Binomial Theorem - Class XI

Related Questions with Solutions

Questions

Quetion: 01

In questions below, If C_0, C_1, C_2,..., C_n are the combinatorial coefficients in the expansion of $(1 + x)^n$, n⎣N, then

$C_0^2 + C_1^2 + C_2^2 + \ldots + C_n^2 =$

A. ${}^{2n}C_n$

B. ${}^{2n}C_{n-1}$

C. $\left({}^{2n}C_n\right)^2$

D. $\left({}^{2n}C_{n-1}\right)^2$

Solutions

Solution: 01

$[1 + x]^n = {}^nC_0 + {}^nC_1x + {}^nC_2x^2 + \ldots + {}^nC_nx^n$

$[x + 1]^n = {}^nC_0x^n + {}^nC_1x^{n-1} + \ldots + {}^nC_0$

multiply

$[1 + x]^{2n} = [{}^nC_0 + {}^nC_1x + \ldots + {}^nC_nx^n]\,[{}^nC_0x^n + \ldots + {}^nC_0]$

${}^nC_0^2 + {}^nC_1^2 + \ldots + {}^nC_n^2 =$ coefficient of x^n in $(1 + x)^{2n}$

$= {}^{2n}C_n$

Correct Options

Answer:01

Correct Options: A