

# Aptitude & Reasoning

**Gate Notes**

### Test of Reasoning:- (20 M)

#### Verbal test of Reasoning :-

- 1. Number
- 2. Time sequence
- 3. Ranking and comparison
- 4. Blood relations
- 5. Arithmatical reasoning
- 6. Logical venn diagrams
- 7. Alphabetical test
- 8. Mathematical operations
- 9. Coding and Decoding
- 10. Inserting the missing character (Number series)
- 11. Alphabetic Qubal.
- 12. Direction and distances
- 13. Number, Time, sequence,

#### Non verbal test of Reasoning:-

- 1. Cubes and dices
- 2. Analytical figures

#### Computations:- (10 M)

- 1. Ratios and proportions
- 2. partnership
- 3. problems on Ages
- 4. Time and work
- 5. Types and cisterns
- 6. Averages
- 7. Time, distance and speed
- 8. Mixtures and Allegations
- 9. percentages
- 10. Profit and loss
- 11. Interest calculations
- 12. problems on clocks
- 13. Calenders
- 14. Data Interpretation

Left  $\Rightarrow \Rightarrow$  (L) to (R)

Right

From left = To Right = Towards Right

From your left = To your Right = Towards your Right.

(L)  $\Leftarrow \Leftarrow$  (R)

(L) From Right = To left = Towards left

From your Right = To your left = Towards your left

Alphabetical Qubble :-

Qubble means "play with"

G T<sub>20</sub> = Twenty

F = 6  
Fix = six

(R)

|     |    |   |   |   |   |   |    |   |   |   |   |   |   |    |               |     |
|-----|----|---|---|---|---|---|----|---|---|---|---|---|---|----|---------------|-----|
| (L) | A  | B | C | D | E | F | 6  | 7 | G | H | I | J | K | L  | M             | (R) |
|     | N  | O | P | Q | R | S | T  | U | V | W | X | Y | Z | 26 |               |     |
| 14  | 15 |   |   |   |   |   | 20 |   |   |   |   |   |   |    | (second half) |     |

Ex:-) Which letter will be fourth to the right of 12<sup>th</sup> position from your left end of the english alphabet.

Ans) 'P'  $\frac{\text{to}}{4R} + \frac{\text{from}}{12L} = 16L$

Ex:-) Which letter will be fifth to the left of 9<sup>th</sup> letter from your right end of the english alphabet.

A) 'M'  $\frac{\text{to}}{5L} + \frac{\text{from}}{9R} = 14R$

Ex:-) Which letter will be sixth to the left of 20<sup>th</sup> position from your left hand of English alphabet.

Ans) 'N'  $\frac{\text{to}}{6L} - \frac{\text{from}}{20L} = 14L$

Ex:-) Which letter will be 5<sup>th</sup> to the right of 20<sup>th</sup> position from your right end of the English alphabet. (2)

A) To      from  
 $5R - 20R = 15R$       L

Note:-

- 1. Like in above type of problems if in to and from position
  - a. If both are same directions (subtract them) (-)
  - b. If both are different directions (Add them) (+)

|           |             |
|-----------|-------------|
| <u>To</u> | <u>From</u> |
| L         | + R         |
| R         | + L         |

Ex:- Which letter will be 12<sup>th</sup> to the left of 30<sup>th</sup> position from your left end of the English alphabet.

A) To      From  
 $12L - 30L = 18L$       "R"

Type-II questions:-

Ex:- If in the English alphabet interchange 'A' takes the 'Z', and 'Z' takes place of 'A', 'B' takes 'Y', 'Y' takes 'B' which letter will be 6<sup>th</sup> to the right of 10<sup>th</sup> position from your left end.

Ans:-) to      from  
 $6R + 10L = 16L$       "P"

Ex:- If in the English alphabets interchange their positions i.e.) A' takes place of 'Z', 'Z' takes 'A', 'B' takes 'Y', 'Y' takes 'B' and so on. which letter will be 5<sup>th</sup> to the right of 12<sup>th</sup> position from your left end.

Ans) to      from  
 ...      ...      "J"      so on, (~~given~~ given so alphabets interchanged)

Note:-

Like in above type of problems if total alphabets written in reverse order then obtain direction is reverse i.e.,

$$L \rightarrow R, R \rightarrow L$$

Ex:- In above problem which letter will be 6<sup>th</sup> to the right of 22<sup>nd</sup> position from your right end.

Ans:-  $\frac{\text{to}}{6R} - \frac{\text{from}}{22R} = 16 \underset{R}{\cancel{R}} \rightarrow 16 \underset{L}{\cancel{L}} \Rightarrow \underline{P}$

Type-III Questions:-

Ex:- If in the English alphabets interchange their position i.e., 'A' takes 'B', 'B' takes 'A', 'C' takes 'D', 'D' takes 'C' and so on... which letter will be 6<sup>th</sup> to the right of 11<sup>th</sup> letter from your left end.

A)  $\begin{array}{ccccccccccccccccc} \textcircled{L} & \text{B} & \text{A} & \text{D} & \text{C} & \text{F} & \text{E} & \text{H} & \text{G} & \text{J} & \text{I} & \text{L} & \text{K} & \text{N} \\ \text{M} & \text{P} & \text{O} & \text{R} & \text{Q} & \text{T} & \text{S} & \text{V} & \text{U} & \text{X} & \text{W} & \text{Z} & \text{Y} & \text{R} \end{array}$

$$\frac{\text{to}}{6R} + \frac{\text{from}}{11L} = 17L \quad \underline{\underline{R}}$$

(or)

$$6R + 11L = 17L \quad (\text{add } + 1) \Rightarrow \frac{17L+1}{\downarrow \text{odd}} = 18L \quad (\text{original alphabet}) \Rightarrow \underline{\underline{R}}$$

Note:-

Like in above type of problems if adjacent (or) interchange their positions then apply odd even principle.

$$\text{odd} = +1$$

$$\text{even} = -1$$

Ex:-) In above problem which letter will be 5<sup>th</sup> to the right of 25<sup>th</sup> position from your right end.

(3)

Ans) To    From

$$SR - 25R = 20R \text{ (even then subtract '1')}$$

$$= 20R - 1 \Rightarrow 19R \Rightarrow \underline{\text{H}}$$

Ex:-) If in the English alphabets all adjacent positions ~~are~~ <sup>or</sup> interchange their places and also total sequence is written in reverse order then which letter will be 6<sup>th</sup> to the left of 13<sup>th</sup> position from your right end.

Ans) To    from

$$6L + 13R = 19R \text{ (odd then add '1')}$$

$$= 19R + 1 \stackrel{\text{Total}}{\Rightarrow} 20R \stackrel{\text{adjacent}}{\Rightarrow} 20L \Rightarrow \underline{\text{T}}$$

Ex:-) In above problem which letter will be 4<sup>th</sup> to the right of 14<sup>th</sup> position from your left end.

A) To    from

$$4R + 14L \Rightarrow 18L \text{ (even, so subtract)}$$

$$\Rightarrow 18L - 1 \Rightarrow 17L$$

$$\Rightarrow 17R \Rightarrow \underline{\text{I}}$$

Ex:-) If in the English alphabets first half of the alphabets are written in reverse order, which letter will be 5<sup>th</sup> to the left of 13<sup>th</sup> position from your right end.

A) To    From  
 $5L + 13R \Rightarrow 18R$

E

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| L  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | R |
| M  | L  | K  | J  | I  | H  | G  | F  | E  | D  | C  | B  | A  |    |   |
| N  | O  | P  | Q  | R  | S  | T  | U  | V  | W  | X  | Y  | Z  |    |   |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |    |   |

(Ex:-) which letter will be midway b/w 6<sup>th</sup> position from left end and 11<sup>th</sup> from right end.

A)  $\xrightarrow{6L} \xleftarrow{11R} \Rightarrow \underline{\text{"K"}}$

(GHIJ) K (LMNO)

Ex:-) which letter will be midway b/w 7<sup>th</sup> position from left end and 9<sup>th</sup> from right end.

A)  $\xrightarrow{7L} \xleftarrow{9R}$

(H I J K L) (M N O P Q)

$\Rightarrow$  NO such letter is there.

Ex:-) which letter will be midway b/w 9<sup>th</sup> position from left end and 10<sup>th</sup> from right end.

A)  $\xrightarrow{9L} \xleftarrow{10R}$

(JKL) MNOP

$\Rightarrow \underline{\text{"M"}}$

Ex:-) which letter will be midway b/w 8<sup>th</sup> position from left and 12<sup>th</sup> from right.

A)  $\xrightarrow{8L} \xleftarrow{12R}$

(IJK) LMN

$\Rightarrow$  NO such letter

Note:-

- b1. Like it above type of problems if from either ends both are even (or) both are odd then there is no midway b/w them

2. If from either ends one is even and another one is odd then there is possibility for midway b/w them. Find that midway position given from either <sup>end</sup> subtract

from "26" and divide with  $\frac{2}{2}$  of remainder and rounded to next figure and add this fig to any position number and count from the way only.

(4)

$$\text{Ex:- } 26 - 19 = \frac{7}{2} = 3.5 \equiv 4 \quad \text{add this 4 to 26} \\ \Rightarrow 30 \text{ L}$$

Type - II Questions:-

~~Ex:-~~ Study the following sequence carefully and answer the questions as follows.

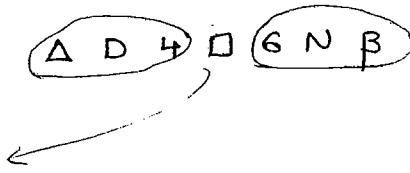
$$(1) \ A \ 3 \ B \ \Delta \ D \ 4 \ \square \ 6 \ N \ \beta \ 5 \ M \ 2 \ \star \ E \ 8 \quad (R) \ \underline{\text{Total = 16}}$$

~~Ex:-~~) In above sequence which letters (or) numbers, symbols will be midway b/w 4<sup>th</sup> position from left end and 6<sup>th</sup> position right end.

$$A) \ \overrightarrow{4} \quad \overleftarrow{6} \quad \Rightarrow 16 - 10 = 6 \Rightarrow \boxed{D \ 4 \ \square} \quad \boxed{6 \ N \ \beta} \\ \text{no such no. exist}$$

~~Ex:-~~) In above sequence which letter (or) number (or) symbol midway b/w 3<sup>rd</sup> to left and 6<sup>th</sup> to Right.

$$A) \ \overrightarrow{3 \text{ L}} \quad \overleftarrow{6 \text{ R}} \quad \Rightarrow 3 + 6 = 9 \\ 16 - 9 = \frac{7}{2} = 3.5 \equiv 4 \\ 4 + 3 = 7 \text{ L} \Rightarrow \square$$



~~Ex:-~~) In above sequence which letter (or) number (or) symbol will be 4<sup>th</sup> to right of 5<sup>th</sup> position from left end.

$$A) \ \underline{\text{To}} \quad \underline{\text{From}} \\ 4R + 5L \Rightarrow 9L \Rightarrow 'N'$$



~~Ex:-~~) In above sequence all adjacent positions are interchange then which letter or number or symbol will be 5<sup>th</sup> to the left of 16<sup>th</sup> position from your left end.

$$A) \ \underline{\text{To}} \quad \underline{\text{From}} \\ 5L - 16L \quad \swarrow (\text{interchange}) \\ \Rightarrow 11L \Rightarrow 11L + 1 \Rightarrow 12L \\ "M"$$

Ex:-) In above sequence all adjacent positions are interchange their places and also total sequence is written in reverse order then which letter, symbol, number will be 4<sup>th</sup> to the left and 7<sup>th</sup> from Right.

A) To / From

$$4L + 7R = 11R$$

$$11R + 1 = 12(R) \Rightarrow 12L \Rightarrow \underline{M}$$

Ex:-) In above sequence which letter will be 4<sup>th</sup> to the right of 5<sup>th</sup> position from left end. If that position is a symbol immediately preceded of that. If the position is a numbered immediately followed letter is your answer.

A) To / From

$$4R + 5L = 9L \Rightarrow \underline{N}$$

Ex:-) In above sequence letters are coded as FEMALES, numbers are coded as "MALES", symbols are coded as "CHILDRENS". How many CHILDRENS males are there. We are having either side females.

A)

|   |   |   |
|---|---|---|
| F | M | F |
| ↓ | ↓ | ↓ |
| L | N | L |

Ex:-) In above sequence according to their positions of the ratio b/w symbols to letters.

A)

|   |   |   |
|---|---|---|
| S | L |   |
| / | = |   |
| 4 | : | 6 |
| 2 | : | 3 |

## DIRECTION AND DISTANCES

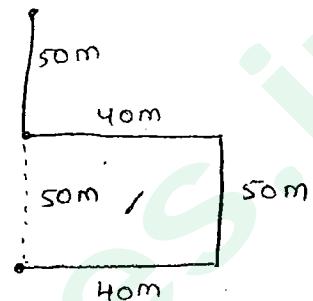
1. A man moves towards east and covers a distance of 40m then turns north and covers a distance of 50m. They turns west and covers a distance of 40m, they turns north, and covers 50m. How far is he from starting position.

A) 100 m

(or)

$E_{40}$   $N_{50}$   $W_{40}$   $N_{50}$

$$\text{add } 50 + 50 = 100 \text{ m}$$



( Different directions subtract, same direction add)

Note:-

Like in above type of problems if only one person covers the distance, in same direction add them. Eg:-  $E + E + E + \dots$ ,  $W + W + W + \dots$ ,  $S + S + S + \dots$ ,  $N + N + N + \dots$

In opposite direction subtract them. Eg:-  $E - W$ ,  $W - E$ ,

$S - N$ ,  $N - S$

2. A women moves towards north and covers a distance of 50m then turns east and covers 80m then turn south and covers 50m then turns west and covers 30m. How far is she from at reached position.

A)  $N_{50}$   $E_{80}$   $S_{50}$   $W_{30}$        $50 - 50 = 0$

$$\Rightarrow 80 - 30 = 50 \text{ m} \quad (\text{different direction})$$

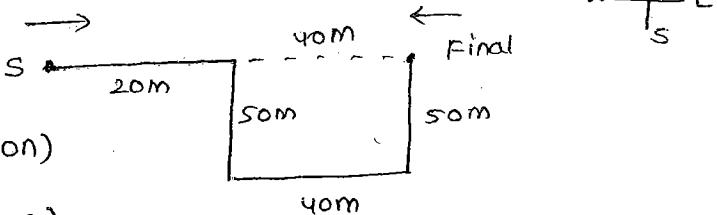
3. Raul moves towards east and covers a distance of 20m then turn south and covers a distance of 50m then turns east and covers a distance of 40m then turns north and covers a distance of 50m. How far and which direction is he from his starting position.

A)  $E_{20}$   $S_{50}$   $E_{40}$   $N_{50}$        $\Rightarrow 20 + 40 = 60 \text{ East}$

$$\Rightarrow 20 + 40$$

$\Rightarrow$  60m East (starting position)

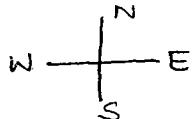
$\Rightarrow$  60m West (Final position)



Note:-

1. If directions asked from starting position (or) initial (or) original position then your direction is obtain ~~it~~ only one.
2. If direction asked from final position (or) end (or) reached position, then your direction is opposite of obtain one.
3. A rangeela drive towards south and covers a distance of 20 km then turns east and covers 50 km then turn south and covers 30 km then turns west and covers 50 km they turn south covers 40 km. How far and in which direction is she from a reached position.

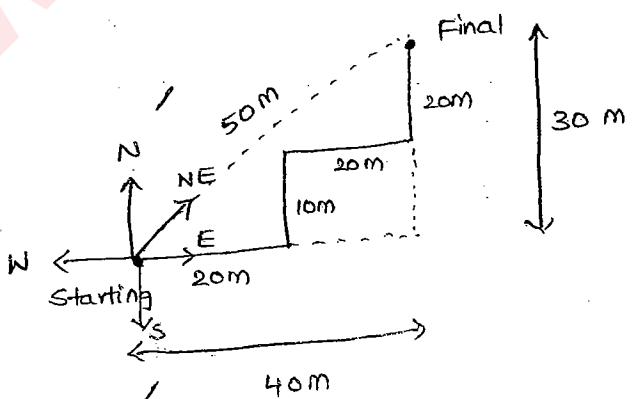
A)  $S_{20} \quad E_{50} \quad S_{30} \quad W_{50} \quad S_{40}$



$$\Rightarrow 20 + 30 + 40 = 90 \text{ km North.}$$

4. Arun moves towards east and covers a distance of 20m then turns north and covers a distance of 10m then turns east and covers 20m then turns north and then turns east and covers 20m. How far and in which direction is he from his initial position.

A)



$$\Rightarrow 50 \text{ m NE}$$

$$(or)$$

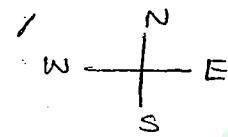
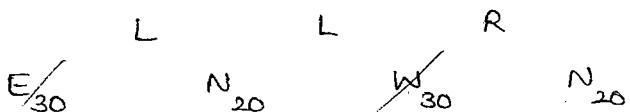
$$E_{20} \quad N_{10} \quad E_{20} \quad N_{20}$$

$$E_{40} \quad N_{30} \quad \Rightarrow \sqrt{40^2 + 30^2} = 50$$

$$\Rightarrow 50 \text{ m NE}$$

5. Suri moves towards east and covers a distance of 30m then turns left and covers 20m, then turns left and covers 30m, then turns right and covers 20m. How far and in which direction is he from his original position.

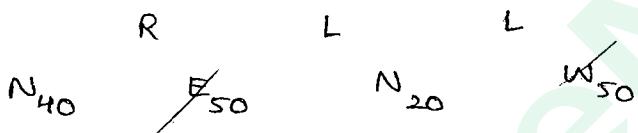
A)



$$\Rightarrow 20 + 20 = 40 \text{ m North} \text{ (Starting position)}$$

6. Kranti moves towards north and covers a distance of 40m then turns right and covers a distance of 50m then turns left and covers 20m, then turns left again and covers 50m. How far and in which direction is he from his reached position.

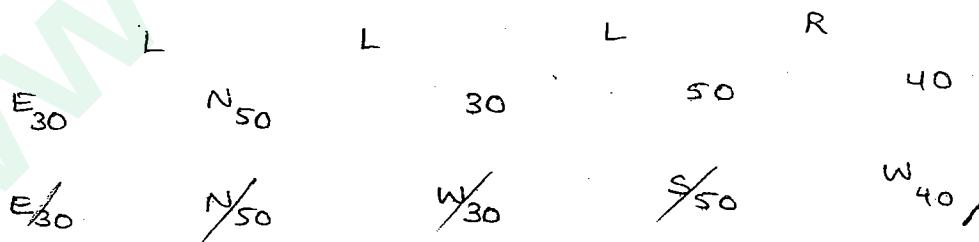
A)



$$\Rightarrow 40 + 20 = 60 \text{ m S} \text{ (Reached position)}$$

7. Dayana drive towards east and covers 30 km, then turns left and covers 50 km, then turns left and covers 30 km, then turns left and covers 50 km, then turns right and covers 40 km and died. How far and in which direction is she from a death position.

A)



$$\Rightarrow 40 \text{ km East} \text{ (reached position)}$$

Note:-

Like in above type of problems

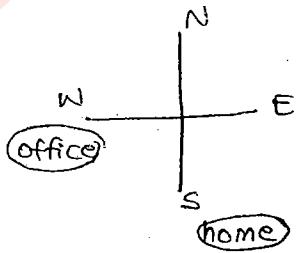
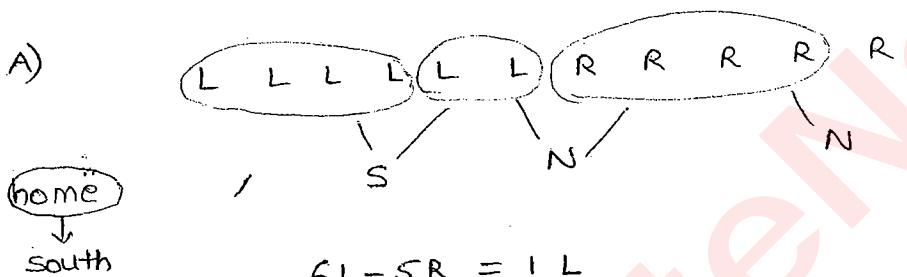
- 1. If starts from any one 'x' position, both are same positions  
Left - Left (or) Right - Right the next direction is opposite of

2. If starts from any one  $x$ -direction, both are different terms Left - Right (or) Right - Left, the next direction is same as  $x$ -direction.

$$x' \left\{ \begin{array}{l} L - R \\ \text{(or)} \\ R - L \end{array} \right\} \text{ same as } x\text{-direction.}$$

$$x - \left\{ \begin{array}{l} L - L \\ \text{or} \\ R - R \end{array} \right\} \text{ opposite of } x\text{-direction.}$$

8. Amar moves to office from his home, he reaches in office after 6 left turns and 5 right turns. If his home is in south then in which direction is his office.



Office in "West"

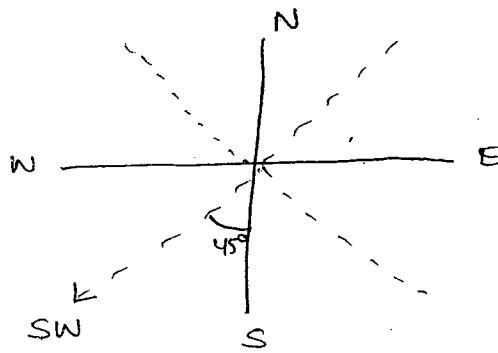
Note:-

$$x' \left\{ \begin{array}{l} L - L - L - L \\ \text{(or)} \\ R - R - R - R \end{array} \right\} \text{ - same as } x\text{-direction.}$$

1. Right hand turn is clockwise direction.  
 2. Left hand turn is Anti-clockwise direction.
9. I am facing towards south then turns clockwise with an angle of  $45^\circ$  then turns anti-clockwise with an angle of  $90^\circ$  they turn clockwise with an angle of  $135^\circ$ , they turn anti-c.w with  $90^\circ$ , they turn clock wise with  $45^\circ$ . In which direction I am facing now?

A.  $C_{45^\circ}$   $A_{90^\circ}$   $C_{135^\circ}$   $A_{90^\circ}$   $C_{45^\circ}$

Add all clockwise



$C_{275^\circ}$

Add all Anticlockwise

$A_{180^\circ}$

$$\Rightarrow C_{275} - 180 = 45^\circ$$

$\Rightarrow C_{45^\circ}$

$\Rightarrow \text{SW}$

10. Gajini facing towards North east then turns clockwise with an angle of  $20^\circ$  they turns anti clockwise with an angle of  $35^\circ$  they turns clockwise with  $30^\circ$ , they turns anti-clock wise with  $55^\circ$  then turns clockwise with  $40^\circ$ . In which direction he facing now.

A) Gajini facing NE

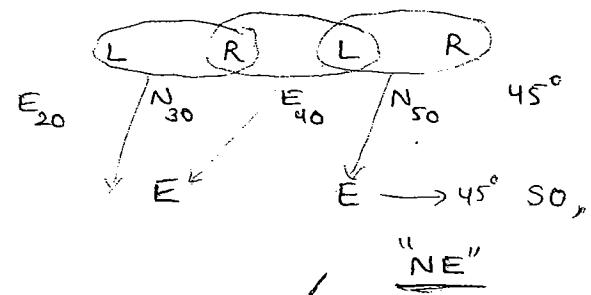
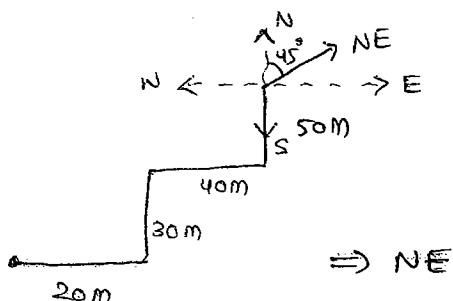
$C_{20^\circ}$   $A_{35^\circ}$   $C_{30^\circ}$   $A_{55^\circ}$   $A_C 40^\circ$

$\Rightarrow C_{90^\circ} \cdot A_{90^\circ}$

$\Rightarrow 90 - 90 = 0^\circ$  (same direction)

$\Rightarrow \underline{\text{NE}}$

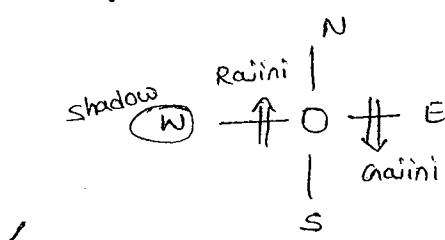
11. Rajini moves towards east and covers 20m, they turns left 30 and covers 30m, they turns right and covers 40m they turns left and covers 50m, they turns right with an angle of  $45^\circ$ . In which direction he facing now.



Note:-

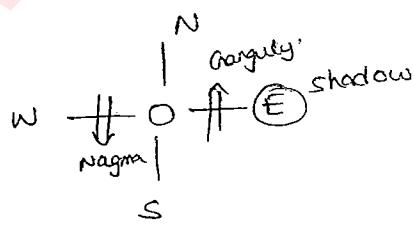
1. In morning hours after sunrise our shadow falls towards west direction.
2. In evening hours before sunset our shadow falls towards east direction.
12. In one morning hours after sun raise Ravini and Gavini facing to each other and talk, at one cross roads in hyd the shadow of Ravini falls exactly to his left hand side. Which direction Gavini was facing now.

A) Gavini facing South



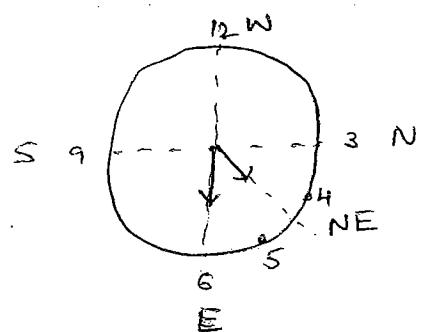
13. In one evening hours before sunsets Nagma and Gangu are facing to each and talk to each other at one cross roads at Kolkata. The shadow of Nagma falls exactly to right of Gangu. Then it which direction Nagma was facing now.

A) Nagma facing south.



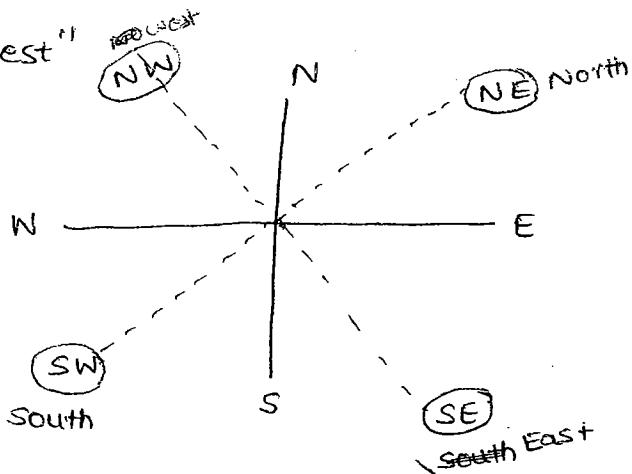
14. A watch reads 4:30 hrs, if minutes hand points towards east then in which direction hours and points now.

A) "NE"



15. If south East is called East, North west is called west, SW is called south and so on. Then what /be North called

A) "North West"



### NUMBER, TIME SEQUENCE, RANKING AND COMPARISON :- (4-8Q)

preceded → previous → Before →

preceded by 4 is 3 → 34

Followed → After → Next

1. How many times 1, 2, 3 are come consequently in which 1 being in the middle and 2 and 3 are either sides of 1.

- A. 1 2 (3 1 2) 2 (1 3) 3 1 1 (2 1 (3) 1 2) 2 (1 3) 3 1 1 2 2 3 3 4 1 2 3 1 2 3  
 2 1 3  
 3 1 2

Ans:- 6 times

2. How many even digits are there in the following sequence which are immediately preceded to even digit products is equal to 1 even number?

- A. 4 2 3 4 4 5 4 3 6 4 9 6 7 3 5 4 9 6 7 8 6 4 9 6 7 3 5 4 9 6, 2 7 3 4 9 6

(exc) e (0 x 0)

e e o

e - even

o - odd

Ans:- cannot be determined.

3. In above sequence how many even no's of are there which are immediately proceeded by two even digit products is subtracting from followed by odd digit product is equal to an odd number.

- A) (e-3), 0-2

None.

4. In the following series how many such odd no. are there which are divisible by 3 or by 5, then followed by odd no's and then also followed by even no's.

- a) Nil b) 1 c) 2 d) three

A) 12, 19, 21, (3, 25, 18) 35, 20, 22, (21, 45, 46), 47, 48, 9, 50, 52, 54, 55, 56

Odd no. Odd even = 0 0 C

(Divisible  
by 3 or 5)

5. How many numbers are there from 1 to 150 which are exactly by 7 but not by 3.

- a) 4 b) 5 c) 6 d) 7

A) 7, 14, (21) 28, 35, (42) 49

Ans:- 5 No's

shortcut:- applicable by for only prime no's i.e., (7, 3) both are prime numbers.

$$\frac{50}{7} = \frac{7^2 5}{7} = 7^2 5$$

$$(7-2) = 5$$

6. How many no. are there from 1 to 50 which are exactly by 7 and also divisible by 3.

A) 7, 14, (21) 28, 35, (42) 49

Ans:- 2 No's

7. How many no. are there from 1 to 700 (i) which are exactly by 7 but not by 3 (ii) which are exactly divisible by 7 but also by 3.

A) (i)  $\frac{700}{7} = \frac{100}{3} = (100 - 33) = 67$  No's

(ii)  $\frac{700}{7} =$

8. How many no's are there from 1 to 81 which are exactly divisible by 9 not by 3.

Ans:- zero.

9. How many no's are there from 1 to 81 which are exactly divisible by '9' not by 9

Ans:- 3 6 ⑨ 12 15 ⑯ 21 24 ⑰ 30 33 ⑯ 39 42 ⑮  
48 51 ⑯ 57 60 ⑯ 66 69 ⑯ 75 78 ⑯

Total 18 No's

shortcut:-

$$1 \text{ to } 81 \text{ by } 3 = \frac{81}{3} = 27$$

$$1 \text{ to } 81 \text{ by } 9 = \frac{81}{9} = 9 \quad (-)$$

18

Note:-

Like in above type of problems if any one is square of another, first divisible with big no. then not divisible with small no. possibility is not present. First divisible with small no. then not divisible with big no's possibility present. Find such possibilities as follows.

10. How many no's are there from 1 to 4000 (i) which are divisible by 4 but not by 2 (ii) which divisible by 2 but not by 4.

A) i) zero

ii)  $\frac{4000}{2} = 2000$

$$\frac{4000}{4} = 1000 \quad (-)$$

2000 = Ans 1000 No's.

11. The numbers from 1 to 85 by which are exactly divisible by 5 are arranged from ascending order from top. Then which no. will be 11<sup>th</sup> position from top.

A. 5 10 15 20 25 30 35 40 45 50 (55) 60 65 70 75 80 85

Shortcut:-

For ascending order from top @  $11 \times 5 = 55$

12. In above problems which no. will be is in 11<sup>th</sup> position from bottom.

A.  $\frac{85}{5} = 17$ ,  $(17-11) = 6+1 = 7 \times 5 = 35$

Note:-

1. If starts from small no. then required no. is  $\geq$  equal to given number of position  $\times$  divisible number.

2. If starts from big number then required number is equal to  $(\text{Total} - \text{given position}) \times \text{divisible number}$ .

13. In above problem which number will be is in 15<sup>th</sup> position from bottom.

A.  $\frac{85}{5} = 17 \Rightarrow (17-15) = (2+1) \times 5 = 15$ .

14. Mithun was counting down from 32. sumit was counting upwards the number starting from 1 and he was calling out only the odd no. and what common number will be calling out at same time and same speed.

a) 19 b) 21 c) 22 d) They will not call out the same no.

A) Mithun: 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19

Sumit: 1, 3, 5, 7, 11, 13, 15, 17, 19, 21, 23

15. If 1<sup>st</sup> and 2<sup>nd</sup> digits in the sequence 5981327438 are interchanged and also 3<sup>rd</sup> and 4<sup>th</sup> digits, 5<sup>th</sup> & 6<sup>th</sup> digits and so on, which digits will be 7<sup>th</sup> counting to your left.

O A) shortcut :-

7<sup>th</sup> from right

For odd no. add 1

$7+1=8$  from right

5 9 8 1 3 2 7 4 3 8

$\Rightarrow 8$

16. If the position of the 1<sup>st</sup> and 6<sup>th</sup> digits of sequence of 8903214675 are interchanged 2 and 7 and so on which no. would be 7<sup>th</sup> from right end.

- a) 2    b) 6    c) 7    d) 8

A) 8 9 0 3 2 1 4 6 7 5  
1 2 3 4 5 6 7 8 9 10

1-6  
2-7  
3-8  
4-9  
5-10

7<sup>th</sup> from right end = 3 it interchanges from 4 to 9 then 9<sup>th</sup> letter = 7

17. The letters L, M, N, O, P, Q, R, S, T in their order are substituted by 9 integers 1 to 9 but not in that order. 4 is ascend to P. The difference b/w P & T is "5". The difference b/w N & T is 3. what is integer ascend to N.

- a) 4    b) 5    c) 6    d) 7

A) L to T = 1 to 9 (not in that order)

$$(i) P=4; (P \sim T)=5 \text{ i.e., } \left. \begin{array}{l} P-T \\ T-P \end{array} \right\} = 5$$

$$(ii) \left. \begin{array}{l} N-T \\ T-N \end{array} \right\} = 3$$

a)  $P-T=5 \Rightarrow 4-T=5 \Rightarrow T=-1$  (It is not in 1 to 9)

b)  $T-P=5 \Rightarrow T-4=5 \Rightarrow T=9$  (OK)

c)  $N-9=3 \Rightarrow N=3+9=12$  (X)

d)  $T-N=3 \Rightarrow 9-N=3 \Rightarrow N=6$  (OK)

18. 36 vehicles are parked in a parking ground in a single row. After first car there is 1 scooter, after second car there are 2 scooters. After 3 cars, 3 scooters and so on work out the how many scooters in the 2nd half of the row.

| A) | 1              | 2  | 3              | 4  | 5  | 6              | 7  | 8              | 9  | 10             | 11 | 12 | 13 | 14 |
|----|----------------|----|----------------|----|----|----------------|----|----------------|----|----------------|----|----|----|----|
|    | C <sub>1</sub> | S  | C <sub>2</sub> | S  | S  | C <sub>3</sub> | S  | S              | S  | C <sub>4</sub> | S  | S  | S  | S  |
|    | 15             | 16 | 17             | 18 |    | 19             | 20 | 21             | 22 | 23             | 24 | 25 | 26 | 27 |
|    | C <sub>5</sub> | S  | S              | S  |    | S              | S  | C <sub>6</sub> | S  | S              | S  | S  | S  | S  |
|    | 28             | 29 | 30             | 31 | 32 | 33             | 34 | 35             | 36 |                |    |    |    |    |
|    | C <sub>7</sub> | S  | S              | S  | S  | S              | S  | S              | S  | C <sub>8</sub> |    |    |    |    |

shortcut:-

$$C_1 \ 1 \ C_2 \ 2 \ C_3 \ 3 \ C_4 \ 4 \ C_5 \ \underbrace{5 \ C_6 \ 6 \ C_7 \ 7 \ C_8}_{(18-3) = 15 \text{ No's}} \\ 1 + 1 + 1 + 2 + 1 + 3 + 1 + 4 + 1 + 5 + 1 + 6 + 1 + 7 + 1 = 36$$

$$(18 - 3) = 15 \text{ No's scooters} \\ \downarrow \\ 3 \text{ cars in second half}$$

19. In the following sequence of instructions 1 stands for run, 2 stands for stop and 3 stands for go, 4 stands for sit, 5 stands for wait the sequence is continued, then which sequence is next.

4 4 5 4 5 3 4 5 3 1 4 5 3 1 2 4 5 4 5 3 4 5 3

- a) wait b) sit c) go d) Run

A) 4 | 45 | 453 | 4531 | 45312 | 45 | 453 | 4531  
→ is continued

Ans: 1 = run

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