Permutation and Combination - Class XI

Related Questions with Solutions

Questions

Quetion: 01

Number of ways in which 15 indistinguishable oranges can be distributed in 3 different boxes so that every box R has atmost 8
oranges, are

A. 52
B. 108
C. 76
D. 28

Solutions

Solution: 01

Required ways = [Total possible ways without restriction]
- [ways when any box has nine or more oranges]

Total possible ways are:

$x + y + z = 15 \quad \Rightarrow \quad {}^{15+3-1}C_{3-1} = {}^{17}C_2$

Ways when any box can have 9 oranges

x + y + z = 15

Either one of x, y, z can have more than 9 oranges with ${}^{3}\mathrm{C}_{1}$ ways.

x + y + z = 15 – 9 = 6 with x ≥ 0, y ≥ 0, z ≥ 0

Number of ways are ${}^{3}\mathrm{C}_{1} \times {}^{6+3-1}\mathrm{C}_{3-1} = {}^{3}\mathrm{C}_{1} \times {}^{8}\mathrm{C}_{2}$

Required ways are $= {}^{17}\mathrm{C}_{2} - {}^{3}\mathrm{C}_{1} \times {}^{8}\mathrm{C}_{2} = 52$

Correct Options

Answer:01

Correct Options: A