**Permutation & Combination**

**Total Number of Arrangement**

1. GAME
2. CRYSTAL
3. SYSTEM
4. DLETTER
5. COLLEGE

**Vowels Comes together**

1. JUDGE
2. MACHINE
3. SISTER
4. PREPARE

**Some letters Comes together**

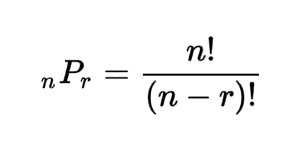
1. CRYSTAL = > YS-always comes together
2. EDUCATION => UAT -always comes together
3. LESSON => EON - always comes together
4. COLLEGE= > CO - always comes together

**Vowels Never Comes together**

**Vowels Never Comes together = Total Number of Arrangement - Vowels comes together**

1. ENGLISH {(EI)NGLSH) }
2. OPTICAL { (OIA)PTCL}
3. LEADER { (EAE) LDR}
4. TRAINING { (AII) TRNNG }

**NO Two Vowel Comes together**

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**n= number of objects , r = number of objects arranged**

1. BANKER
2. COMPUTER
3. FILLED

**Vowels in ODD / EVEN places**

1. DETAIL
2. LEADING
3. P O U N D I N G
4. ‘ALLAHABAD’ - vowels in even places

**Based On Numbers -Repetition Allowed/ Not Allowed**

1. 1,2,3,4,5,6 - ( 4 digit number - without repetition)
2. 1,2,3,4,5,6 -( 4 digit number - with repetition)
3. 1,0,3,5,4 - ( 4 digit number - without repetition)
4. 1,0,3,5,4 - ( 4 digit number - without repetition)
5. {2,3,5,1,7,9} - 4 digit even number -without repetition
6. {2,3,5,1,7,9} - 4 digit even number -with repetition

**Circular Permutation:**

1. If 5 persons are to be seated in a circular table, how many different arrangements are possible?
2. If 5 boys & 5 girls are to be seated alternately in a circular table, how many different arrangements are possible?
3. Find the number of ways in which 5 persons A, B, C, D, E can be seated at a round table such that C and D must not sit together?

**GENERAL QUESTIONS:**

1. If 4 couples are going to a theater. Their seat numbers are consecutive. In how many ways can they be seated if the couples are to be seated together?
2. There are 10 true-false questions in an examination. Then, these questions can be answered in how many ways ?
3. A question paper consists of five problems, each problem having three internal choices. In how many ways can a candidate attempt one or more problems?
4. Find the number of ways in which 5 boys and 3 girls can be arranged in a row so that no two girls are together?
5. In how many ways can 5 boys and 5 girls sit in a circle so that no two boys sit together?
6. In how many ways can 4 boys and 5 girls be seated alternately in line?
7. A letter lock consists of three rings each marked with 10 different letters. In how many ways is it possible to make an unsuccessful attempt to open the lock ?

**COMBINATION**

**Basic Problems**

1. In how many ways 2 boys can select from 8 boys?
2. In how many ways a 4 member team selects from 8 boys and 3 girls, which is 3 boys and 1 girl?
3. In how many ways can a 3 member team select from 8 boys and 3 girls, which is either boys or girls?
4. In how many ways can we select 4 member teams from 5 boys & 3 girls, at least one girl should be included?
5. How many ways can this be done, A committee of 5 persons is to be formed from 6 men and 4 women, at most 2 women are included?

a. 3 men & 2 women

b. 4 men & 1 woman

c. 5 men

1. In how many ways can three consonants and two vowels be selected from the letters of the word ‘TRIANGLE’?
2. A college has 10 basketball players. A 5 member team and a captain will be selected out of these 10 players.How many different sections can be made?
3. The Indian Cricket team consists of 16 players.It includes 2 wicket keepers and 5 bowlers. In how many ways can a cricket eleven be selected if we have to select 1 wicket keeper and atleast 4 bowlers?
4. If 12 people at a party shake hands once with everyone else in the room. How many handshakes took place?
5. There are 7 non-collinear points. How many triangles can be drawn by joining these points?
6. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?
7. In how many ways, 10 identical chocolates are distributed among 3 children such that each child gets at least 1 chocolate?