DPP
DAILY PRACTICE PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. :10

Topic :-PERMUTATIONS AND COMBINATIONS

1 **(d)**

In the word RAHUL the letters are (A, H, L, R, U)

Number of words starting with A = 4! = 24

Number of words starting with H=4! = 24

Number of words starting with L = 4! = 24

In the starting with R first one is RAHLU and next one is RAHUL.

$\therefore$ Rank of the word RAHUL = 3(24) +2 = 74

2 **(a)**

The required natural numbers consist of 4 digits, 3 digits, 2 digits and one digit so that their number is equal to

$9 \cdot 9 \cdot 8 \cdot 7 + 9 \cdot 9 \cdot 8 + 9 \cdot 9 + 9 = 5274$

3 **(a)**

We have 26 letters (a to z) and 10 digits (0 to 9). The first three places can be filled with letters in $^{26}P_3$ ways and the remaining 2 places can be filled with digits $^{10}P_2$ ways. Hence, the number of ways in which the code word can be made

$= \left(^{26}C_3 \times 3\,!\right) \times \left(^{10}C_2 \times 2\,!\right) = 1404000$

4 **(c)**

The first digit a can take any one of 1 to 8

The third digit c can take any one of 0 to 9

When $a = 1$, b can take any one of 2 to 9=8 values

When $a = 2$, b can take any one of 3 to 9=7 values

When $a = 3$, b can take any one of 4 to 9=6 values

$\dots \quad \dots \quad \dots \quad \dots$

$\dots \quad \dots \quad \dots \quad \dots$

When $a = 8$, b can take any one $(b = 9) = 1$ values Thus, the number of total numbers

$$= (8 + 7 + 6 + ... + 2 + 1) \times 10 = \frac{8 \times 9}{2} \times 10 = 360$$

5 **(c)**

Since, out of eleven members two numbers sit together, then the number of arrangements $= 9! \times 2$

($\because$ Two numbers can be sit in two ways)

6 **(c)**

There are 4 odd places and there are 4 odd numbers viz. 1, 1, 3, 3. These, four numbers can be arranged in four places in

$\frac{4!}{2!2!} = 6$ ways

In a seven digit are 3 even places namely 2nd, 4^{th} and 6^{th} in which 3 even numbers 2, 2, 4 can be arranged in $\frac{3!}{2!} = 3$ ways

Hence, the total number of numbers $= 6 \times 3 = 18$

7 **(d)**

The number of words starting from E are =5!=120

The number of words starting from H are =5!=120

The number of words starting from ME are=4!=24

The number of words starting from MH are=4!=24

The number of words starting from MOE are =3!=6

The number of words starting from MOH are =3!=6

The number of words starting from MOR are =3!=6

The number of words starting from MOTE are =2!=2

The number of words starting from MOTHER are =1!=1

Hence, rank of the word MOTHER

$= 2(120) + 2(24) + 3(6) + 2 + 1$

$= 309$

8 **(c)**

(1) Total number of ways of arranging m things $= m!$ To find the number of ways in which p particular things are together, we consider p particular thing as a group.

$\therefore$ Number of ways in which p particular things are together $= (m - p + 1)!p!$

So, number of ways in which p particular things are not together

$= m! - (m-p+1)!p!$

(2) Each player shall receive 13 cards.

Total number of ways $= \frac{52!}{(13!)^4}$

Hence, both statements are correct

9 **(d)**
Now, 770=2.5.7.11

We can assigned 2 to $x_1$or $x_2$or x_3 or x_4. That is 2 can be assigned in 4 ways.

Similarly each of 5, 7 or 11 can be assigned in 4 ways.

$\therefore$ Required number of ways $= 4^4 = 256$

10 **(c)**
There are five seats in a bus are vacant. A man sit on any one of 5 seats in 5 ways. After the man is seated his wife can be seated in any of 4 remaining seats in 4 ways.
Hence, total number of ways of seating them $= 5 \times 4 = 20$
11 **(c)**
Required number $= {}^9C_5 - {}^7C_3 = 91$
12 **(b)**
Since, there are n distinct points on a circle.

For making a pentagon it requires a five points

According to given condition

${}^nC_5 = {}^nC_3 \Rightarrow n = 8$

13 **(b)**
The total number of ways $= 6^4 = 1296$
$\therefore$ required number of ways
=1296-(none of the number shows 2)
$= 1296 - 5^4 = 671$
14 **(c)**
Required number of ways
$= {}^{11}C_5 - {}^{11}C_4$
$$= \frac{11!}{5!6!} = \frac{11!}{4!7!} = 132$$
15 **(d)**
There are $(m+1)$ choices for each of n different books. So, the total number of choice is $(m+1)^n$ including one choice in which we do not select any book.
Hence, the required number of ways is $(m+1)^n - 1$

16 **(b)**
There are 6 letters in the word 'MOBILE'. Consequently, there are 3 odd places and 3 even places. Three consonants M,B and L can occupy three odd places in $3\,!$ ways. Remaining three places can be filled by 3 vowels in $3\,!$ ways.
Hence, required number of words $= 3\,! \times 3\,! = 36$
17 **(b)**
As the seats are numbered so the arrangement is not circular
Hence, required number of arrangements $= {}^nC_m \times m\,!$
18 **(d)**
Two circles can intersect at most in two points. Hence, the maximum number of points of intersection is ${}^8C_2 \times 2 = 56$
19 **(b)**
There are two cases arise

Case I They do not invite the particular friend

$= {}^8C_6 = 28$

Case II They invite one particular friend

$= {}^8C_5 \times {}^2C_1 = 112$

$\therefore$ Required number of ways =28+112=140

20 **(d)**
The consonants can be arranged in 4! ways, and the vowels in $\frac{3\,!}{2\,!}$ ways
So, the required number of arrangements $= \frac{4\,!\,3\,!}{2}$

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	D	A	A	C	C	C	D	C	D	C
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	B	B	C	D	B	B	D	B	D