Reasoning Ability

CRACKER

We are providing the Reasoning Cracker so that you can score high in the Reasoning section in the upcoming exams. Some of the Tips and Tricks to solve different reasoning questions based on different topics are given below. Some important topics are -:

- ALPHANUMERIC SERIES
- DISTANCE AND DIRECTION
- BLOOD RELATION
- INEQUALITY
- ORDER AND RANKING
- SYLLOGISM

ALPHANUMERIC SERIES

Alphanumeric (sometimes shortened to alphanumeric) is a combination of alphabetic and numeric characters. In some cases, it may include upper and lower case letters, punctuation marks, and symbols (such as @, &, and *,).
This type of reasoning is a mixed bag of coding-decoding, series-based reasoning and finding positions based reasoning questions.

Points to be noted:

Before jumping to the questions, let us understand the meaning of few key words that are generally used in such questions like "**following, followed by, preceding, and preceded by".**

●Let us take two successive alphabets Y and Z. Here, Y is preceding Z and Z is preceded by Y. Also,
Z is following Y and Y is followed by Z.

●Now, take three successive alphabets X, Y and Z. Here X and Y are preceding Z, but Y is immediately preceding Z whereas, X is not immediately preceding Z. Similarly, Y and Z are following X, but Y is immediately following X whereas, Z is not immediately following X.

Steps to solve the question:

Example 1:
Study the following digit-letter-symbol sequence carefully and answer the questions given below:

2 R ★ C f 8 E $ G 2 ¥ 4 9 L c δ B< K 1& A W ? P e Ψ Q @ 7 F 6

1.If the first half of the series is written in reverse order, then which Element will be twenty-first from the right end?

TRICK:
No need of writing the series in reverse order
Step 1: Count the total number of alpha-numerical =32
Step 2: As we are considering half of the series, divide by two =32/2=16
Required 21R = 16R+5R
Instead of taking 5R take 5L (since first half is reversed)
16R+5L=f (Answer)

2. Which element will be twenty-first from the right end, if second half of the series is reversed?

TRICK:
No need of writing the series in reverse order
Step 1: Count the total number of alpha-numerical =32
Step 2: As we are considering half of the series, divide by two =32/2=16
Required 21R = 16R+5R
16R+5R (belongs to first half do not reverse) =4 (Answer)

3. If the above sequence is written in reverse order, then which element will be 5th to the right of 16th element from the right end?

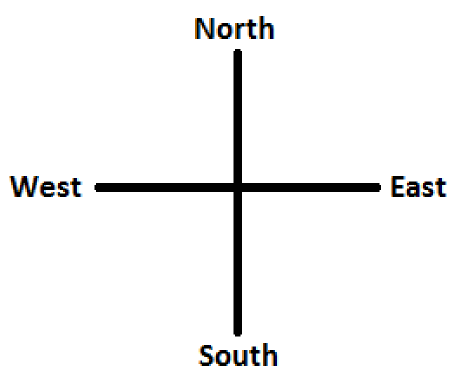
TRICK:
If both are in same direction (subtract)
=To From
=16R – 5R
=11R
=11L (trick: To reverse order change R to L)
=¥ (Answer)

4. Which element is seventh to the left of sixteenth element from the right in the above sequence?

TRICK:
If both are in opposite direction (add)
=To From
=7L + 16R
=23R = 2 (Answer)

DISTANCE AND DIRECTION

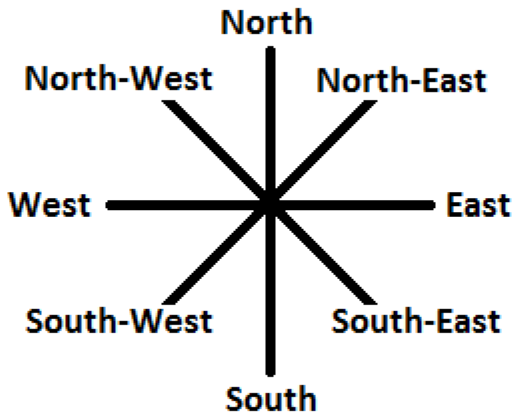
DIRECTIONS
The first thing to remember is that there are four directions. These directions are given under.



JOINT DIRECTIONS
For the person standing in the area falling between:

- The area between North and east direction is called North-East.
- The area between South and East is called South-East.
- The area between North and West is called North-West.

- The area between South and West is called South-West.



Every turn taken clockwise (CW) means taking a right turn and Anti-clock wise (ACW) turn means taking left turn.

RULES FOR DISTANCE AND DIRECTION

Turning By 90°

Direction before taking turn	Direction in which the person or vehicle will be moving after taking the turn	
	Left (ACW)	**Right (CW)**
East	North	South
West	South	North
North	West	East
South	East	West

Turning By 45°

Move by 45° means half of 90° means we have to take turn just half of 90°.

Direction before taking turn	Direction in which the person or vehicle will be moving after taking the turn	
	Left (ACW)	**Right (CW)**
East	North-East	South-East
West	South-West	North-West
North	North-West	North-East
South	South-East	South-West

Turning By 135°

Direction before taking turn	Direction in which the person or vehicle will be moving after taking the turn	
	Left (ACW)	**Right (CW)**
East	North-West	South-East
West	South-East	North-East
North	South-West	South-East
South	North-East	North-West

Turning By 180°

Direction before taking turn	Direction in which the person or vehicle will be moving after taking the turn	
	Left (ACW)	**Right (CW)**
East	West	West
West	East	East
North	South	South
South	North	North

Finding out Distance

To find out the shortest distance between the two points i.e. starting point and the destination point, the starting and destination points are joined by a straight line and distance is observed. For this we use Pythagoras theorem which is as follows:

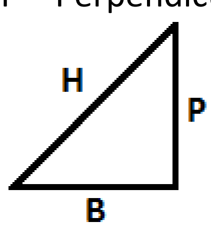
Pythagoras Theorem

Which says, $H^2 = B^2 + P^2$

Where, H – Hypotenuse

B – Base

P – Perpendicular



Some Important Points

- At the time of sunrise if a man stands facing the east, his shadow will be towards the west.
- If a man stands facing the North, at the time of sunrise his shadow will be towards his left and at the time of sunset it will be towards his right.
- At 12:00 noon, the rays of the sun are vertically downward hence there will be no shadow.

Blood Relation

Blood relation shows the different relations among the members of a family. Based on the information given we have to find relation between particular members of the family.

In general, the problems contain stages of family. It explains through a statement and we have to analyze the relation between them. Generally, the question deals with a hierarchical structure which is based on seven generation three above & three below.

Generation Table

Generation	Male	Female
Three generations above↑↑↑	Great grandfather Maternal great grandfather Great grandfather-in-law	Great grandmother Maternal great grandmother Great grandmother-in-law
Two generations above ↑↑	Grandfather Maternal grandfather Grandfather-in-law	Grandmother Maternal grandmother Grandmother-in-law
One generations above ↑	Father, Uncle, Maternal uncle, Father-in-law	Mother, Aunt Maternal aunt, Mother-in-law
Current generation(Self) →	Husband, Brother Cousin, Brother-in-law	Wife, Sister Cousin, Sister-in-law
One generation below ↓	Son Nephew	Daughter Niece

	Son-in-law	Daughter-in-law
Two generations below ↓↓	Grandson Grandson-in-law	Grand daughter Grand daughter-in-law
Three generations below ↓↓↓	Great grandson Great grandson-in-law	Great grand daughter Great grand daughter-in-law

Pictorials which are used to define the relationship among them:

□/+ These two pictorials from are used for males.

○/− These two pictorials from are used for females

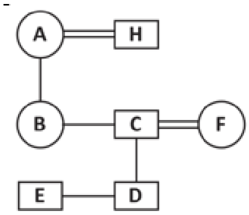
Types of questions:

1. Based on Dialogue or Conversation:
In this type of questions, the one person talking to or doing chit -chat with another person gives information by pointing to some picture or person.

Example: Introducing a boy, a girl said, "He is the son of the daughter of the father of my uncle." How is the boy related to the girl?
Solution:
The father of the boy's uncle => the grandfather of the boy and daughter of the grandfather => sister of father.

2. Based on Puzzle:
In these types of questions, you have to conclude the relation between two given persons based on more than one information given in the question.
Example: A is the mother of B. B is the sister of C. D is the son of C. E is the brother of D. F is the mother of E. H has only two children B and C. How F is related to E?

Solution:



So, F is mother of E.

3. BASED ON SYMBOLS:

In these types of questions, you have to conclude the relations between two given persons based on more than one information given in the question.

Based on Symbols: #, %,#,< @I etc. this type of question, information are coded in the form of symbols.

Example:

Directions (1 to 5): Study the following instructions and answer Questions given below:

X $ Y means X is mother of Y

X # Y means X is father of Y

X @ Y means X is husband of Y

X % Y means X is daughter of Y

Q1: A@B$M#C indicates what relationship of A with C?

(A) Paternal grandmother (B) Maternal grandmother

(C) Paternal grandfather (D) Maternal grandfather

(E) None of these

Ans: (C) Since A is father of M and M is father of C. So A is grandfather of C.

Q2: If N $ L @ I, how is I related to N?

(A) Mother in law (B) Daughter in law

(C) Aunt (D) Daughter

(E) None of these

Ans: (B) L is son of N and L is husband of I. So I is daughter-in-law of N.

INEQUALITY

In these questions, you will be provided with a statement consisting of a group of elements. These elements will be having a certain coded relationship among them which is denoted by different inequality symbols, “=, >, <, ≥, ≤”.

Signs	Meaning
<	Less than
>	Greater than
≤	Less than or equal to
≥	More than or equal to
=	Equal to

Let us consider A and B as two variables, then Inequalities can be shown as following:

Signs	Meaning
$A < B$	A is less than B
$A > B$	A is more than B
$A \leq B$	A is less than or equal to B
$A \geq B$	A is more than or equal to B
$A = B$	A is equal to B

Types of Inequality:

(A) Direct Inequality in which direct symbols will be given in the statement.

The relationship between certain statements and their meaning is given below in a tabular form.

S.No	Statement	Conclusion
1.	$A > B > C$	
2.	$A > B \geq C$	
3.	$A \geq B > C$	$A > C$
4.	$A = B > C$	
5.	$A > B = C$	
6.	$A < B < C$	
7.	$A < B \leq C$	
8.	$A \leq B < C$	$A < C$
9.	$A = B < C$	
10.	$A < B = C$	
11.	$A \geq B \geq C$	
12.	$A = B \geq C$	$A \geq C$(Either $A > C$ or $A=C$)
13.	$A \geq B = C$	
14.	$A \leq B \leq C$	
15.	$A = B \leq C$	$A \leq C$ (Either $A < C$ or $A = C$)
16.	$A \leq B = C$	
17.	$A < B > C$	Either 1 or 2 follows if any of the following cases (a, b, c
18.	$A \leq B > C$	and d) are given as they from a complementary pair.
19.	$A < B \geq C$	(a) 1. $A > C$ 2. $A \leq C$
20.	$A > B < C$	(b) 1. $A > C$ 2. $A < C$
21.	$A > B \leq C$	(c) 1. $A < C$ 2. $A \geq C$
22.	$A \geq B < C$	(d) 1. $A \leq C$ 2. $A > C$

Example1. Statements: Q ≥ P < N, R = N ≤ W
Conclusions: I. W > P II. Q ≥ R
(a) If only conclusion I is true.
(b) If only conclusion II is true.
(c) If either conclusion I or II is true.
(d) If neither conclusion I nor II is true.
(e) If both conclusion I and II are true.
Sol: (a) Q ≥ P < N ... (i)
R = N ≤ W ... (ii)
Combining both statements, we get
Q ≥ P < N = R ≤ W
Thus, P < W or W > P is true.
But, we can't compare Q and R. Hence II (Q ≥ R) is not true.
Example2. Statements: G = C ≥ T = S, K ≥ C, S < V
Conclusions: I. K ≥ S II. T < V
(a) If only conclusion I is true.
(b) If only conclusion II is true.
(c) If either conclusion I or II is true.
(d) If neither conclusions I nor II is true.
(e) If both conclusion I and II are true.
Sol: (e) Given statements: G = C ≥ T = S ... (I)
K ≥ C ... (ii)
S < V ... (iii)
Combining all these statements, we get
K ≥ G = C ≥ T = S < V
Thus, K ≥ S is true. Again, T < V is true.

(B) Coded Inequality in which coded symbols (like @, %, $ etc) will be given and what they signify will be provided separately.
Directions: In the following questions, the symbols δ, @, ©, % and □ are used with the following meaning as illustrated below.
P$Q means P is not smaller than Q
P@Q means P is neither smaller than nor equal to Q
P#Q means P is neither greater than nor equal to Q

P&Q means P is neither greater than nor smaller than Q
P*Q means P is not greater than Q

1. Statements: A & I, I $ C, C # K, K * M

Conclusions:

I. M # C II. C # M

III. K & M IV. K # M

(A) Only I is true
(B) Only III is true
(C) Only IV is true
(D) Either III or IV is true
(E) Either III or IV and II are true

Sol:

$ - ≥	@ - >	# - <	& - =	* - ≤

(E)

A=I≥C<K≤M

M<C; C<M; K=M; K<M

2. Statements: S * P, P $ L, L # Q, Q @ K

Conclusions:

I. K # L II. P @ Q

III. S # Q IV. P @ K

(A) None is true
(B) Only I is true
(C) Only II is true
(D) Only III is true
(E) Only IV is true

Sol: (A)

S≤P≥L<Q>K

K<L; P>Q; S<Q; P>K

SYLLOGISM

The word ‘Syllogism’ refers to ‘Logic’. Syllogism is an instance of a form of reasoning, in which a conclusion is drawn from a set of given or assumed statements; a common or middle term is present in the statements but not in the conclusion, which is assumed to be true.

Note: 1. Consider statements are always truth that is statement is universal truth. This is main concept of syllogism.

2. You must understand their statement and after that, considered on their conclusion.

Quantifiers

A quantifier is essentially used to express the quantity of the given sets.

Different types of quantifiers:

1. All/ Every: The term all refers to all the objects in the given sets. All/ every is referred to as Universal quantifier as it refers to each object in the set.

Example: All A are B – It means all the elements in the set A are B.

2. No/ None: The term no refers to all the objects in the given sets. No/ none is referred to as Universal quantifier as it refers to each object in the set.

Example: No A is B – It means that each and every element in A is not the part of set B.

3. Some/ Few: The term some refers to a certain number of objects in the set. It is normally referred to as a particular quantifier.

We need to understand the range of the quantifier 'some'.

Some Common Rules in Syllogisms

Following are some common rules that you must know in order to solve Syllogism based problems:

First Premise	+	Second Premise	=	Conclusion
All	+	All	=	All
All	+	Some	=	No Conclusion
All	+	No	=	No
Some	+	All	=	Some
Some	+	Some	=	No Conclusion
Some	+	Not	=	Some Not
No	+	All	=	Some Not (Reversed)
No	+	Some	=	Some Not (Reversed)
No	+	No	=	No Conclusion
Some Not	+	All	=	No Conclusion
Some Not	+	Some	=	No Conclusion
Some Not	+	No	=	No Conclusion

The most important are the possibility cases and you will need the below rules to attempt such type of questions:

- If All A are B then Some B are Not A is a Possibility.
- If Some B are Not A then All A are B is a Possibility.
- If Some A are B then All A are B is a Possibility & All B are A is a Possibility.

That is

- All <=> Some Not Reversed
- Some => All
- NO Conclusion = Any Possibility is true

The most important part about possibilities cases is that we have to create all possibilities to find whether the given conclusion is possible or not. If the conclusion satisfies all the possibilities only then it is assumed to be correct.

ORDER AND RANKING

In ordering and ranking arrangement questions, position/rank of a person from left-right/top-bottom of a row/class is to be determined or rank/position is given & total no. of persons is to be calculated. You may also be asked to determine, using data given, which floor which person lives on.

Now, let's discuss each different case in Rank and Order.

TYPE I:

1) Total number of persons = {(sum of positions of same person from both sides i.e. left and right side) – 1}

OR

2) Position of a person from opposite side = {(Total no. of persons – Position of same person from given side) +1}

TYPE II:

1) Total no. of persons = No. of persons after or before the given person in a row + Position of same person from the other side.

OR

2) No. of persons after or before the given person in a row = Total no. of persons – Position of same person from other side

TYPE III:

No. of students between two different persons = Total no. of students – (Sum of positions of two different persons from opposite sides)

TYPE IV:

No. of students between two different persons = (Sum of positions of two different persons from opposite sides) – Total no. of students – 2

TYPE V:

If total no. of students is to be calculated and positions of different persons from any side are given then it is always a case of 'cannot be determined' or 'data inadequate' or 'can't say'. This is because we do not know if there is overlapping or not.

Type VI:

In the questions where it is asked to find minimum no. of persons in a row then it is always a case of overlapping i.e. given positions of persons from either sides overlap each other.

Then, Minimum no. of persons = Sum of positions of persons from both sides – Persons between them – 2

Type VII:

If positions of two different persons are given from opposite sides of the row and a third person is sitting exactly in middle of the two and total no. of persons in the row is to be calculated as

1) When position of third person sitting is given from either side of row.

2) When position of third person is given from either of the two persons between whom he/she is sitting.