MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 69

Total Marks :

Max. Time : min.

Topic : Permutation and Combination

REVISION DPP ON PERMUTATION AND COMBINATION

1. (i) Find the number of four letter word that can be formed from the letters of the word HISTORY. (each letter to be used at most once)
(ii) How many of them contain only consonants?
(iii) How many of them begin & end in a consonant?
(iv) How many of them begin with a vowel?
(v) How many contain the letters Y? (vi) How many begin with T & end in a vowel?
(vii) How many begin with T & also contain S? (viii) How many contain both vowels?

2. How many natural numbers are there from 1 to 1000 which have none of their digits repeated.

3. If all letters of the word " VARUN" are written in all possible ways and then are arranged as in a dictionary, then the rank of the word VARUN is :
(A) 98 (B) 99 (C) 100 (D) 101

4. In how many ways can 5 letters be mailed if there are 3 mailboxes available if each letter can be mailed in any mailbox. (Repetition allowed)

5. In how many ways four persons can be accommodated in 3 different chairs if each person can occupy only one chair. Also find number of ways in which three persons can accomodate in 4 chairs.

6. The number of ways in which 7 letters can be put in 7 envelopes such that exactly four letters are in wrong envelopes is
(A) 300 (B) 315 (C) 325 (D) 1035

7. In a telephone system four different letter P, R, S, T and the four digits 3, 5, 7, 8 are used. Find the maximum number of "telephone numbers" the system can have if each consists of a letter followed by a four-digit number in which the digit may be repeated.

8. It is required to seat 5 men and 4 women in a row so that the women occupy the even places. How many such arrangements are possible?

9. An ice cream parlour has ice creams in eight different varieties. Number of ways of choosing 3 ice creams taking atleast two ice creams of the different variety, is :
(A) 56 (B) 112 (C) 100 (D) none
(Assume that ice creams of the same variety are identical & available in unlimited supply)

10. A women has 11 close friends. Find the number of ways in which she can inivite 5 of them to dinner, if two particular of them are not on speaking terms & will not attend together.

11. Distinct 3 digit numbers are formed using only the digits 1, 2, 3 and 4 with each digit used at most once in each number thus formed. The sum of all possible numbers so formed is
(A) 6660 (B) 3330 (C) 2220 (D) none

12. There are 2 identical white balls, 3 identical red balls and 4 green balls of different shades. The number of ways in which they can be arranged in a row so that atleast one ball is separated from the balls of the same colour, is :
(A) 6 (7 ! – 4!) (B) 7 (6 ! – 4 !) (C) 8 ! – 5 ! (D) none

13. The number of noncongruent rectangle that can be formed on a chessboard, is
(A) 30 (B) 32 (C) 33 (D) 36

14. There are 6 boxes numbered 1, 2,.....6. Each box is to be filled up either with a red or a green ball in such a way that at least 1 box contains a green ball and the boxes containing green balls are consecutive. The total number of ways in which this can be done, is
(A) 21 (B) 33 (C) 60 (D) 6

15. Find the number of different permutations of the letters of the word "BOMBAY" taken four at a time. How would the result be affected if the name is changed to "MUMBAI". Also find the number of combinations of the letters taken 3 at a time in both the cases.

16. Find the number of 10 digit numbers using the digits 0, 1, 2,.....9 without repetition. How many of these are divisible by 4.

17. Six married couple are sitting in a room. Find the number of ways in which 4 people can be selected so that
(A) they do not form a couple (B) they form exactly one couple
(C) they form at least one couple (D) they form atmost one couple

18. The number of ways in which 14 men be partitioned into 6 committies where two of the committies contain 3 men & the other contain 2 men each is :

(A) $\frac{14!}{(3!)^2(2!)^4}$ (B) $\frac{14!}{(3!)^2(2!)^5}$ (C) $\frac{14!}{4!(3!)^2.(2!)^4}$ (D) $\frac{14!}{(2!)^5.(3!)^2.4!}$

19. The number of ways in which 8 non-identical apples can be distributed among 3 boys such that every boy should get atleast 1 apple & atmost 4 apples is K. ${}^7P_3$ where K has the value equal to :
(A) 88 (B) 66 (C) 44 (D) 22

20. Delegates of the five of the member countries of SAARC decide to hold a round table conference. There are 5 Indians, 4 Bangladeshis, 4 Pakistanis, 3 Sri Lankans and 3 Nepales. In how many ways can they be seated ? In how many ways can they be seated, if those of the same nationality sit together ?

21. How many necklace of 11 beads each can be made from 23 beads of various colours ?

(A) $\frac{1}{22}\left(\frac{23!}{12!}\right)$ (B) $\frac{23!}{12!}$ (C) $\left(\frac{23!}{2.12!}\right)$ (D) none of these

22. Given 11 points, of which 5 lie on one circle, other than these 5, no 4 lie on one circle. Then the maximum number of circles that can be drawn so that each contains atleast three of the given points is :
(A) 216 (B) 156 (C) 172 (D) none

23. How many ways are there to seat n married couples ($n \geq 3$) around a table such that men and women alternate and each women is not adjacent to her husband.

24. The number of positive integral solutions of the equation $x + y + z + w = 19$ is equal to
(A) the number of ways in which 15 identical things can be distributed among 4 persons.
(B) the number of ways in which 19 identical things can be distributed among 4 persons.
(C) coefficients of x^{19} in $(x^0 + x^1 + x^2 + ... + x^{19})^4$
(D) coefficients of x^{19} in $(x + x^2 + x^3 + ... + x^{19})^4$

25. A man wants to distribute 101 coins of a rupee each, among his 3 sons with the condition that no one receives more money than the combined total of other two. The number of ways of doing this is :

(A) ${}^{103}C_2 - 3{}^{52}C_2$ (B) $\frac{{}^{103}C_2}{3}$ (C) 1275 (D) $\frac{{}^{103}C_2}{6}$

26. The number of combination of 16 things, 8 of which are alike and the rest different, taken 8 at a time is___

27. Number of divisors of $N = 2^7 . 3^3 . 5^4$ divisible by 6 but not by 15 is
(A) 24 (B) 21 (C) 30 (D) 60

28. Number of divisors of 240 in the from $4n + 2$ ($n \geq 0$) is equal to
(A) 4 (B) 8 (C) 10 (D) 3

29. If $N = 2^{p-1}.(2^p - 1)$, where $2^p - 1$ is a prime, then the sum of the divisors of N expressed in terms of N is equal to _____

30. Exponent of 12 in 100! is
(A) 24 (B) 48 (C) 54 (D) 36

Answers Key

1. (i) 840 ; (ii) 120 ; (iii) 400 ; (iv) 240 ; (v) 480 ;

(vi) 40 ; (vii) 60 ; (viii) 240 ;

2. 738 **3.** (C) **4.** 243 ways **5.** 24, 24

6. (B) **7.** 1024 **8.** 2880 **9.** (B)

10. 378 **11.** (A) **12.** (A) **13.** (D)

14. (A) **15.** 192; no change ; 14 ; 14

16. 9! × 9, (20) . 8 ! **17.** 240, 240, 255, 480

18. (D) **19.** (D) **20.** 18! ; $(3!)^2$ $(4!)^3$ (5!)

21. (A) **22.** (B) **23.** n!(n–1)! – 2(n–1)!

24. (A)(D) **25.** (A)(C) **26.** 256 **27.** (B)

28. (A) **29.** 2N **30.** (B)