Basics Of Permutation & Combinations.

① Factorial :- $n!$ is the product Of first n natural numbers

→ $1! = 1 = 1$

$2! = 2 \times 1 = 2$

$3! = 3 \times 2 \times 1 = 6$

$4! = 4 \times 3 \times 2 \times 1 = 24$

$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$

$6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$

→ n → always natural numbers

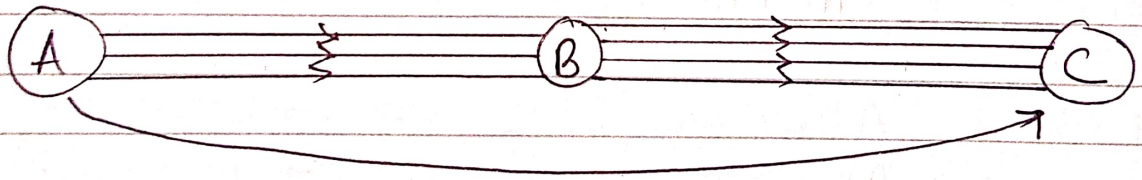
→ $\boxed{0! = 1}$ → Exception

→ F. Principle Of Counting :-

* Multiplication Rule :-

For Example :-

→ find the Number Of Ways :-



$3 \times 4 \Rightarrow$ 12 ways

Eg →

$3 \times 2 \times 1$

Ram
Sham
Aam

$= 6$ types Of arrangement

Ex. →

$\underline{A} \times \underline{B} \times \underline{C} \times \underline{D} \times \underline{E}$

$5 \times 4 \times 3 \times 2 \times 1 = 120$

Imp.

→ n distinct objects n places objects
= $n!_0$ = $\lfloor n$

Ex. →

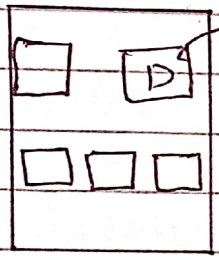
6 people

6 × 5 × 4 × 3

→ 2 people left

= 30 × 12 = 360

Ex. →



→ 2 people

2 × 4 × 3 × 2 × 1 = 48 . type of arrangement

Ex. → Dictionary Based.

No. Of Ways SUMAN can be arranged. :- $5!_0$ ⇒ 5 × 4 × 3 × 2 × 1 = 120

Rank Of SUMAN in dictionary :-

Step-1 → A M N S U

Step-2 →

A _ _ _ _ = $4!_0$ = 24
M _ _ _ _ = $4!_0$ = 24
N _ _ _ _ = $4!_0$ = 24
S A _ _ _ = $3!_0$ = 6
S M _ _ _ = $3!_0$ = 6
S N _ _ _ = $3!_0$ = 6
S U A _ _ = $2!_0$ = 2
S U M A N = $1!_0$ = 1

93rd Position

→ Position Of Word ANKIT in dictionary

Step - I → ~~A I K N T~~

→ A I _ _ _ = 3! = 6
A K _ _ _ = 3! = 6
A N I _ _ = 2! = 2
A N K I T = 1! = 1
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→ Position Of Word → VIMAL

Step - I → ~~A I L M V~~

→ A _ _ _ _ _ ⇒ 4!
→ I _ _ _ _ _ ⇒ 4!
→ L _ _ _ _ _ ⇒ 4!
→ M _ _ _ _ _ ⇒ 4!
→ V A _ _ _ ⇒ 3!
→ V I A _ _ ⇒ 2!
→ V I L _ _ ⇒ 2!
→ V I M A L ⇒ 1!

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→ Car Plate Problem :- Non Repetion