

The coefficient of  $x^7$  in the expansion of  $(1 - ax)^{-7}$  is  $\frac{13!}{7!6!} 2^7$  then find the value of  $a$   
( $|ax| < 1$ )

**SOLUTION :**

we know that coefficient of  $t^r$  in the expansion  $(1-t)^{-n}$  is  $n + r - 1C_r$  therefore

Coefficient of  $(ax)^7$  in the expansion  $(1-ax)^{-7}$  is  $7 + 7 - 1C_7 = 13C_7$

therefore

$$a^7 13C_7 = \frac{13!}{7!6!} 2^7$$

$$a^7 = 2^7$$

$$a = 2$$