Permutations Ex 16.3 Q23

Let, w_1, w_2, w_3 and w_4 be 4 words, where w_1, w_2 have 3 volumes each and w_3, w_4 have 2 volume each.

These 4 works can be arranged in 4! ways.

Now,

volumes of w_1 can be arranged in 3! ways.
volumes of w_2 can be arranged in 3! ways.
volumes of w_3 can be arranged in 2! ways.
And volumes of w_4 can be arranged in 2! ways

$\therefore$ Total number of ways to arrange
all books $= 4!(3! \times 3! \times 2! \times 2!)$
$= 24 \times 6 \times 6 \times 2 \times 2$
$= 3456.$

Permutations Ex 16.3 Q24

There are 6 items in column A and 6 items in column B.

Now,

Each answer to the given question is an arrangement of the 6 items of column B keeping the order of items in column A fixed.

Hence, the total number of answers
= Number of arrangements of 6 items in column B

$= {}^{6}P_{6}$

$= \frac{6!}{(6-6)!}$

$= \frac{6!}{0!}$

$= 6 \times 5 \times 4 \times 3 \times 2 \times 1 \qquad [\because 0! = 1]$

$= 720$

Permutations Ex 16.3 Q25

Total number of digits = 10

Total number of 3 digit numbers $= {}^{10}P_{3}$

But these arrangements also include those numbers which have 0 at hundred's place.
such numbers are not 3-digit numbers.
When 0 is fixed at hundred's place, we have to arrange remaining 9 digits by taking 2 at a time.

The number of such arrangements is ${}^{9}P_{3}$.

So, the total of numbers having 0 at hundred's place $= {}^{9}P_{2}$

Hence, total number of 3 digit numbers which distinct $= {}^{10}P_{3} - {}^{9}P_{2}$

$= \frac{10!}{(10-3)!} - \frac{9!}{(9-2)!}$

$= \frac{10!}{7!} - \frac{9!}{7!}$

$= \frac{10 \times 9 \times 8 \times 7!}{7!} - \frac{9 \times 8 \times 7!}{7!}$

$= 720 - 72$

$= 648.$

Permutations Ex 16.3 Q26

Total number of digits = 10

The first two digits of telephone is 35 and no digit appears more than once.

$\therefore$ Total number of remaining digits = 10 – 2 = 8
And, Total number of remaining digits of telephone number = 6 – 2 = 4.

$\therefore$ Required number of telephone numbers $= {}^{8}P_{4}$

$$= \frac{8!}{(8-4)!}$$

$$= \frac{8!}{4!}$$

$$= \frac{8 \times 7 \times 6 \times 5 \times 4!}{4!}$$

$$= 1680$$

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