

Combinations Ex 17.3 Q9

In one round table the business man can accommodate the guests in $^{21}C_{15}$ ways. In the second round table he can accommodate the guests in $^{6}C_{6}$ ways. Keeping one guest as fixed in the first round table, the other 14 guests can be arrange in 14! ways. Keeping one guest as fixed in the second round table, the other 5 guests can be arrange in 5! ways.

Therefore the total number of ways in which the guests can be arrange is = ${}^{21}C_{15} \times {}^{6}C_{8} \times 14 \times 5!$ ways

Combinations Ex 17.3 Q10

The word EXAMINATION has letters E,X,A,M,I,N,T,O where A,I,N repeat twice.

: The total number of letter = 11

The number of ways of selecting 4 letters.

$$\Rightarrow^{11}C_4 = \frac{11!}{4! \ 7!} = \frac{11 \times 10 \times 9 \times 8}{4 \times 3 \times 2}$$

= 330.

The number of arranging 4 letters

a) All different
$${}^{8}C_{4} \times 4! = {}^{8}P_{4} = \frac{8!}{4!}$$

= $8 \times 7 \times 6 \times 5$
= 56×30
= 1680

b) 2 distinct and 2 alike

$$= {}^{3}C_{1} \times {}^{7}C_{2} = \frac{3 \times 7 \times 6}{2} = 63 \times \frac{4!}{2!}$$
$$= 378$$

c) 2 alike of one kind and 2 alike of other kind

$${}^{3}C_{2} \times \frac{4!}{2! \ 2!} = 3 \times 6 = 18$$

d) 3 alike and 1 distinct letter

$${}^{3}C_{1} \times {}^{7}C_{2} = \frac{3 \times 7 \times 6}{2} = 378$$

∴ Total number of ways in which 4 letter words are formed = 1680 + 378 + 18 + 378 = 2454 ways

Combinations Ex 17.3 Q11

Condition on specific persons = 4 and 2 = 6

Remaining people=16-6=10

So lets fill 8 people on both sides first from these 10.

First side, we can select 4 out of 10.

$$^{10}\text{C}_4 \times ^6\text{C}_6$$

Now we can arrange these 8 people on both sides in 81×8! ways

$$Answer={}^{10}C_4 \times {}^6C_6 \times 8! \times 8!$$

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