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Exercise # 7.3

Circular permutation

$$= \binom{n}{n_1 \; n_2 \; n_3}$$

$$= \frac{n!}{n_1!\, n_2!\, n_3!}$$

Question Number 01:

(I)

PAKISTAN

Solve:

Total No of letters $= n = 8$

P repeats = 1
A repeats = 1
K repeats = 1
I repeats = 1
S repeats = 1
T repeats = 1
A repeats = 1
N repeats = 1

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So:

Total no. of arrangements $= \binom{8}{1\,2\,1\,1\,1\,1\,1}$

$$= \frac{8!}{1!\,2!\,1!\,1!\,1!\,1!\,1!}$$

$$= \frac{40320}{(1)(2)(1)(1)(1)(1)(1)}$$

$$= \frac{40320}{2}$$

$$= 20160$$

(IV)

CURRICULUM

Solve:

Total no of letter $= n = 10$

C Repeats = 2

U Repeats = 3

R Repeats = 2

I Repeats = 1

L Repeats = 1

M Repeats = 1

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Total no of arrangement $= \binom{10}{2\ 3\ 2\ 1\ 1\ 1}$

$= \frac{10!}{2!\ 3!\ 2!\ 1!\ 1!\ 1!}$

$= \frac{3628800}{(2)(6)(2)(1)(1)(1)}$

$= \frac{3628800}{24}$

$= 15120$

(III)

PROBABILITY

Solve:

Total no of letter = n = 11

P Repeats = 1

R Repeats = 1

O Repeats = 1

B Repeats = 2

A Repeats = 1

I Repeats = 2

L Repeats = 1

T Repeats = 1

Y Repeats = 1

Date:_____ Day:_____

Total no of arrangement = $\binom{11}{1\ 1\ 2\ 1\ 2\ 1\ 1\ 1}$

$$= \frac{11!}{1!\ 1!\ 1!\ 2!\ 1!\ 2!\ 1!\ 1!\ 1!}$$

$$= \frac{39916800}{(1)(1)(1)(2)(1)(2)(1)(1)(1)}$$

$$= \frac{39916800}{4}$$

$$= 9979200$$

Date: Day:

Question-03

As:

TRIGONOMETRY

Solves-

We have to find no of arrangements of TRIGONOMETRY

Total number of letter is = n = 10

R. Repeats = 2

I Repeats = 1

G Repeats = 1

O Repeats = 2

N Repeats = 1

M Repeats = 1

E Repeats = 1

So

Total number of arrange ment =

$$\left(\frac{10}{2\ 1\ 1\ 2\ 1\ 1\ 1\ 1}\right)$$

$$= \frac{10!}{2!\ 1!\ 1!\ 2!\ 1!\ 1!\ 1!\ 1!}$$

$$= \frac{3628800}{(2)(1)(1)(2)(1)(1)(1)(1)}$$

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$$= \frac{362880}{4}$$

$$= 907200$$

Question - 04

Total no of marbles = n = 9

red marbles repeats = 4

blue marbles repeats = 3

Green marbles repeats 2

Sol:

Total numbers of arrangements

$$= \binom{9}{4\ 3\ 2}$$

$$= \frac{9!}{4!\,3!\,2!}$$

$$= 1260$$

Question-05

(I)

8 Person

Total no of person = n = 8

So:

Total no of arrangement = (n-1)!

= (8-1)!

= 7!

= 5040

(II)

7 Person

Total no of Person = n = 7

So:

Total no of arrangement = (n-1)!

= (7-1)!

= 6!

= 720

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(iii)

Total no of person = n = 6

So

Total no of arrangement = (n-1)!

= (n-1)!

= (6-1)!

= 5!

= 120

Question-06

Total no of person = n = 10

No of woman = 5

No of man = 5

Total no of arrangement when

1- man is fixed

$= {}^{4}P_{4} \times {}^{5}P_{5}$

$= 24 \times 120$

$= 2880$

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Question-10

Q = 10

Total no. of offices = n = 14

So

No of arrange 14 officer when 1 of then is fix = (n-1)!

= (14-1)!

= (13)!

= 13!

Question-08

Total no of members = n = 15

No. of arrangement is 1st commitee = $^{3}P_{3} = 3!$

" " " 2nd = $^{5}P_{5} = 5!$

" " " 3rd = $^{4}P_{4} = 4!$

" " " 4th " " = $^{3}P_{3} = 3!$

Now:

Total no of commitee formed by these members are =

$$= \binom{15}{3\ \ 5\ \ 4\ \ 3}$$

$$= \left(\frac{15!}{3!\ 5!\ 4!\ 3!}\right)$$

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$$\frac{15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5!}{3!\ 5!\ 4!\ 3!}$$

$$= \frac{15 \cdot 14 \cdot 13 \cdot \overset{2}{\cancel{12}} \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot \cancel{6}}{(\cancel{6})(24)(\cancel{6})}$$

$$= \frac{15 \cdot 14 \cdot 13 \cdot 2 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7}{24}$$

$$= 12612600$$

Question-09

Total no of D.C.O's $= n = 11$

When two D.C.O's is fixed then no of D.C.O's $= 10$

So

No of arrangement are $= (n-1)! \times 2$

$= (10-1)! \times 2$

$= 9! \times 2$

$= 725760$

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Question-011

Total no. of man = 9

Total no. of woman = 10

No, of arrangment of two around of different of around table = (9-1)! x (5-1)!

= 8! x 4!

= 40320 x 24

= 967680

Question-012

Total no. of man = 5

Total no. of woman = 5

No. of arrangement of two around of different of around table = (5-1)! x (5-1)!

= 4! x 4!

= 24 x 24

= 2880

Question-013

Total no. of keys = 8

So,

Total no. of keys is 8 when 1 key is arrangement is fixed

$= {}^7P_7$

$= 5040$

Question-014

Total no. of colours of necklaces = 10

total no. of colour 10 when 1 colour of arrangement in fixed

$= {}^9P_9$

$= 362880$