GENERAL APTITUDE

Trainer : Sujata Mohite

Email:sujata.mohite@sunbeaminfo.com

Aptitude

C-CAT Distribution-

A. Quantitative/ Maths /Algebra – 23-25 Questions

B. Reasoning - 13-15 Questions

C. English – 10-12 Questions

Aptitude

- Key to success

    - A. Problem Recognition

    - B. Speed

    - C. Practice

Aptitude – Important Topics

A. Quantitative-

     - Average

     -Percentage

     -Profit & Loss

     -time & Work

     -Speed, time & distance

B. Reasoning -

     - Seating Arrangement

     - Blood Relations

     - Analogy

     - Coding-Decoding

Aptitude – Important Topics

C. English –

- Articles

- Passive and Active voice

- Prepositions

- Synonyms
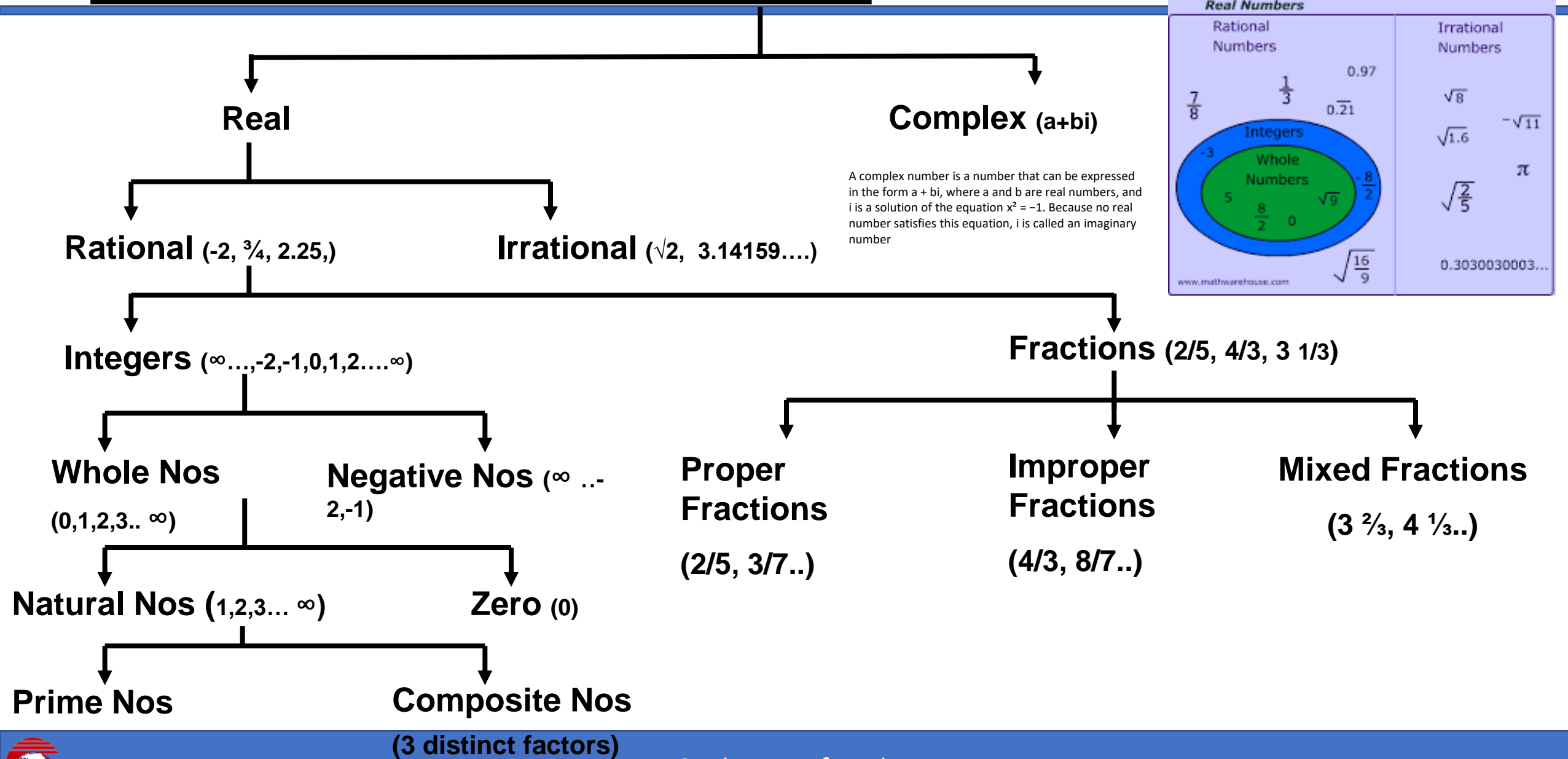
- Antonyms

- Idioms and Phrases

BASIC MATHS

- Tables at least from 1-20
- Squares from 1-25
- Prime numbers from 1-100
- Divisibility rules for 1-20
- Methods for typical multiplications & divisions
- Methods for finding HCF & LCM
- Methods for finding squares & square roots

Numbers

Real

Complex (a+bi)

A complex number is a number that can be expressed in the form a + bi, where a and b are real numbers, and i is a solution of the equation $x^2 = -1$. Because no real number satisfies this equation, i is called an imaginary number

Rational (-2, ¾, 2.25,)

Irrational (√2, 3.14159….)

Integers (∞…,-2,-1,0,1,2….∞)

Fractions (2/5, 4/3, 3 1/3)

Whole Nos

(0,1,2,3.. ∞)

Negative Nos (∞ ..-2,-1)

Proper Fractions

(2/5, 3/7..)

Improper Fractions

(4/3, 8/7..)

Mixed Fractions

(3 ⅔, 4 ⅓..)

Natural Nos (1,2,3... ∞)

Zero (0)

Prime Nos

Composite Nos

(3 distinct factors)

Basic Mathematical Operations

- **BODMAS**
- B   - Bracket   ( ) , { }, [ ]
- O   - Order
- D   - Division
- M   - Multiplication
- A   - Addition
- S   - Subtraction.

Basic Number Representation

- Place Value : Units, Tens, Hundreds, ….
- Value of a 2 digit no. 'ab' where both a & b are natural numbers = 10(a) + b
- The number with reversed digits will be 'ba' & the value of the number

     will be = 10(b) + a

- Maximum sum of two digits can be 18 (9+9)

Numbers

Q. A number consists of two digits. Sum of the digits is 9. If 63 is subtracted from the number its digits are interchanged. Find the number.

A. 72   B. 90   C. 63   D. 81

Solution :

Let the tens digit be a & units digit be b

$a + b = 9$ ……………(1)

$10a + b - 63 = 10b + a$

$9a - 9b = 63$ ……………(2)

(1)x9

$9a + 9b = 81$ ....……...(3)

(2) + (3)

$18a = 144 \rightarrow a = 8 , b = 1$

Number = 81

Ans D

ADDITION

- SUM of 2 EVEN numbers is EVEN   : 2 + 6=8
- SUM of 2 ODD numbers is EVEN   : 7 +17=24
- SUM of ODD & EVEN numbers is ODD   : 13 + 8=21

SUM OF NATURAL NUMBERS

- **Rule 1 :** Sum of first n natural numbers = $\dfrac{n(n+1)}{2}$

  e.g. sum of 1 to 74 = 74 x (74+1)/2 = 2775.

- **Rule 2 :** Sum of first n odd numbers = n^2

  e.g. sum of first seven odd numbers

  = (1+3+5+7+9+11+13) = 49 = 7^2.

- **Rule 3** : Sum of first n even numbers = n **(n+1)** .

  e.g. sum of first 9 even numbers

  = (2+4+6+8+10+12+14+16+18) = 90

  = 9 (9+1) = 9 x10 = 90

SUM OF NATURAL NUMBERS

- **Rule 4 :** Sum of squares of first n natural numbers = $\dfrac{n(n+1)(2n+1)}{6}$

  e.g. sum of squares of first 8 natural numbers

  = (1 + 4 + 9 + 16 + 25 + 36 + 49 + 64) = 204

  = 8 (8+1)(16+1)/ 6 = 8 x 9 x 17 / 6 = 204

- **Rule 5 :** Sum of cubes of first n natural numbers = $[n(n+1)/2]^2$

  e.g. sum of cubes of first 4 natural numbers

  = (1 + 8 + 27 + 64) = 100

  = $[4 (4+1)/2]^2$ = 100

SUBTRACTION

- DIFF of 2 EVEN numbers is EVEN   : 6 – 2 = 4
- DIFF of 2 ODD numbers is EVEN   : 17 – 7 = 10
- DIFF of ODD & EVEN numbers is ODD   : 13 – 8 = 5

Numbers

Q2. If n and k are even integers, which of the following is an even integer?

A. n + k + 1
B. (n - 1) (k + 1)
C. 2(n+k+1)
D. (n - 3) (k + 1)

Solution:-

Opt A Even + Even = Even + 1 = Odd

Opt B Even-1 = Odd Even+1 = Odd   Odd x Odd = Odd

Opt C Even + Even = Even +1 =Odd x 2 = Even.

Ans C

MULTIPLICATION

- PRODUCT of 2 EVEN numbers is EVEN   : 6x8=48
- PRODUCT of 2 ODD numbers is ODD   : 3x17=51
- PRODUCT of ODD & EVEN numbers is EVEN: 3x6=18

MULTIPLICATION

1. To multiply by 9, 99, 999….

Place as many zeroes to the right of multiplicand as there are 9s and subtract the multiplicand itself.

e.g. 26234 x 999 = ?

        26234000

  -     26234

    26207766

Multiples

- Multiples of number are obtained by multiplying that number by natural numbers.

e.g. Multiples of 3 are 3, 6, 9, 12, ……

If we want to find no of multiples of 6 less than 255

255 / 6 = 42 (remainder 3) So there are 42 such multiples.

DIVISION

- DIVISION of ODD number by ODD is ODD : 21 ÷ 3 = 7
- DIVISION of EVEN number by ODD is EVEN: 24 ÷ 3 = 8
- DIVISION of EVEN number by EVEN is ODD/EVEN

  :12 ÷ 4 = 3, 12 ÷ 6 = 2

- DIVISION of ODD number by EVEN is NOT POSSIBLE

- If two numbers are divisible by a number then their sum & difference is also divisible by the number.
- E.g. For 63 is divisible by 9. 27 is also divisible by 9.
- So 63 + 27 = 90 is also divisible by 9
- And 63 – 27 = 36 is also divisible by 9

DIVISIBILITY RULES

- 2 :   Unit place is even or zero(last digit should be divisible by 2)

- 3 :   Sum of the digits is divisible by 3. e.g : 324

- 4 :   Last 2 digits are divisible by 4 or last 2 digits are 0. e.g : 324

- 5 :   Unit digit is 5 or 0

- **6 :   Divisible by co primes 2 & 3.** e.g : 324

- 8 :   Number formed by last 3 digits is divisible by 8 or last 3 digits are 0. e.g : 1088

- 9 :   Sum of all digits is divisible by 9. e.g : 324

- 10:   Units digit is 0.

- 11 : Difference between sum of digits in odd & even places should either be zero or divisible by 11

e.g: 8283

e.g : 918071

DIVISIBILITY RULES

- **12 : Divisible by co primes 3 & 4** e.g : 324

- **14 : Divisible by co primes 2 & 7**

- **15** : **Divisible by co primes 3 & 5**

- **16 :** No formed by last 4 digits divisible by 16/ last 4 digits 0.

- **18 : Divisible by co primes 2 & 9**

- 20 : Units digit 0 & tens digit is even.

DIVISIBILITY RULES

- **7 : The difference between the two alternate groups taking 3 digits at a time should either be zero or multiple of 7.**
  - **- 550500006**
  - **- 7370356**

- **13 : The difference between the two alternate groups taking 3 digits at a time should either be zero or multiple of 13.**
  - **- 200174**

PROPERTIES OF DIVISIBILITY

- **To find a number completely divisible by another :**

  A) **Greatest 'n' digit number exactly divisible by a Number :**

  Method : By subtracting the remainder

  e.g a) Greatest 3 digit number divisible by 13

        Greatest 3 digit number = 999.   999/13 gives remainder 11.

        999-11 = 988 = Greatest 3 digit number divisible by 13

  B) **Least 'n' digit number exactly divisible by a Number :**

  Method : By adding the (divisor – remainder)

        b) Least 3 digit number divisible by 13

        Least 3 digit number = 100.   100/13 gives remainder 9

        100 + (13 – 9) = 104 = Least 3 digit number divisible by 13

Divisibility

Q. A number 344ab5 is divisible by both 9 & 25. Given that a+b < 8 find the number

A. 344125   B. 344525   C. 344925   D. 344025

Solution :

The number is divisible by 5, the unit digit of the number = 0 or 5

Number is divisible by 9. So (16+a+b) is divisible by 9.

So (a+b) is either 2 or 11.   But given a+b < 8

So (a+b) = 2 So (a,b) may be (0,2) or (1,1) or (2,0)……..(1)

Number is divisible by 25. So b is 2 or 7 ………………(2)

From (1) & (2)   b = 2 & a = 0

So number is 344025.

Ans : D

PRIME NUMBERS

- A number that is divisible only by itself and 1 (e.g. 2, 3, 5, 7, 11).

- There are 25 prime numbers between 1 - 100

- 1 is neither prime nor composite number.

- 2 is the only prime number which is even.

- A number having more than 2 factors is a composite number

- Find prime numbers between 101 and 200??

- There are 21 prime numbers between 101 - 200

Co-prime

- When two numbers (they may not be prime) do not have any common factor other than one between them they are called co-prime or relatively prime.

- It is obvious that two prime numbers are always co-prime. e.g : 17 and 23

- Two composite numbers can also be co-prime. e.g: 16 & 25 do not have any common factor other than one.

- Similarly 84 and 65 do not have any common factor and hence are co-prime.

Prime Number

Q. Find whether 467 is prime or not

Step 1 : Sq root of 467→ Between 21 (441) and 22 (484)

Step 2 : 467 is not divisible by 2, 3, 5, 7, 11, 13, 17, 19. Next prime is 23 which exceeds the square limit.

Therefore 467 is prime.

Numbers(Assignment)

Which of the following is the output of 57 x 57 + 43 x 43 + 2 x 57 x 43 ?

A. 10000   B. 5700   C. 4300   D. 1000

Ans : A

Numbers(Assignment)

Q. Which of the following is the output of 6894 x 99 ?

A. 685506   B. 682506   C. 683506   D. 684506

Ans: B

Numbers(Assignment)

Q. What is the unit digit in 584 x 428 x 667 x 213 ?

A. 2   B. 3   C. 4   D. 5

Ans: A

THANK YOU