



Permutations Ex 16.2 Q46

Total number of ball =  $n = 5$

Number of boxes =  $r = 3$

5 different balls can be distributed among three boxes in  ${}^5P_3$  ways.

$${}^5P_3 = \frac{5!}{(5-3)!} = \frac{5!}{2!} = \frac{5 \times 4 \times 3 \times 2 \times 1}{2 \times 1} = 60.$$

In 60 ways 5 different balls can be distributed among three boxes.

Permutations Ex 16.2 Q47(i)

4 prizes be distributed among 5 students so that no student gets more than one prize can be done in

$${}^5P_4 = \frac{5!}{(5-4)!} = \frac{5!}{(1)!} = 5! \text{ ways.}$$

Permutations Ex 16.2 Q47(ii)

The first prize can be given away in 5 ways as it may be given to anyone of the 5 students.

The second prize can also be given away in 5 ways, since it may be obtained by the student who has already received a prize. Similarly, third and fourth prize can be given away in 5 ways.

Hence, the number of ways in which all the prize can be given away =  $5 \times 5 \times 5 \times 5 = 625$

Permutations Ex 16.2 Q47(iii)

Since any of the 5 students may get all the prizes. So, the number of ways in which a student gets all the 4 prizes is 5.

So, the number of ways in which a student does not get all the prizes =  $625 - 5 = 620$

Permutations Ex 16.2 Q48

Each lamp has two possibilities either it can be switched on or off.

There are 10 lamps in the hall.

So the total numbers of possibilities are  $2^{10}$ .

To illuminate the hall we require at least one lamp is to be switched on.

There is one possibility when all the lamps are switched off. If all the bulbs are switched off then hall will not be illuminated.

So the number of ways in which the hall can be illuminated is  $2^{10}-1$ .

\*\*\*\*\* END \*\*\*\*\*