Ques. Let $n_1 < n_2 < n_3 < n_4 < n_5$ be positive integers such that $n_1 + n_2 + n_3 + n_4 + n_5 = 20$. Then the number of such distinct arrangements $(n_1, n_2, n_3, n_4, n_5)$ is (2014)

Sol. If n_1, n_2, n_3, n_4 take minimum values 1, 2, 3, 4 respectively then n_5 will be maximum 10.

$\Rightarrow n_5 = 10 \Rightarrow (n_1, n_2, n_3, n_4) = (1, 2, 3, 4)$

$n_5 = 9 \Rightarrow (n_1, n_2, n_3, n_4) = (1, 2, 3, 5)$

$n_5 = 8 \Rightarrow (n_1, n_2, n_3, n_4) = (1, 2, 3, 6)$

$\Rightarrow n_1, n_2, n_3, n_4) = (1, 2, 4, 4)$

i.e. 2 solution

For $n_5 = 7$, we can have

$n_1 = 1, n_2 = 1, n_3 = 4, n_4 = 6$

or $n_1 = 1, n_2 = 3, n_3 = 4, n_4 = 5$ i.e. 2 solutions

For $n_5 = 6 \Rightarrow (n_1, n_2, n_3, n_4) = (2, 3, 4, 5)$

$\Rightarrow$ Total 7 solutions