

CHAP. 7

Permutations and Combinations
क्रमचयन

0 0 0 0 0 0 out

(3) selection
r =

$$\boxed{n P_r} = \frac{n!}{(n-r)!}$$

Factorial (!)

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

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

$$2! = 2 \times 1$$

$$\boxed{0! = 1}$$

(3 digit) No. digits are given $\boxed{1, 2, 3, 4, 5, 6, 7}$

digits repetition are allowed

$$\boxed{n^r}$$

repetition are not allowed.

$$\boxed{n P_r}$$

Ex-7.1

(3 digits)

(i) 1, 2, 3, 4, 5

(ii) repetition of digits is allowed.

$$\boxed{n^r} = 5^3 = 125$$

(iii) " " " is not " $\Rightarrow 5 P_3 = \frac{5!}{2!}$

$$Q \text{un } 6^3 = \boxed{216} \begin{cases} \text{even} \\ \downarrow \\ \text{odd} \end{cases}$$

$$= \frac{5 \times 4 \times 3 \times 2 \times 1}{\cancel{2!}} = \underline{\underline{60}}$$

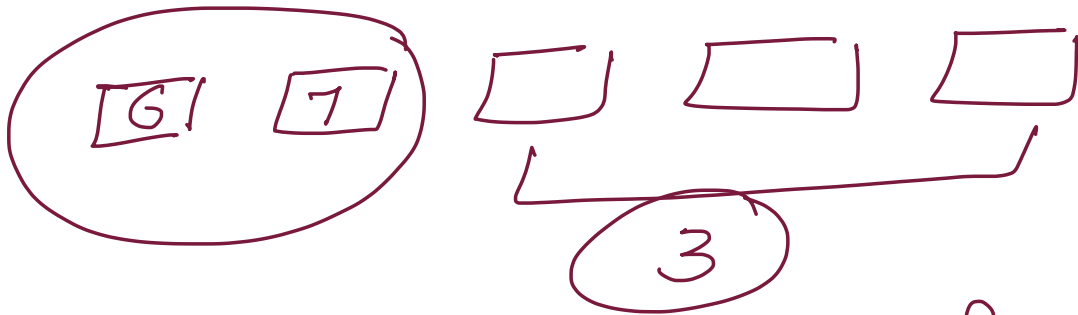
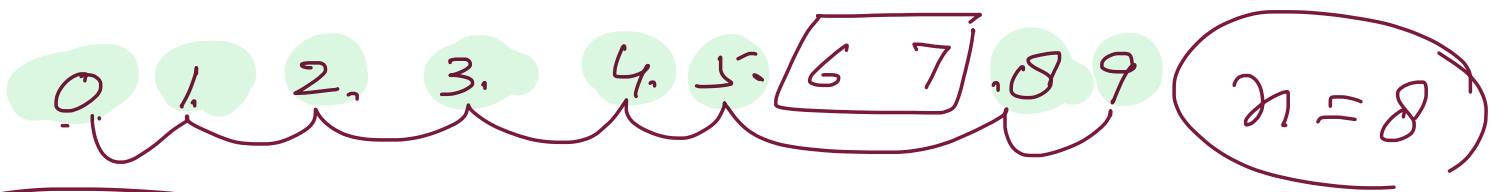
$$\underline{\underline{108}}$$

Que 3. $n = 10$ $r = 4$ $n P_r = 10 P_4$

$$\frac{n!}{(n-r)!} = \frac{10!}{6!} = \underline{\underline{5040}}$$

$$\frac{10 \times 9 \times 8 \times 7 \times \cancel{6!}}{\cancel{6!}}$$

Que 4.



Repetition not allowed

$$n P_r = 8 P_3 = \frac{8!}{5!}$$

$$\frac{n!}{(n-r)!} \Rightarrow \frac{8 \times 7 \times 6 \times \cancel{5!}}{\cancel{5!}}$$

$$\Rightarrow \underline{\underline{56 \times 6 = 336}}$$

Que 5.

Coin Tossed 3 Times



HH

TT

Repetition is allowed

allowed

$$\boxed{n = 2}$$

$$\underline{\underline{n^r}}$$

$$\boxed{2^3 = 8}$$

Que 6. one below other

repetition is not allowed

$$\textcircled{5P_2} = \frac{5!}{(5-2)!} = \frac{5!}{3!}$$

$$\Rightarrow \frac{5 \times 4 \times \cancel{3!}}{\cancel{3!}} = \underline{\underline{20}}$$

(Ex-7.2)

$$\textcircled{i} \quad 8! = 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = \underline{\underline{40320}}$$

$$\textcircled{ii} \quad 4! - 3! = \textcircled{1! \times}$$

$$4 \times 3 \times 2 \times 1 - 3 \times 2 \times 1$$

$$24 - 6$$

$$= \underline{\underline{18}}$$

Que 2 Do yourself.

$$\underline{\underline{\text{Que 4.}}} \quad \frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$$

$$\frac{1}{6!} + \frac{1}{7 \times 6!} = \frac{x}{8 \times 7 \times 6!}$$

$$\frac{1}{6!} \left(1 + \frac{1}{7} \right) = \frac{x}{8 \times 7 \times 6!}$$

$$\frac{8}{7} = \frac{x}{8 \times 7} \quad \boxed{x = 64}$$