

Question -

Let $X = \binom{10}{1}^2 + 2\binom{10}{2}^2 + 3\binom{10}{3}^2 + \dots + 10\binom{10}{10}^2$,
where $\binom{10}{r}$, $r \in \{1, 2, \dots, 10\}$ denote binomial
coefficients. Then, the value of $\frac{1}{1430} X$ is
(2018 Adv.)

Solution -

Sum of coefficients is obtained by putting $x = 1$

i.e. $(1 + 1 - 3)^{2163} = -1$

Thus, sum of the coefficients of the polynomial
 $(1 + x - 3x^2)^{2163}$ is -1 .