Q 6 Newly married couple are in a Bday Party. IHMW 4 ppl can be selected that

A) they form No couple

$$^6C_4 \times {}^2C_1 \times {}^2C_1 \times {}^2C_1 \times {}^2C_1$$

B) there is exactly one couple

$$^6C_3 \times {}^3C_1 \times {}^2C_1 \times {}^2C_1$$

(C) Atleast one couple.

= 0 couple + Exactly 1 couple

$$= {}^6C_4 \times {}^2C_1 \times {}^2C_1 \times {}^2C_1 \times {}^2C_1 + {}^6C_3 \times {}^3C_1 \times {}^2C_1 \times {}^2C_1$$

Q No. of 7 digit No. if Sum of digit is 63.

(1) 9999999 $\Rightarrow \frac{7!}{7!} = 1$

(2) 6 2 हो जाए

9999998 $\Rightarrow \frac{7!}{6!} = 7$

(3) 61 हो जाए

9999988 या 9999997 $\rightarrow \frac{7!}{5!2!} = \frac{7 \cdot 6}{2} = 21$

$+$

$\frac{7!}{6!} = 7$

$= 21 + 7 = 28$

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(4) Sum 60

$9999888 = \frac{7!}{4!3!} = \frac{7\cdot6\cdot5}{6} = 35$

or.

+

$9999987 = \frac{7!}{5!} = 7\cdot6 = 42$

or.

$9999996 = \frac{7!}{6!} = 7$

84 Case

Q There are 10 Seats in Double Decker bus 6 in lower deck & 4 in Upper. Ten pessengers board the bus, 3 refuses to go to upperdeck & 2 insists for Upperdeck No of ways pess. can be accomodated.

$^4C_2 \times 2! \times {}^6C_3 \times 3! \times 5!$

Q An old man while dialing a 7 digit telephone No. rem. that first 4 digits consists of one 1's, one 2's & two 3's He also rem that 5th digit is either 4 or 5 While no memory for 6th digit, he rem. that 7th digit is 9 minus sixth digit

Maxm No. of distinct trials he has to try to dial correct No.

X X X X X ⊙ X

1 2 3 ↑ 4or5 $X_7 = 9 - X_6$

$\frac{4!}{2!} \times {}^2C_1 \times {}^{10}C_1 \times 1 = 12 \times 2 \times 10 = 240$

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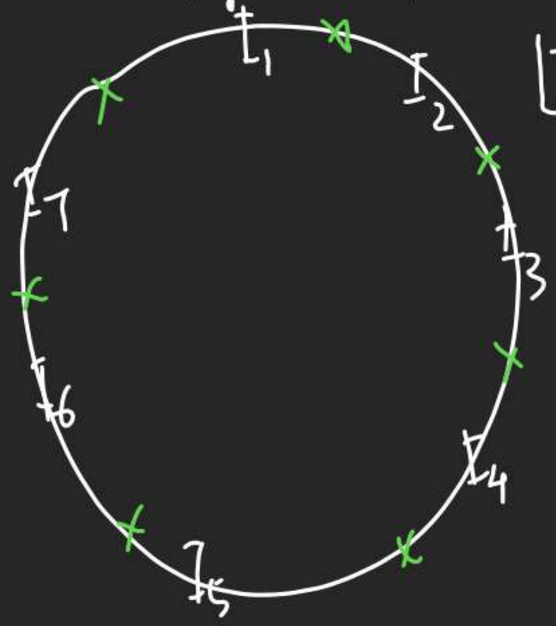
Circular Permutation.

of n different Object.

- taken all at a time
  - When A(N & C(N are different
    - NO(N) = (n-1)!
  - When A(N1 & C(N is Same.
    - (n-1)!/2
- taken r at a time.
  - (garland Necklace)
    - A(N ≠ C(N
      - n(r · (r-1)!
    - A(N = C(N
      - n(r × (r-1)!/2

Q How to arrange 7 American & 7 Indian ppl (an be seated on a Roundtable that No 2 americans are (onsecutive.

Gap Method



(7-1)! × 7!

↑ Indians

Betna chi

Q out of a 10 flowers of different colors. how many different garlands can be made. if each garland consists 6 flowers of different colors.

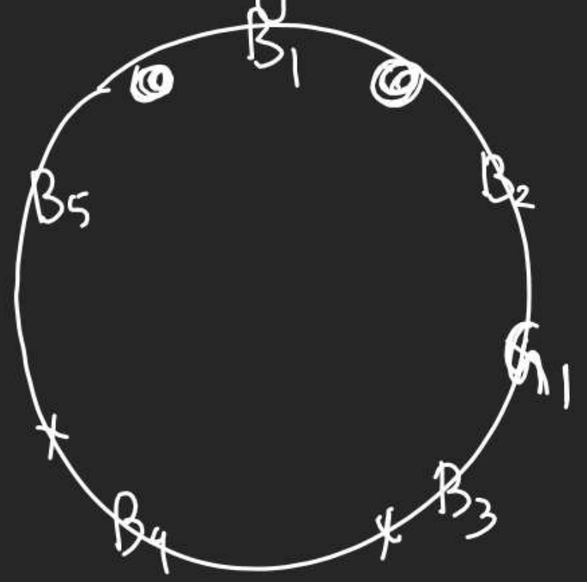
$$^{10}C_6 \times \frac{\lfloor 6-1}{2} = {}^{10}C_6 \times \frac{\lfloor 5}{2}$$

Q I H M N letters of word "TERRORISM" can be arranged in a Circle?

NOW: $\frac{\lfloor 9-1}{3!} = \frac{8!}{3!}$

Q NOW 5 boys & 5 girls can be seated on a Circle alternatively, if a Particular Boy & Girl are Never Adjacent.

$B_1 G_1$ — If da



$$\lfloor 5-1 \times {}^3C_1 \times 1 \times 4!$$

1st Boys are Sitting | B_1 के हर Remaining 3 places पे 1 | × Remaining 4 girls.

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** Imp fundamental

No. of ways r ppl out of n ppl are not consecutive in a Line $= {}^{n-r+1}C_r$

No. of ways when r ppl out of n ppl are not consecutive in a circle $= {}^{n-r+1}C_r - {}^{n-r-1}C_{r-2}$

Q) If n ppl are sitting on a circle, NOW in which 3 ppl are selected such that NO 2 of them are consecutive.

$${}^{n-3+1}C_3 - {}^{n-3-1}C_{3-2} = {}^{n-2}C_3 - {}^{n-4}C_1$$

RK

Selection from n DIFFerent thing

(1) No of ways to select atleast 1 thing out of n different things

$$^nC_1 + {}^nC_2 + {}^nC_3 + \cdots + {}^nC_n = 2^n - 1$$

(2) No of ways to Select or not Select atleast 1 thing out of n different thing

$$\underbrace{{}^nC_0} + \underbrace{{}^nC_1 + {}^nC_2 + {}^nC_3 + \cdots + {}^nC_n} = 2^n$$

(3) NO of ways to select atleast 1 object out of n Identical object.

$$^nC_1 + {}^nC_2 + {}^nC_3 + \cdots + {}^nC_n$$

$1 + 1 + 1 \cdots + 1 = n$ ways.

(4) No of ways to select or not select atleast 1 object out of n Identical object

$$\underline{1} + \underline{1 + 1 + 1 + \cdots + 1} = n + 1$$

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Q a^3b^2; 3 alike a & 2 alike b

then NOW

Q a^3b^2, 3 alike a & 2 alike b.

Then NOW to select atleast

1 object.

$(3+1)(2+1) - 1$ ← जो case जब Apple नहीं चुनी & Banana भी नहीं चुनी

$(3+1)$ ↓ 3 apple में से 1 भी Apple चुना नहीं चुना

$(2+1)$ ↓ 2 Banana में से 1 भी Banana चुना या नहीं चुना

Q $a^5b^4c^3$ alike

No of ways to select atleast one fruit.

$(5+1)(4+1)(3+1) - 1$

Q alike $a^5b^4c^3$ No of ways to select atleast one "a"

$(5)(4+1)(3+1) = 5 \times 5 \times 4$

Q alike $a^5b^4c^3$ NOW to select atleast one a & one b.

$= (5)(4)(3+1)$