

CLASS XI-MATHEMATICS

CHAPTER 7

PERMUTATIONS AND COMBINATIONS

HANDOUT OF MODULE-3/3

1. Combinations are the number of selections that can be made from a group of given objects without reference to the order of objects in that group .

2. If  $r$  objects are to be chosen out of  $n$  objects where the order of arrangements

is not important is given by the formula,

$$n_{c_r} = \frac{n!}{r!(n-r)!}, 0 \leq r \leq n$$

3. The relation between  $n_{p_r}$  and  $n_{c_r}$

is  $n_{p_r} = r! n_{c_r}, 0 < r \leq n$  .

4. The properties of  $n_{c_r}$  :

$$(i) n_{c_r} = n_{c_{n-r}}$$

$$(ii) n_{c_n} = n_{c_0} = 1$$

$$(iii) n_{c_x} = n_{c_y}, \text{ implies } x = y \text{ or } x + y = n$$

$$(iv) n_{c_r} + n_{c_{r-1}} = n + 1_{c_r}$$

5. The number of diagonals which can be drawn from a polygon of

$$n \text{ sides is } n_{c_2} - n.$$

6. The number of parallelograms which can be formed from a set of  $m$  parallel

lines intersecting another set of  $n$  parallel lines is  $m_{c_2} \times n_{c_2}$

7. The number of chords which can be drawn from 'n' points

on a circle is  $n_{C_2}$  .

8. Out of n points in a plane , if m points are collinear ,then the number of lines

obtained by joining these points in pairs is  $m_{C_2} - n_{C_2} + 1$  .

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