

Question -

If the number of terms in the expansion of  $\left(1 - \frac{2}{x} + \frac{4}{x^2}\right)^n$ ,  $x \neq 0$ , is 28, then the sum of the coefficients of all the terms in this expansion, is

(2016 Main)

- (a) 64 (b) 2187  
(c) 243 (d) 729

Ans - D

Solution -

Clearly, number of terms in the expansion of

$$\left(1 - \frac{2}{x} + \frac{4}{x^2}\right)^n \text{ is } \frac{(n+2)(n+1)}{2} \text{ or } {}^{n+2}C_2.$$

[assuming  $\frac{1}{x}$  and  $\frac{1}{x^2}$  distinct]

$$\therefore \frac{(n+2)(n+1)}{2} = 28$$

$$\Rightarrow (n+2)(n+1) = 56 = (6+1)(6+2) \Rightarrow n = 6$$

$$\text{Hence, sum of coefficients} = (1 - 2 + 4)^6 = 3^6 = 729$$