Permutations Ex 16.3 Q15

The total number of ways

$= \text{Number of arrangements of 5 things, taken all at a time} = {}^{5}P_{5}$

$= \frac{5!}{(5-5)!}$

$= \frac{5\times4\times3\times2\times1}{0!} \qquad [\because\ 0! = 1]$

$= 120$

Hence, the total number of ways in which children stand in a queue is 120.

Permutations Ex 16.3 Q16

The total number of teachers in a school = 36

One principal and one uice-principal are to be appointed.

$\therefore$ Total of ways

= Number of arrangement of 36 things taken two at a time

$= {}^{36}P_{2}$

$= \frac{36!}{(36-2)!}$

$= \frac{36!}{34!}$

$= \frac{36\times35\times34!}{34!}$

$= 36\times35$

$= 1260$

Hence, Total number of ways to oppoint one principal and one vice-principal are 1260.

Permutations Ex 16.3 Q17

Total number of letters = 4

$\therefore$ The total number of ordred

paris = Number of arrangements of 4 letters, taken two at a time

$= {}^{4}P_{2}$

$= \frac{4!}{(4-2)!}$

$= \frac{4!}{2!}$

$= \frac{4\times3\times2!}{2!}$

$= 12$

Hence, the total number of ordered paris = 12

Permutations Ex 16.3 Q18

Total number of books = 4

$\therefore$ Total number of ways

= Number of arrangments of 4 books, taken all at a time

$= {}^{4}P_{4}$

$= \frac{4!}{(4-4)!} \qquad \left[\because {}^{n}P_{r} = \frac{n!}{(n-r)!}\right]$

$= \frac{4!}{0!}$

$= 4! \qquad [\because 0! = 1]$

$= 4 \times 3 \times 2 \times 1$

$= 24$

Hence, the total number of ways to arrange the books in a shelf = 24

********** END **********