PERMUTATION & COMBINATION

Direction: Read the following questions carefully and choose the right answer.

1. **Among the arrangements that can be made by using all the letters of the word "NATION", in how many arrangements N's come together?**

   A. 5! B. $\frac{}{2!}$ C. $\frac{5!}{2!}$ D. $\frac{4!}{2!}$ E. 6!

2. **In how many ways can the letters of the word 'PARAGLIDING' be arranged such that all the vowels occur together?**

   A. 88322 ways B. 120960 ways C. 740 ways D. 144868 ways E. None of these

3. **Five people out of whom only two can drive are to be seated in a five seater car with two seats in front and three in the rear. The people who know driving don't sit together. Only someone who knows driving can sit on the driver's seat. Find the number of ways the five people can be seated.**

   A. 40 B. 60 C. 48 D. 36 E. None of these

4. **A boy is playing a Snake & Ladder game; he is on 91 and has to get to 100 to complete the game. There is a snake on 93 and 96. In how many ways he can complete the game, if he doesn't want to roll the dice more than three times.**

   A. 20 B. 15 C. 16 D. 18 E. 19

5. **8 members are to be selected from a group of 9 males and 7 females. In how many ways will the members with at most 3 females and at least 4 males be selected?**

   A. 6472 ways B. 6286 ways C. 6435 ways D. 6225 ways E. None of these

6. **A chess board has rows and columns marked A to H and 1-8. Aman has a knight and a rook which he has to place on the board such that the two pieces are not in same row or column, what is total number of ways he can place the two pieces?**

   A. 3072 B. 3136 C. 6272 D. 6144 E. None of these

7. **Mukesh is the faculty in-charge of school's debate team. He has to select a team of 5 members for inter-school debate competition. A group of 7 boys and 8 girls are members of the debate club and the team must be selected from these members only. The rules of the competition says that each team must consist of at least 1 girl. Hence, Mukesh must have at least 1 girl in his team. In how many ways can Mukesh select his team?**

   A. 2982 B. 3150 C. 2754 D. 2850 E. 2684

8. In a supermarket, there are six different Chocos packets, four different Biscuit packets and two different Namkeen packets are to be arranged on a shelf so that the Chocos packet stand together, the Biscuit packet stand together and the Namkeen packet stand together. How many such arrangements are possible?

A. 203760 B. 207360 C. 260730 D. 270630 E. 270360

9. Five people are to be arranged on five chairs for a photograph such that three people among them do not want to sit next to each other. Find out the number of ways in which this can be done.

A. 15 B. 24 C. 12 D. 8 E. None of these

10. A square table has two seats on each side. A total of 10 people are there. In how many ways the seats of the table can be filled?

A. $\frac{10!}{64}$ B. $\frac{10!}{4}$ C. $\frac{10!}{16}$ D. $\frac{10!}{32}$ E. $\frac{10!}{8}$

11. How many three letter words can be formed using the letters of the word "PRACTICES"?

A. 56 B. 336 C. 216 D. 357 E. None of these

12. Six students sitting in a row are given one toffee each from three types of toffees such that no two adjacent child gets same type of toffee. In how many ways can the toffees be distributed among the students?

A. 120 B. 24 C. 96 D. 48 E. None of these

13. In how many different ways can the letters of the word "Thoughts" be arranged in such a way that the vowels always come together?

A. 2620 ways B. 2420 ways C. 2520 ways D. 2320 ways E. 2120 ways

14. An objective test with all the questions mandatory to be answered can be attempted in 127 ways such that the student gets atleast one question right. Find the number of ways in which he can answer 4 questions correctly.

A. 44 B. 35 C. 28 D. Can't be determined E. None of these

15. A postmaster wants to get delivered 6 letters at six different addresses. In the post office there are 2 postmen then in how many ways can the postmaster send the letters at different addresses through the postmen?

A. $\frac{}{2!}$ B. 6! × 2! C. 64 D. 36 E. None of these

16. In a school, there are two students: one boy and one girl. The class teacher distributes some number of books between the two students. If each student is eligible for any number of books then the number of ways the class teacher can distribute the books is 1024. Find how many books the class teacher has?

A. 12 B. 8 C. 10 D. 32 E. None of these

17. In a Job opening, 25 girls and 75 boys applied. The interviewer can select either a girl or a boy for the job. In how many ways the interviewer can make this selection?

A. ${}^{25}C_1 \times {}^{75}C_1$ B. $({}^{25}C_1 \times {}^{75}C_1)/2$ C. ${}^{75}C_2 \times {}^{25}C_2$ D. $({}^{75}C_2 \times {}^{25}C_2)/2$ E. None of these

18. In a class there are 15 students. It was to divide in two groups, A and B. The number of students in group A should be 7 and the number of students in group B should be 8. In how many ways, groups can be formed?

A. 12870 ways B. 4290 ways C. 17160 ways D. 3432 ways E. None of these

19. An examination consists of total 5 objective and 5 subjective questions. In how many ways, a student can solve 8 questions out of which 5 are objective and 3 are subjective?

A. 10 ways B. 50 ways C. 20 ways D. 25 ways E. None of these

20. How many numbers are there in between 100 and 1000 such that exactly one of their digits is 3 if repetition is not allowed?

A. 100 B. 200 C. 300 D. 525 E. None of these

21. In a room everybody shakes hands with everybody else. The total number of hand-shakes is 66. The total number of persons in the room is:

A. 11 B. 14 C. 10 D. 12 E. None of these

22. A shop has four types of fowlers namely - Tulip, Rose, Marigold and Lily. A person came in to buy 10 flowers such that he has at least one flower of each type. In how many ways can he do so, if the shop has sufficient amount of flowers of each type?

A. 84 B. 60 C. 24 D. 30 E. None of these

23. Twenty families, each comprising five members attend a wedding reception and exchanged a Diwali greetings card with every other person of a different family exactly once. Find the total number of card exchanges happening at the reception.

A. 10000 B. 9025 C. 9500 D. 11400 E. None of these

24. A volleyball team of 6 players is to be selected from a group of 8 male and 7 female players. In how many ways is the team selected such that at most two female players are there in the

team.

A. 1470 B. 1598 C. 1762 D. 1890 E. None of these

25. A volley ball team of six players is to be selected from a group of 9 male players 'x' female players. Find the value of 'x', if the number of ways to select a team having exactly two female players is equal to 1890.

A. 6 B. 7 C. 8 D. 9 E. None of these

26. There are 5 English, 4 Hindi and 3 regional newspaper options available in a library. In how many ways the owner can subscribe to five newspapers such that there are at least two English and two Hindi newspapers?

A. 230 B. 240 C. 220 D. 280 E. None of these

27. In how many ways the letters of the word "EXCITEMENT" can be arranged so that the distance between any two vowels is a multiple of 3?

A. 1380 B. 1200 C. 1440 D. 1460 E. None of these

28. Varun and Alia go to McDonald's. They both want to eat a meal which comprises of two burgers, one French fries, one cold drink and a dessert. There are 5 types of burgers, 2 types of French fries, 3 types of cold drinks and 5 types of desserts available. They will eat different burgers from each other and both the burgers in their meal will also be different, but they will have the same dessert. What is the number of ways in which they can place the order?

A. 27000 B. 5400 C. 21600 D. 4800 E. None of these

29. In a singing reality show 8 boys and 4 girls are selected from auditions and they are to be divided into teams of three captains Shaan, Niti and Mika. Two particular girls will join only Niti's Team and rest of the two girls will not be together. In how many ways the participants can be divided into teams?

A. 1120 B. 2400 C. 2240 D. 1680 E. None of these

30. There are three rows with three seats in each row. Four boys and two girls are to be seated in these three rows such that girls always sit in the last row. In how many ways the students can be seated?

A. 3490 B. 5040 C. 2880 D. 4560 E. None of these

31. Aana has 3 fifty rupee notes, 4 hundred rupee notes and 6 five hundred rupee notes in his pocket. If 2 notes are taken at random, what are the odds in favour of both notes being hundred rupee notes?

A. 1 : 13 B. 3 : 14 C. 4 : 19 D. 1 : 12 E. None of these

32. In how many different ways, the letters of the word 'CAPITA' can be arranged?

A. 360 B. 580 C. 620 D. 720 E. None of these

33. In how many different ways can the letters of the word "PATIENT" be arranged so that all the vowels come together?

A. 420 B. 450 C. 360 D. 320 E. None of these

34. In how many different ways can the letters of the word 'OPTICAL' be arranged so that be the vowels always come together?

A. 48 B. 120 C. 540 D. 720 E. None of these

35. In how many different ways letters of the word "EDUCATION" can be arranged such that all the consonants come together?

A. 18720 B. 18270 C. 17280 D. 12780 E. None of these

36. In how many different ways can the letters of the word "MARRIAGE" be arranged such that all the vowels come together?

A. 720 B. 360 C. 180 D. 540 E. None of these

37. A six letter word is to be formed by using at least two vowels in it. How many such words can be formed (not necessarily meaningful) if all the letters in word are different?

A. 53349120 B. 53439120 C. 53431920 D. 54339120 E. 53493120

38. In a badminton competition involving some men and women of a society, every person had to play exactly one game with every other person. It was found that in 36 games both the players were men and in 78 games both the players were women. Find the number of games in which one player was a man and other was a woman.?

A. 127 B. 117 C. 138 D. 146 E. None of these

39. What is the difference between the number of ways when three consecutive letters of the word 'ALLAHABAD' is selected in which two letters are same and the number of ways when two consecutive letters of the word 'BANGALORE' is selected in which one letter is vowel while other is consonant?

A. 4 B. 3 C. 7 D. 5 E. None of these

40. In how many different ways the letters of the word 'UGANDA' can be arranged such that 'G' always comes at first place and 'N' always comes at last place ?

A. 60 B. 360 C. 12 D. 24 E. 720

41. A five – letter word is to be formed from a group of 5 vowels and 4 consonants, using at least one vowel and at least one consonant. In how many ways the word having greater number of consonants than vowels can be formed?

A. 40 B. 42 C. 45 D. 52 E. 60

42. A committee of 8 members is to be selected from a group of 12 male and 10 female members. In how many ways the committee is selected such that at most two and at least one male member are there in the committee?

A. 13540 B. 14200 C. 15300 D. 16400 E. None of these

43. If a team of 4 persons is to be selected from 8 males and 8 females, then in how many ways can the selections be made to include at least 1 female.

A. 3500 B. 1875 C. 1750 D. 3000 E. None of these

44. Find the number of ways in which mixed double tennis game can be arranged amongst 9 married couples if no husband and wife play in the same game.

A. 1515 ways B. 1500 ways C. 1512 ways D. 1550 ways E. None of these

45. A basketball team of 5 players is to be selected from a group of 10 men and 8 women players. A volley ball team of 6 players is to be selected from a group of 8 men and 7 women players. Find the difference in the number of ways in which both the teams are selected, given that each team has only 2 female players.

A. 1890 B. 1920 C. 1950 D. 1990 E. None of these

46. Four letters are selected from the word "CAPAME" and are rearranged to form four letter words. How many words can be formed?

A. 120 B. 90 C. 180 D. 168 E. 192

47. A, B, C, D and E sit on five chairs all of which are facing north. C will sit only on the leftmost chair and B will not sit anywhere to the left of A. In how many ways they can be seated?

A. 10 B. 18 C. 36 D. 12 E. None of these

48. Six boys and 4 girls are to be seated in two separate rows with five chairs each, such that two particular girls are always together and all the girls are not in the same row. In how many ways can they be seated?

A. $15 \times 7!$ B. $20 \times 8!$ C. $18 \times 7!$ D. $(16 \times 8! - 4! \times 6!)$ E. None of these

49. Three chairs are arranged in a row facing three other chairs. 4 boys and 2 girls are to be seated on these chairs such that girls are always facing each other. In how many ways can they be seated?

A. 96 B. 72 C. 144 D. 120 E. None of these

50. In how many ways the letters of the word "UNDERDOG" can be arranged such that the first and last letters are same and no two vowels are together?

A. 72 B. 96 C. 132 D. 144 E. None of these

ANSWERS

1	A	**11**	D	**21**	D	**31**	D	**41**	C
2	B	**12**	C	**22**	A	**32**	A	**42**	C
3	D	**13**	C	**23**	E	**33**	C	**43**	C
4	C	**14**	B	**24**	D	**34**	D	**44**	C
5	C	**15**	C	**25**	A	**35**	C	**45**	A
6	B	**16**	C	**26**	D	**36**	A	**46**	E
7	A	**17**	E	**27**	C	**37**	B	**47**	D
8	B	**18**	A	**28**	B	**38**	B	**48**	B
9	C	**19**	A	**29**	C	**39**	B	**49**	C
10	E	**20**	B	**30**	B	**40**	C	**50**	D