits, three digit, etc.

Can you help me in differentiating between Numbers and digits?

If yes write here: _____

Roman numerals

- Roman numerals is a numeral system that originated in ancient Rome and remained the usual way of writing numbers throughout Europe well into the Late Middle Ages

- Numbers in this system are represented by combinations of letters from the Latin alphabet

The rules for the system are:

- If a symbol is repeated, its value is added as many times as it occurred i.e., XX is 20, XXX is 30
- A symbol is not repeated more than three times. and the symbols V, L, and D are never repeated
- If a symbol of smaller value is written to the right of a symbol of greater value, its value gets added to the value of greater symbol
  Example:
  VI = 5 + 1= 6
  XII = 10 + 2 = 12
  XXI = 20 + 1 = 21
  LXV = 50 + 10 + 5 = 65

- If a symbol of smaller value is written to the left of a symbol of greater value, its value is subtracted from the value of greater symbol.
  Example:
  IV = 5 - 1 = 4
  IX = 10 - 1 = 9
  XL = 50 - 10 = 40
  XC = 100 – 10 = 90

Tricks to learn:

My	Dear	Cat	Loves	Xtra	Vanilla	Ice - Cream
1000	500	100	50	10	5	1

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

Roman Numerals Chart

1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X

11	XI
12	XII
13	XIII
14	XIV
15	XV
16	XVI
17	XVII
18	XVIII
19	XIX
20	XX

21	XXI
22	XXII
23	XXIII
24	XXIV
25	XXV
26	XXVI
27	XXVII
28	XXVIII
29	XXIX
30	XXX

Types of numbers

1. **Natural Numbers:** The counting numbers are called natural numbers
   Example: N = (1, 2, 3, 4, 5……)

2. **Whole Numbers:** The counting numbers along with zero is called whole number
   Example: W = (0, 1, 2, 3, 4, 5……)

   Interesting Fact All natural numbers are whole number but all whole numbers are not natural number.

3. **Real Numbers:** These numbers includes all the numbers i.e. zero, positive, negative, fractions

4. **Prime Numbers:** A number which only comes into the table of 1 and itself is called a prime number
   Example: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, etc

   Note: 2 is the smallest prime number and only even prime number

5. **Rational Numbers:** The numbers which can be expressed in the form of $\frac{x}{y}$ and x and y are integer but y is not zero are known as rational numbers
   Example: $\frac{2}{5}$, $\frac{3}{4}$

6. **Irrational Numbers:** All the numbers which are not rational are irrational numbers
   Example: $3\sqrt{3}, 3\sqrt{5},$

   Note: $\frac{-3}{0}, \frac{6}{0}$ are neither rational number nor irrational numbers. in $\frac{x}{y}$, if y = 0, the number is not rational and not irrational.

7. **Composite Numbers:** The numbers which have factors other than 1 and itself are known as composite numbers
   Example: 6, 12, 27, 49

8. **Integers:** All the whole number and their negative numbers are known as integers
   Example: I = (…….-3, -2, 1, 0, 1, 2, 3……)

There are of two types of Integers:

   i. **Positive integers:** All natural numbers are positive integers
      Example: 1, 2, 3, 4 ……

ii. **Negative Integers:** All the negatives of natural number are negative integers

Define all type of Number. **Please write it here _____**

Example: -1, -2, -3, -4 ……

Note: Zero is neither positive nor negative integer

Ascending order and descending order

- **Ascending Order:** When numbers are arranged from lowest value to highest value (in increasing order), the numbers are said to be arranged in ascending order
  Example: 5, 11, 25, 111, 3, 72 = 3, 5, 11, 25, 72, 111

  Note: Always check the number of digits to arrange the numbers in ascending order

- **Descending Order:** When the numbers are arranged from highest value to lowest value (in decreasing order), they are called to be arranged in descending order
  Example: 5, 11, 25, 111, 3, 72 = 111, 72, 25, 11, 5, 3

  Note: Always check the number of digits to arrange the numbers in descending order

Forming of largest and smallest number with the help of digits

- **For Largest Number:** We know that 9 is the greatest digit, to form any greatest number we use maximum nine
  Example: Greatest 5-digit number = 99999 (five nines)
  Greatest 6-digit number = 999999(six nines)

Hey Champ; can you tell me greatest nine digit number _____

  To form any greatest number of any digit, always arrange the digits in decreasing order

  Example: from 7, 8, 3, 2, 9, greatest number is 98,732

- **For Smallest Number:** Always remember that 0 is the smallest digit but 0 has no value so we use 1 before zero

  Example: Smallest 5-digit number = 10000
  Smallest 6-digit number = 100000

To form any smallest number, always arrange the digit in increasing order

Example: from 7, 6, 8, 9, 2, 3 2, smallest number is 36,789.

Remember never use zero before any digit as 01000 seems to be 5 digits but actually it has only four digits.

- **Exception case:** Never use 0 in the beginning of any number but you can put zero on the second position of a number

Example: the smallest number from digit 7, 8, 0, 6, 5 = 50687

Write down:

A. Smallest 8-digit number: **C. Smallest 9-digit number:**

B. Greatest 8-digit number: **D. Greatest 9-digit number:**

Numeration

- Writing a number in words is called numeration.
  Example: 101 = One hundred one
  1001 = One thousand one

Types of Numeration

- **Indian system of numeration:**
  - **i.** Ones (O), Tens (T), Hundred (H), Thousand (Th), Ten Thousand (TTh), Lakh (L), Ten Lakh (TL), Crore c) et
  - **ii.** Commas in Indian System of Numeration:

C	TL	L	TTh	Th	H	T	O
5,	4	6,	2	3,	8	5	0

- **International system of numeration:**
  - **i.** Ones, Tens, Hundred, Thousand, Ten Thousand, Hundred Thousand, Million, Ten Million, Hundred Million, Billion, Ten Billion, Hundred Billion, so on
  - **ii.** Commas in International System of Numeration:

TM	M	HTh	TTh	Th	H	T	O
5	4,	6	2	3,	8	5	0

Figure 1: Insertion of Commas

NUMBERS	APPLYING SEPARATORS	IN WORDS
1	1	One
10	10	Ten
100	100	One hundred

1000	**1,000**	**One thousand**
10000	**10,000**	**Ten thousand**
100000	**1,00,000**	**One lakh**
1000000	**10,00,000**	**Ten lakh**
10000000	**1,00,00,000**	**One crore**
100000000	**10,00,00,000**	**Ten crore**
1000000000	**100,00,00,000**	**One hundred crore**

Figure 2: International System of Numeration

PLACE VALUE CHART								
Millions			Thousands			Ones		
Hundred Million	Ten Million	Million	Hundred Thousands	Ten Thousands	Thousands	Hundred	Tens	Ones
7	0	1	0	5	0	0	0	8

Now Let's Learn How to Write a Number in Words

- In Ones period we have (Ones, Tens)
- In Thousands period (Thousand, Ten Thousand)
- In Lakh period (Lakh, Ten Lakh)
- In Crore period (Crore , Ten Crore)

Rule number 1: Don't use plural of words with Hindu numeration like lakhs and Crores.

Example: 3, 45, 67, 845

Wrong numeration: Three crores forty five lakhs sixty seven thousands Eight hundreds forty five
Correct numeration: Three crores forty five lakh sixty seven thousand Eight hundred forty five

Rule number 2: Don't write zero as zero has no place value.

Example: 87, 00, 958
Wrong numeration: Eighty-seven lakh zero thousand nine hundred fifty eight
Correct numeration: Eighty-seven lakh nine hundred fifty eight

Place value and face value

- **Place Value:** Place value is the value of the digit according to its place or position in the number
  Example: Take a number 73
  Place value of 7 is 7 (Tens Place) x 10 =70 and place value of 3 is 3 (Ones Place) x1 =3

- **Face Value:** Face value of a number is the value of digit itself
  Example: Take a number 73

Face value of 3 is 3 and face value of 7 is 7

Predecessor and Successor

- **Predecessor:** Predecessor of a number is one less than of that number
  Example: Predecessor of 121 is 120

- **Successor:** Successor of a number is one more than of that number
  Example: Successor of 121 is 122

Example 1: Write the predecessor and successor of 5,45,656?
Solution: The predecessor of the number is = 545656 – 1 = 545655
The successor of the number is = 545656 + 1 = 545657

Q. Write down the predecessor and successor of 249, 957, 1,00,01, and 5,00,000.

Divisibility rule

Q. What is a divisibility rule?

Answer: A divisibility rule is a shorthand and useful way of determining whether a given number is divisible by a fixed divisor without performing the division, usually by examining its digits.

Divisibility by 2: A number is divisible by 2 if its unit place is either 0 or multiple of 2
Example: 246, 332 and 450 is divisible by 2

Divisibility by 3: A number is divisible by 3 if the sum of digits of that number is a multiple of 3
Example: 24,633 is divisible by 3 (As sum of its digits is 18 which is divisible by 3)

Divisibility by 4: A number is divisible by 4 if the number formed by its last 2 digits is divisible by 4
Example: 328 and 112 is divisible by 4 (1^{st} case: 28 is divisible by 4; 2^{nd} case 12 is divisible by 4)

Divisibility by 5: A number is divisible by 5 if its unit place is 0 or 5
Example: 215 and 110 is divisible by 5

Divisibility by 6: A number is divisible by 6 if it is divisible by 2 and 3 both
Example: 246 is divisible by 6

Divisibility by 8: A number is divisible by 8 if the number formed by the last 3 digits is divisible by 8
Example: 24344 is divisible by 8

Divisibility by 9: A number is divisible by 9 if the sum of its digits is divisible by 9
Example: 6318 is divisible by 9

Divisibility by 10: A number is divisible by 10 if it has a zero in its unit place
Example: 40, 160 is divisible by 10

Divisibility by 11: A number is divisible by 11 if the difference of sum of the digits in the odd places and the sum of the digits in the even places' is a multiple of 11 or zero
Example: 121 is divisible by 11 (odd place digits sum, 1+1 = 2, even place digit sum = 2, difference, 2 – 2 = 0)

Dividend = Divisor × Quotient + Remainder

Example 2: When a number is divided by 5, the quotient is 7 and the remainder is 6. Find the number.

Solution: Divisor = 5
Quotient = 7
Remainder = 6

Dividend = Divisor × Quotient + Remainder
Dividend = 5 × 7 + 6
Dividend = 35 + 6
Dividend = 41
So, the number is 41.

Some important point on Numbers:

- All odd number are not divisible by 2
- All the even numbers are divisible by 2
- All number except prime number are composite numbers
- Prime numbers do not come in any other table (or divisible) except themselves or 1

Approximate value or Rounding off

It is way to find out the closest value of a whole number or a decimal number.
It is done to remove difficulty faced while dealing with the numbers without rounding off.
Example:
12 = 10 (Rounding off figure)
15.1 = 15 (Rounding off figure)
2.74 = 2.70 (Rounding off figure)
5.56 = 5.60 (Rounding off figure)

Common Rules:

- See the last digit of the given number from right hand side.

- In nearest ten, we find the nearest value in counting of 10.
- The approximate value can be found in nearest ten, nearest hundred and nearest tenth (in case of decimal numbers only).
- In case of nearest ten and tenth, when the value of the last digit is less than 5 (in case of last digit is zero, see next digit from right hand side), a smaller value is used. This is called **Lower Approximate Value.**
  Example: 10 for 12, 1.50 for 1.54, 1.80 for 1.83
- In case of nearest ten and tenth, when the value of the last digit is equal to or greater than 5, a higher value is used. This is called **Higher Approximate Value.**
  Example: 20 for 17, 30 for 25, 30 for 26, etc
- In nearest hundred, we find the nearest value in counting of 100.
- In case of nearest hundred, when the value of the last two digits is less than 50, a Lower value is used. This is called **Lower Approximate Value.**
  Example: 200 for 232, 100 for 125, etc
- In case of nearest hundred, when the value of the last two digits is equal to or greater than 50, a higher value is used. This is called **Higher Approximate Value.**
  Example: 200 for 170, 300 for 250, etc
- The order is nearest ten and nearest hundred in cases of numbers.
- The order is nearest tenth, nearest ten, and nearest hundred in cases of decimal numbers.

Example 3: Find out the approximate value of the following in nearest ten:

a) 1249 b) 525 c) 77 d) 102

Solution:

a) 1249

Last digit of the number = 9

Value is equal to or greater than 5

So, Approximate value = 1250

b) 525

Last digit of the number = 5

Value is equal to or greater than 5

So, Approximate value = 530

c) 77

Last digit of the number = 7

Value is equal to or greater than 5

So, Approximate value = 80

d) 102

Last digit of the number = 2

Value is less than 5

So, Approximate value = 100

Example 4: Find out the approximate value of the following in nearest hundred?

a) 1249 b) 525 c) 77 d) 102

Solution

a) 1249

Last two digits of the number = 49

Value is less than 50

So, Approximate value = 1200

b) 525

Last two digits of the number = 25
Value is less than 50
So, Approximate value = 500
c) 77
Last two digits of the number = 77
Value is equal to or greater than 50
So, Approximate value = 100
d) 102
Last two digits of the number = 02
Value is less than 50
So, Approximate value = 100

Example 5: Find out the approximate value of the following in nearest tenth?

a) 1.56 b) 2.29 c) 1.90 d) 5.75

Solution:
a) 1.56
Last digit of the number = 6
Value is equal to or greater than 5
So, Approximate value = 1.60
b) 2.29
Last digit of the number = 9
Value is equal to or greater than 5
So, Approximate value = 2.30
c) 1.90
Last digit of the number = 0
Now, we see the next value
Value of the digit = 9
Value is equal to or greater than 5
So, Approximate value = 2.00

Summary

- The symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 are known as digits. Whereas, the mathematical symbol which represent digits are known as number or numerals.
- Roman numerals are a numeral system that originated in ancient Rome and are represented by combinations of letters from the Latin alphabet.
- Natural numbers, whole numbers, and integers are different types of numbers.
- When the numbers are arranged in increasing order, the number are called to be arranged in ascending order But, when the numbers are arranged in decreasing order, they are called to be arranged in descending order.
- We know that 9 is the greatest digit so to form any greatest number we use maximum nine.
- Always remember that 0 is the smallest digit but 0 has no value so we use 1 before zero.
- Writing a number in words is called numeration. There are two types of numeration: Indian system of numeration and International system of numeration.
- Place value is the value of the digit according to its place or position in the number.
- Face value of a number is the value of digit itself.
- Predecessor of a number is one less than of that number.
- Successor of a number is one more than of that number.
- A divisibility rule is a shorthand and useful way of determining whether a given number is divisible by a fixed divisor without performing the division, usually by examining its digits.

Exercise – 1

Tick (√) the correct option.

1. **The face value of 5 in 3,45,620 is _____?**
   a) 5000 b) 5
   c) 50 d) 500
2. **The greatest 6 digit number is _____?**
   a) 900000 b) 100000
   c) 999999 d) 909090
3. **The only even prime number is _____?**
   a) 2 b) 4
   c) 6 d) 8
4. **The successor of greatest 3 digit number is _____?**
   a) 1000 b) 101
   c) 998 d) 999
5. **Seventy six lakh four thousand eighty three is written as _____ in international number system.**
   (AISSEE–2022)
   a) 7,640,083 b) 76,483
   c) 760,483 d) 7,604,083
6. **The difference between face value and place value of 3 in 2,10,319 is _____?**
   a) 2997 b) 316
   c) 322 d) 297
7. **The digit whose place value remains always fixed is _____?**
   a) 0 b) 1
   c) 2 d) 5
8. **One crore is equal to:**
   a) One million b) ten million
   c) hundred million d) None of these
9. **2,00,000 + 6,000 + 800 + 6 is equal to:**
   a) 2,06,806 b) 2,05,086
   c) 2,06,800 d) 12,06,806
10. **-5 is an**
    a) Integer
    b) Whole number
    c) Natural number
    d) Even number

Exercise - 2

Tick (√) the correct option

1. **When 8,12,536 is rounded off to the nearest thousands, we get _____?**
   a) 8,13,000 b) 8,12,500
   c) 8,12,000 d) None of these
2. **I am a five-digit even number. I have 9 at my tens place. The digit at the ten thousands place is three less than the digit at the tens place. The digit at hundreds place is half the value of the digit at the ten thousand place. The digit at the thousand place is double the digit at the ones place. Who am I?**
   (AISSEE – 2022)
   a) 68494 b) 61392
   c) 64391 d) 68394
3. **The smallest digit which can replace * to make 201*58 divisible by 3 is _____?**
   a) 1 b) 2
   c) 3 d) 4
4. **Match the following (I-IV to i-iv):**
   (I) Odd number + Even number
   (II) Even number + Even number
   (III) Even number
   (IV) Prime number

   (i) 16250
   (ii) 17
   (iii) Odd number
   (iv) Even number
   a) (I)-(iii), (II)-(iv), (III)-(i), (IV)-(ii)
   b) (I)-(ii), (II)-(i), (III)-(iv), (IV)-(iii)
   c) (I)-(iv), (II)-(i), (III)-(ii), (IV)-(iii)
   d) (I)-(ii), (II)-(iv), (III)-(i), (IV)-(iii)
5. **Sum of smallest prime number and smallest composite number is**
   a) 6 b) 16
   c) 5 d) 15
6. **100 lakhs = _____ millions.**

a) 1 b) 10
c) 100 d) 1000

7. **Which of the following is meaningless?**
a) IXI b) XL
c) XV d) LIV

8. **What is the difference of sucessor and predessor of largest 5 digit number?**
a) 1 b) 2
c) 3 d) 4

9. **Find the smallest 4 digit number from digits 2, 0, 7, 9?**
a) 0279 b) 2079
c) 9720 d) 7920

10. **Which of the following is a composite number?**
a) 13 b) 57
c) 43 d) 97

Exercise –3

Tick ($\surd$) the correct option

1. **Solve the following**
MMDCLXI - CDXLV
a) MMXVI b) MMCCXVI
c) MCXV d) CCCXVI

2. **Match the following**

Column I	**Column II**
(I) 4624	**(i) divisible by 3**
(II) 4374	**(ii) divisible by 9**
(III) 1230	**(iii) divisible by 4**
(IV) 4257	**(iv) divisible by 9**

a) (I)-(iii), (II)-(ii), (III)-(i), (IV)-(iv)
b) (I)-(ii), (II)-(iii), (III)-(iv), (IV)-(i)
c) (I)-(iii), (II)-(i), (III)-(iv), (IV)-(ii)
d) (I)-(iv), (II)-(i), (III)-(ii), (IV)-(iii)

3. **Which statement/statements are not true.**
i) 0 is a positive integer
ii) 1 is the smallest prime number
iii) 2 is smallest prime number
iv) Sum of two odd number is even
a) Both a and b b) Both a and c
c) All are false d) Only a

4. **The product of 10101 × 25 is _____?**
(AISSEE – 2018)
a) 252725 b) 252525
c) 25025025 d) 272725

5. **Match the following:**

(I) XLVI	**(i) 99**
(II) MDCXLIV	**(ii) 1999**
(III) MCMXCIX	**(iii) 1644**
(IV) XCIX	**(iv) 46**

a) (I)-(ii), (II)-(iii), (III)-(iv), (IV)-(i)
b) (I)-(ii), (II)-(i), (III)-(iv), (IV)-(iii)
c) (I)-(iv), (II)-(iii), (III)-(ii), (IV)-(i)
d) (I)-(iv), (II)-(i), (III)-(ii), (IV)-(iii)

6. **In a school there are CMXLIV. If there are DCCXL boys find number of girls?**
a) CXIV b) CCXIV
c) DCXI d) CCIV

7. **145 x 125 = 145 x m + 145 x n now possible value of m and n are**
a) m = 100, n = 45
b) m = 25, n = 45
c) m = 100, n = 25
d) m = 75, n = 125

8. **Rounding off 7348561 to the nearest hundreds is _____?**
(AISSEE – 2022)
a) 7348000 b) 7348600
c) 7348560 d) 7348500

9. **CXXIV + XCIX = _____?**
a) CCXLVII b) CXCV
c) XCX d) CCXXIII

10. **1925 x 1725 x 1620 = m x 1925 x 1725. Find value of m**
a) 1725 b) 1620
c) 1925 d) 1000

Exercise –4

Tick (√) the correct option

1. **Find the sum of first 15 prime number**
   a) 327 b) 328
   c) 329 d) 400
2. **Whole numbers are closed under (AISSEE – 2022)**
   a) Multiplication b) Addition
   c) Division d) Both (a) and (b)
3. **Which of the following pairs are twin prime number?**
   a) (2, 3) b) (3, 5)
   c) (5, 9) d) (7, 9)
4. **Which of the following number is divisible by 4?**
   a) 12350 b) 12364
   c) 12782 d) 11935
5. **124x is divisible by 6. Find the minimum value of x?**
   a) 1 b) 2
   c) 3 d) 6
6. **Find the greatest 4-digit number divisible by 12?**
   a) 9998 b) 9996
   c) 9995 d) 9994
7. **Find the least 4-digit number divisible by 13?**
   a) 1000 b) 1001
   c) 1002 d) 1003
8. **Find the largest 4-digit number divisible by 15?**
   a) 9993 b) 9995
   c) 9999 d) 9990
9. **Which is the least number of 5 digit divisible by 22?**
   a) 10000 b) 10010
   c) 10020 d) 10001
10. **Even number + Even number + odd number = _____**
    a) Odd number b) Even number
    c) Prime number d) Composite number

Exercise– 5

Tick (√) the correct option

1. **Match the following (I-IV to i-iv):**
   I) Commutative property
   II) Associative property
   III) Distributive property
   IV) Closure property

   i) Natural number + Natural number = Natural number
   ii) a x (b + c) = a x b + a x c
   iii) (a x b) x c = a x (b x c)
   iv) (a + b) = (b + c)

   a) I – iv, II – iii, III – ii, IV – i
   b) I – iv, II – i, III – ii, IV – iii
   c) I – ii, II – iii, III – iv, IV – i
   d) I – iii, II – iv, III – ii, IV – i
2. **Which of the following is true?**
   a) Zero is a positive integer
   b) -7 is a whole number
   c) 2 is a composite number
   d) Sum of two prime number is not always prime
3. **Multiply: 16 x 0**
   a) 0 b) 18
   c) 16 d) 25
4. **Find the sum of largest and smallest five-digit number from digits 2, 7, 5, 0?**
   a) 97577 b) 59777
   c) 97775 d) 97757
5. **MDCXLVI + DCXLV – XCIX?**
   a) MMCXCII b) MCDXL
   c) MXLIV d) XLIX
6. **If a number is divisible by 45 then?**

a) It should be divisible by 5
b) It should be divisible by 9
c) It should be divisible by both 9 and 5
d) It should not be divisible by both 9 and 5

7. 180 x (m + n) = 180 x 170 + 180 x 30, then find the value of m + n?

a) 100 b) 200
c) 140 d) 160

8. Match the following?

Roman symbol	**Value**
I) M	**i) 50**
II) D	**ii) 500**
III) C	**iii) 100**
IV) L	**iv) 1000**

a) I – iv, II – ii, III – iii, IV - i
b) I – ii, II – iv, III – iii, IV - i
c) I – iv, II – iii, III – ii, IV - i
d) I – i, II – ii, III – iii, IV - iv

9. Which of the following is/are true?

I) Natural number x 0 = 0
II) Natural number + 0 = 0
III) Natural number ÷ 0 = Infinity
IV) Natural number – 0 = 0

a) I, II and III only b) I and III only
c) I and IV only d) IV only

10. If 12xy is divisible by 20 fixed the minimum value of x + y?

a) 11 b) 2
c) 5 d) 6

Answer Key – 1

1. Answer: (b)
Explanation: The face value of 5 in 3,45,620 is 5. Face value of any number is the number itself.

2. Answer: (c)
Explanation: To find the greatest number of n digits $[where\ n = 1,2,3 - - - -\infty]$
We repeat 9 n times
Largest 2 digit = 99
Largest 3 digit = 999
Largest 4 digit = 9999
Largest 5 digit = 99999
Largest 6 digit = 999999

3. Answer: (a)
Explanation: 2 is the only even prime number similarly 3 is smallest odd prime number.

4. Answer: (a)
Explanation: Largest 3-digit number is 999 if 1 is added 999 + 1 =1000.

5. Answer: (d)
Explanation: In Indian number system = 76,04,083
In International number system = 7,604,083

6. Answer: (d)
Explanation: Face value of 3 in 2,10,319 is 3
Place value of 3 in 2,10,319 is 300
Difference is 300 – 3 = 297

7. Answer: (a)
Explanation: 0 doesn't have any place value.

8. Answer: (b)
Explanation: Comparing Indian number system and International number system

Indian	Crore	Ten Lakh	Lakh	Ten Thousand	Thousand	Hundred	Tens	Ones
International	Ten Million	Million	Hundred Thousand	Ten Thousand	Thousand	Hundred	Tens	Ones

9. Answer: (a)
Explanation: 2,00,000 + 6,000 + 800 + 6 = 2,06,806

10. Answer: (a)
Explanation: Integer- There are three types of Integers
a) Positive- All counting numbers.
b) Negative- All the negatives of counting number.
c) Zero- It is neither positive nor negative.

Answer Key – 2

1. Answer: (a)
Explanation: For nearest 1000
We will take 500 as base here 536 is greater than 500.
So, we will round it to nearest 1000 i.e.,8,13,000.

2. Answer: (d)
Explanation: There are 5-digit number in each option now from options.
Option a, b, c, d all have 9 in tens place.
Now, digit at ten thousand place is three less so digit at ten thousand places should be 6 and we can see every option follows it. The digit at hundred place is half of ten thousand.
Now, half of 6 is 3.
Which eliminates option a.
The digit at the thousand place is double. The digit at unit place only option d agrees so correct answer is d.

3. Answer: (b)
Explanation: 2 + 0 + 1 + * + 5 + 8 is divisible by 3
16 +* is divisible by 3
16 + 1 = 17 is not divisible by 3
16 + 2 = 18 is divisible by 3
16 + 3 = 19 is not divisible by 3
16 + 4 = 20 is not divisible by 3

4. Answer: (a)

5. Answer: (a)
Explanation: Smallest prime number = 2

Smallest composite number = 4
2 + 4 = 6

6. Answer: (b)
Explanation:

Crore	Ten Lakh	Lakh	Ten Thousand	Thousand	Hundred	Tens	Ones
Ten million	Million	Hundred Thousand	Ten Thousand	Thousand	Hundred	Tens	Ones

100 lakh = 1 crore = 10 million.

7. Answer: (a)

Explanation: IXI is meaning less
XL = 40
XV = 15
LIV = 54

8. Answer: (b)
Explanation: Largest 5-digit number is 9999
Successor of 9999 + 1 = 10000
Predecessor of 9999 – 1 = 9998
10000 – 9998 = 2

9. Answer: (b)

10. Answer: (b)
Explanation: 57 is divisible by 3 rest all are prime.

Answer Key – 3

1. Answer: (b)
Explanation: MMDCLXI
1000 +1000 + 500 + 100 + 50 + 10 + 1
= 2661
CDXLV
100 + 500 - 10 + 50 + 5
= 445
Difference = 2661 – 445
= 2216 = MMCCXVI

2. Answer: (a)
Explanation: (I) 4624 is divisible by 4 as divisibility of 4 says last 2 digit are divisible by 4.
(II) 4 + 3 + 7 + 4 = 18
18 is divisible by 9.
So, 4374 is divisible by 9.
(III) 1230 = 1 + 2 + 3 + 0
= 6 is divisible by 3.
(IV) 4257
4 + 5 = 9
2 + 7 = 9
9 – 9 = 0
Hence, 4257 is divisible by 9.

3. Answer: (a)
Explanation: (i) 0 is neither positive nor negative.
(ii) 2 is smallest prime number.
(iii) and (iv) are both correct.

4. Answer: (b)
Explanation: 10101 x 25 on multiplying
= 252525

5. Answer: (c)

6. Answer: (b)
Explanation: Total number of students,
CMXLIV = 944
Total number of boys,
DCCXL = 740
Number of girls = 944 – 740 = 204
204 = CCIV

7. Answer: (c)
Explanation: 145 x 125 = 145 x m + 145 x n
145 x 125 = 145 (m + n)
m + n = 125
from options only c has 100 + 25 = 125.

8. Answer: (b)
Explanation: 7348561
For nearest hundred base number is 50.
Now, 61 is greater than 50.
So, 7348600.

9. Answer: (d)
Explanation: CXXIV + XCIX
124 + 99
= 223

Now 223 is CCXXIII.

10. Answer: (b)

Explanation: Now according to associative property.
1925 x 1725 x 1620 = m x 1925 x 1725
m = 1620

Answer Key – 4

1. Answer: (b)
Explanation: First 15 prime number are – 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 + 41 + 43 + 47 = 328

2. Answer: (d)
Explanation: Multiplication: Whole number are closed under multiplication
Whole x whole = Whole number
4 x 0 = 0 and 4 x 5 = 20
Addition: Whole numbers are closed under addition
4 + 0 = 4 and 5 + 5 = 10
Whole number + Whole number = Whole number

3. Answer: (b)
Explanation: For being twin prime number, the difference between the prime number should be 2.

4. Answer: (b)
Explanation: 12364 is divisible by 4.
So, last two-digit number are divisible by 4. So, 12364 is divisible by 4.

5. Answer: (b)
Explanation: 1 + 2 + 4 + x
Put the value of x
1 + 2 + 4 + 2 = 9
9 is divisible by 3 and 1242 is divisible by 2
Hence number is divisible by 6.

6. Answer: (b)
Explanation: Greatest 4-digit number is 9999.

	833
12	9999 96
	39 36
	39 36
	3

9999 - 3
9996 is the greatest 4-digit number divisible by 12.

7. Answer: (b)
Explanation: Least 4-digit number = 1000

	76
13	1000 91
	90 78
	12

Now we require 13 – 12 = 1 to be added
1001 is the least number of 4 digit divisible by 13.

8. Answer: (d)
Explanation: Largest 4-digit number = 9999

	666
15	9999 90
	99 90
	99 90
	9

So, 9999 – 9 = 9990
9990 is the largest number of 4 digit divisible by 15.

9. Answer: (b)
Explanation: Least 5-digit number = 10000

	454
22	10000 88
	120 110
	100 88
	12

So, 10000 + (22-12) = 10000 + 10
10010 is the largest number of 4 digit divisible by 15.

10. Answer: (a)
Explanation: Even number + Even number = Even number
Even number + Odd number = Odd number

Answer Key - 5

1. Answer: (a)

2. Answer: (d)

3. Answer: (a)
Explanation: Any number multiply by 0 is 0.

4. Answer: (a)
Explanation: Largest 5-digit number = 77520
Smallest 5-digit number = 20057
Sum of numbers = 77520 + 20057
= 97577

5. Answer: (a)
Explanation: MDCXLVI = 1000 + 500 + 100 + 40 + 6
= 1646
DCXLV = 500 + 100 + 40 + 5 = 645
XCIX = 99
So, 1646 + 645 – 99 = 2192
2192 = MMCXCII

6. Answer: (c)

Explanation: If a number is divisible by any other number, then all the factors of other number are also divisible by that number.

7. Answer: (b)
Explanation: 180 x 170 + 180 x 30
180 x (170 + 30)
180 x 200
200
So, m + n = 200.

8. Answer: (a)

9. Answer: (b)

10. Answer: (b)
Explanation: If 12xy is divisible by 20
Then y = 0
12x0, now for x minimum possible value 2
Now x + y = 2 + 0 = 2.