## Combinations Ex 17.3 Q6

There are $x$ things

Two specific things are to occur together, so remaining things are $(r-2)$.

Now, number of ways to arrange $(r-2)$ things out of $(n-2) = {}^{(n-2)}P_{(r-2)}$

Two things can be arranged is $(r-1)$ ways.

and these two can be placed in 2 ways.

Therefore,

Required number of ways $= 2(r-1)\,{}^{(n-2)}P_{(r-2)}$

## Combinations Ex 17.3 Q7

The given word is P R O P O R T I O N.

Total letters = 10

Number of P = 2, Number of R = 2

Number of O = 3, Number of T = 1

Number of I = 1, Number of N = 1

(i) Case I: There are 6 different letters is which all the four are distirct to selected.

Number of ways to select therefour $= {}^{6}C_{4}$

$= 15$

Case II: Two same and two distirct letters are selected there are three pairs which more than, letters.

Number of ways to select therefour

$= {}^{3}C_{1} \times {}^{5}C_{2}$

$= 3 \times 10$

$= 30$

Case III: Two alike of one kind and two alike of other kind.

There are 3 pairs of letters is the more than one letters. Any 2 of these 3 letters.

Number of ways to select these letters

$= {}^{3}C_{2}$

$= 3$

Case IV: Three alike and one dofferent.

Number of ways to select these letters

$= 1 \times {}^{5}C_{1}$

$= 5$

Therefore,

Number of ways to select four letters

$= 15 + 30 + 3 + 5$

$= 53$

Required number of ways to select = 53

(ii) For case I:

Number of arrangements of four letters all distirct = $^6C_4 \times 4!$

$= 15 \times 24$

$= 360$

For case II:

Number of arrangements of four letters two same kind and two of different kind

$= {}^3C_1 \times {}^5C_2 \times \frac{4!}{2!1!1!}$

$= 3 \times 10 \times 12$

$= 360$

For case III:

Number of arrangements of four letters two alike of one kind and two of other kind

$= {}^3C_2 \times \frac{4!}{2!2!}$

$= 3 \times 6$

$= 18$

Case IV:

Number of arrangements of four letters 3 alike and 1 other kind

$= 1 \times {}^5C_1 \times \frac{4!}{3!1!}$

$= 20$

Therefore,

Total number of arrangements of four letters selected $= 360 + 360 + 18 + 20$

Required number of arrangement $= 758$

## Combinations Ex 17.3 Q8

M O R A D A B A D

Number of M = 1, Number of O = 1

Number of R = 1, Number of A = 3

Number of D = 2, Number of B = 1

(i) $\frac{\text{Four distirct letters}}{\text{There are 6 letters}}$

Number of arrangement of 4 letters

selected from these 6 = $^6C_4 \times 4!$

$= 15 \times 24$

$= 360$

(ii) Two alike and two different letters

There are 2 pairs with more than one

So, one pair from these and 2 from letters from rest 5 letters.

Number of ways to arrange therefour

$= {}^2C_1 \times {}^5C_2 \times \frac{4!}{2!}$

$= 2 \times 10 \times 12$

$= 240$

(iii) Two alike and two alike of other kinds.

Number of ways to arrange therefour

$= {}^2C_2 \times {}^5C_2 \times \frac{4!}{2!2!}$

$= 6$

(iv) There alike and one different number of ways to arrange therefour

$= 1 \times {}^5C_1$

$= 5 \times \frac{4!}{3!1!}$

$= 20$

Therefore,

Required number of ways $= 240 + 360 + 6 + 20$

Required number ways $= 626$

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