Binomial Theorem - Class XI

Past Year JEE Questions

Questions

Quetion: 01

If the sum of the coefficients in the expansion of $(a+b)^n$ is 4096, then the greatest coefficient in the expansion is

A. 1594

B. 792

C. 924

D. 2924

Solutions

Solution: 01

Explanation

We know, $(a+b)^n = {}^nC_0.a^n + {}^nC_1.a^{n-1}.b + \ldots + {}^nC_n.b^n$

Remember to find sum of coefficient of binomial expansion we ave to put 1 in place of all the variable.

So put a = b = 1

$\therefore 2^n = {}^nC_0 + {}^nC_1 + {}^nC_2 \ldots + {}^nC_n$

According to question, $2^n = 4096 = 2^{12}$

$\Rightarrow n = 12$

So $(a+b)^n = (a+b)^{12}$

Here n = 12 is even so formula for greatest term is

$T_{\frac{n}{2}+1} = {}^nC_{\frac{n}{2}}.a^{\frac{n}{2}}.b^{\frac{n}{2}}$

For n = 12, greatest term $T_{6+1} = {}^{12}C_6.a^6.b^6$

$\therefore$ Coefficient of the greatest term = ${}^{12}C_6 = \frac{12!}{6!6!} = 924$