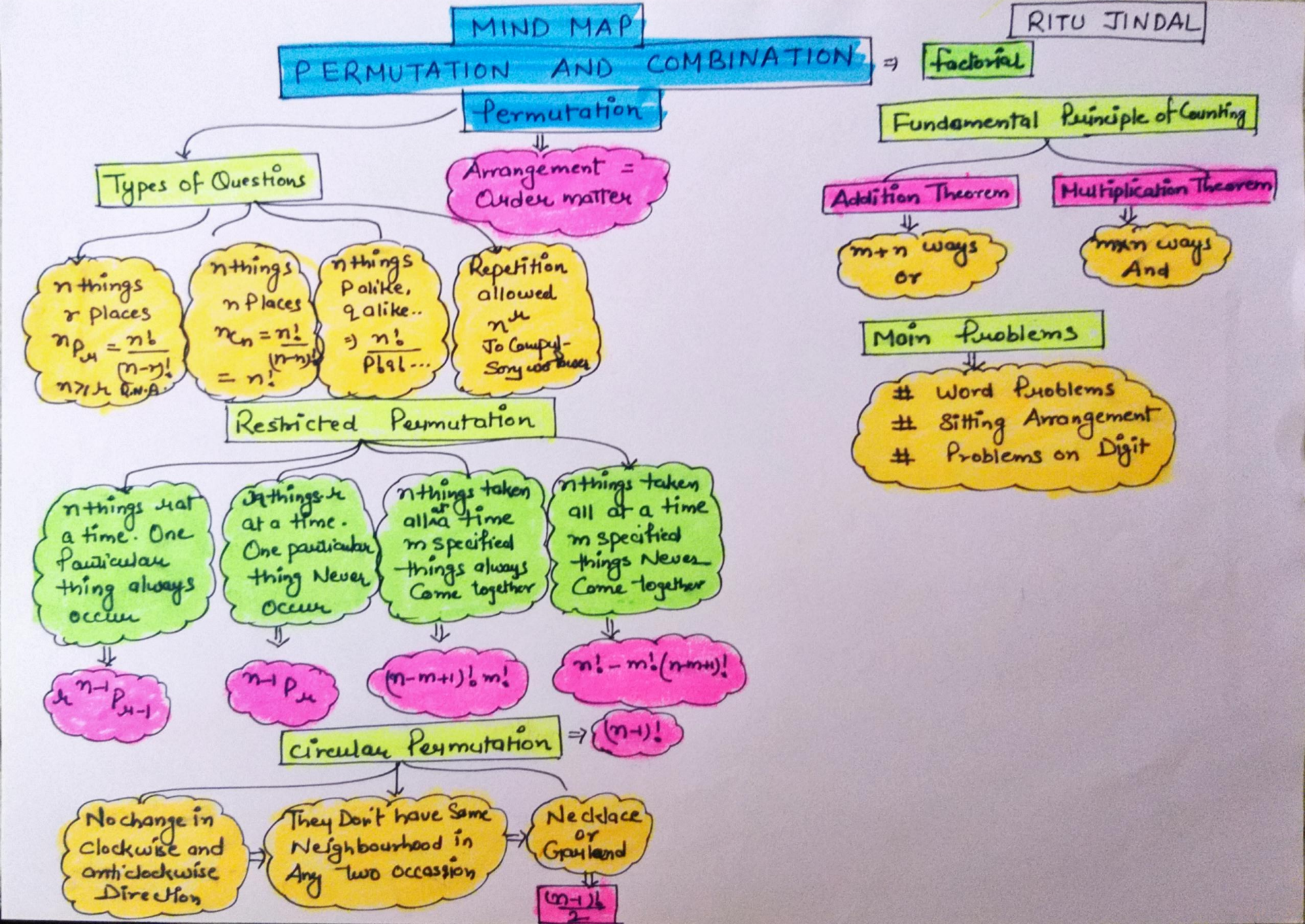
MIND MAP
PERMUTATION AND COMBINATION
RITU JINDAL
⇒ factorial
Permutation
Arrangement = Order matter
Types of Questions
n things r places
${}^{n}P_{r} = \frac{n!}{(n-r)!}$
n=r ${}^{n}P_{n} = n!$
n things n Places
${}^{n}C_{n} = \frac{n!}{(n-n)!}$
$= n!$
n things p alike, q alike..
$\Rightarrow \frac{n!}{p!q!\cdots}$
Repetition allowed
n^{n}
To Compute- Sony use buses
Restricted Permutation
n things not at a time. One Particular thing always occur
$r \cdot {}^{n-1}P_{r-1}$
n things at a time. One particular thing Never Occur
${}^{n-1}P_{r}$
n things taken all at a time
m specified things always Come together
$(n-m+1)! \cdot m!$
n things taken all at a time
m specified things Never Come together
$n! - m!(n-m+1)!$
Circular Permutation ⇒ $(n-1)!$
No change in clockwise and anticlockwise Direction
They Don't have Same Neighbourhood in Any two occassion
Necklace or Garland
$\frac{(n-1)!}{2}$
Fundamental Principle of Counting
Addition Theorem
m+n ways Or
Multiplication Theorem
m×n ways And
Main Problems
Word Problems
Sitting Arrangement
Problems on Digit

MIND MAP

PERMUTATION AND COMBINATION

RITU JINDAL

COMBINATION

Selection or Order Doesn't matter

Types of Questions

- n things Taken r at a time: $^nC_r = \frac{n!}{r!(n-r)!} = \frac{^nP_r}{r!}$
- n things Taken all at a time: $^nC_n = \frac{n!}{n!(n-n)!} = 1$
- n things taken r at a time 1 Particular always occur: $^{n-1}C_{r-1}$
- n things Taken r at a time 1 Particular Never occur: $^{n-1}C_r$

Some Important Results

- $^nC_r = {}^nC_{n-r}$
- $^nC_x = {}^nC_y$, $x = y$ or $x + y = n$
- $^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$
- $^nC_1 + {}^nC_2 + \dots {}^nC_n = 2^n - 1$ → One or More, Atleast One, Some or All

Geometrical Problems

- Straight Line
  - Simple: $^nC_2$
  - Collinear: $^nC_2 - {}^mC_2 + 1$
- Triangle
  - Simple: $^nC_3$
  - Collinear: $^nC_3 - {}^mC_3$
- Parallelogram: $^mC_2 \, {}^nC_2$
- No. of Diagonals: $^nC_2 - n$ or $\frac{n(n-3)}{2}$
- No of Chords: $^nC_2$

Some Important Points

Selected digits given Repetition Not allowed

Balls → Colour
- Permutation → Identical
- Combination → Different

Books → Subject → Different