



Work Sheet
on
Permutation &
Combination
Aptitude Training Course

BOARD INFINITY

Work-sheet on Permutation & Combination

1. How many 4-digit number can be formed using digits 1, 2, 3, 4 and 5 which are divisible by 4 and without any digits being repeated.
(a) 8 (b) 24 (c) 30 (d) 125
2. How many 5-digit no. can be formed using digits 1, 2, 3, 4, 5 and 6 which are divisible by 4 and without any digits being repeated?
(a) 144 (b) 168 (c) 192 (d) None of these
3. If 6 parallel lines are cut by another 5 parallel lines, then how many parallelograms can be formed?
(a) 24 (b) 30 (c) 150 (d) 600
4. In how many ways a 2-digit number can be formed using the digits 1, 3, 4, 5 and 7 when repetition is allowed.
(a) 20 (b) 25 (c) 5^5 (d) 2^5
5. The permutations and combinations of abcd taken 3 at a time are respectively.
(a) 12, 2 (b) 24, 4 (c) 36, 6 (d) 48, 8
6. A committee is to be formed comprising 7 members such that there is a simple majority of men and at least 1 woman. The shortlist consists of 9 men and 6 women. In how many ways can this be done?
(a) 3724 (b) 3630 (c) 4914 (d) 5670
7. There are 5 letters and 5 addressed envelopes. The number of ways in which all the letters can be put in wrong envelopes are?

- (a) 119 (b) 44 (c) 59 (d) 40

8. An invitation is required to be sent to a delegation for the healthcare meeting. In how many ways can Rohit invite at least 4 delegates out of the total of 8?

- (a) $[(1/4!.4!)+(1/5!3!)+(1/6!2!)+(1/7!1!)+(1/8!0!)] * 8!$ (c) 8C_4
 (b) ${}^8C_4 + {}^8C_5 + {}^8C_6 + {}^8C_7$ (d) 8P_4

9. In how many ways can 12 toys be divided equally among 4 kids?

- (a) $({}^{12}C_3)^4$ (b) $({}^{12}C_3)^4 \cdot 4!$ (c) ${}^{12}C_3 \cdot {}^9C_3 \cdot {}^6C_3 \cdot {}^3C_3$ (d) ${}^{12}C_3 \cdot {}^9C_3 \cdot {}^6C_3 \cdot {}^3C_3 / {}^4P_4$

10. If we permute 5 letters of the word 'mango', the number of permuted words with 'n' at the second place are

- (a) 24 (b) 6 (c) 12 (d) 14

11. If ${}^nC_5 = {}^nC_0$, then find the value of n.

- (a) $n = 0$ (b) $n = 1$ (c) $n = 5$ (d) $n = 10$

12. The number of ways in which the letters of the word 'RESULT' can be arranged without repetition is

- (a) 720 (b) 120 (c) 60 (d) 840

13. A teacher was trying to form the groups of students in such a way that every group has equal number of students and that number should be a prime number. She tried for first 5 prime numbers, but on each occasion exactly one student was left behind. If the number of students is in 4 digits, then how many different values can she take?

- (a) 0 (b) 2 (c) 3 (d) 4

14. A phone company offers 5 phone plan options: call waiting, call forwarding, voice mail, conferencing, and caller ID. A customer can choose 3 options. The number of ways one can avail the plan options is

- (a) 5 (b) 10 (c) 3 (d) 20

15. In how many different ways can the letters of the word 'HARDWARE' be arranged such that the vowels always come together?
(a) 120 (b) 1080 (c) 1440 (d) 4320 (e) 720
16. In how many ways can the letters of the word 'ELEPHANT' be arranged?
(a) 5760 (b) 6720 (c) 20160 (d) 40320
17. Mayank is going on a holiday trip. He wants to pack 3 t-shirts from 5 t-shirts he has. In how many ways can he make his choice?
(a) 15 (b) 10 (c) 8 (d) 20
18. A box contains 5 red, 4 white and 3 green balls. In how many ways can 3 balls be drawn from the box, without replacement, so that at least 2 of them are green?
(a) 18 (b) 28 (c) 27 (d) 9 (e) 30
19. In how many ways can 9 female and 7 male members be selected for a review team from a group of 15 females and 10 males?
(a) ${}^{15}C_9 + {}^{10}C_7$ (b) ${}^{15}P_9 + {}^{10}P_7$ (c) ${}^{15}P_9 \times {}^{10}P_7$ (d) ${}^{15}C_9 \times {}^{10}C_7$
20. What are the number of ways of arranging 9 books out of 14 in a library where the librarian, while arranging the books, got 2 damaged books and sent them for rebinding and repairing?
(a) ${}^{12}C_9$ (b) ${}^{12}P_9$ (c) ${}^{14}C_7$ (d) ${}^{14}P_7$
21. What is the number of ways of seating 7 candidates for an interview around a round table if all the 4 women want to sit together?
(a) $4! 3!$ (b) $4! 4!$ (c) ${}^7C_4 \times 4! \times 3!$ (d) ${}^7C_3 \times 7!$
22. Ram buys 7 novels from a book fair. Shyam buys 8 novels from another book fair, none of which is common with those bought by Ram. They decide to exchange their books one for one. In how many ways can they exchange their books for the first time?

- (a) $7! * 8!$ (b) $7 * 8!$ (c) $7! * 8$ (d) 56

23. In how many ways can the letters of the word "SMUDGE" be arranged such that the vowels always come together?

- (a) 150 (b) 120 (c) 240 (d) 720

24. Out of 9 people waiting for their turns for an interview, in how many ways can a selection of 4 be made if 1 particular person is always selected?

- (a) 8C_4 (b) ${}^9C_4 - {}^1C_1$ (c) 8C_3 (d) 8P_4

25. In how many ways can 10 chairs be divided and arranged for 2 cabins A and B with 4 and 6 chairs respectively?

- (a) ${}^{10}C_4 \times {}^6C_6$ (b) ${}^{10}C_4 \times {}^6C_6 \times 10!$ (c) ${}^{10}C_4 \times {}^{10}C_6 \times {}^{10}P_{10}$
(d) ${}^{10}C_4 \times {}^4P_4 \times {}^6P_6$

26. A five-digit number divisible by 3 is to be formed using numerals 0, 1, 2, 3, 4 and 5 without repetition. The total number of ways this can be done is?

- (a) 216 (b) 240 (c) 600 (d) 3125

27. In how many ways can 7 members of the content team, 5 members of the R&D team, 3 members of HR and 2 members of the Sales team be allotted workstations in a row so that all employees of the same team sit together?

- (a) $12! * 5!$ (b) $7 * 5 * 3 * 2$ (c) $7! * 5! * 3! * 2!$ (d) $7! * 5! * 4! * 3! * 2!$
(e) 17!

28. The total combinations of picking 3 balloons from a packet of 25 balloons are

- (a) 2100 (b) 2200 (c) 2300 (d) 2400

29. If we permute 6 letters of the word 'SYSTEM', the number of permuted words with a vowel at the third place are

- (a) 720 (b) 120 (c) 60 (d) 24

30. How many 3-digit numbers can be formed using the digits 0,2,3,5 and 7? (Repetition not allowed)
(a) 60 (b) 72 (c) 48 (d) 108
31. How many 4 – digit numbers can be formed by using the digits 0, 1, 2, 3, 4, 5 which are divisible by 5? (Repetition not allowed)
(a) 120 (b) 108 (c) 96 (d) 48
32. By using the letters of the word success, how many words can be formed in which all the S are together?
(a) 420 (b) 120 (c) 60 (d) 20
33. In how many ways the letters of the word ENGLISH can be arranged such that vowels occupy odd places?
(a) 144 (b) 360 (c) 480 (d) 1440
34. There are 3 apples, 4 oranges and 5 mangoes in a basket. In how many ways a person can select at least one fruit from the basket?
(a) 60 (b) 59 (c) 120 (d) 119
35. In how many ways 5 men and 4 women can be seated in a row such that no two women sit together?
(a) $5!4!$ (b) $5! {}^5C_4$ (c) $5! {}^6P_4$ (d) $4! {}^6P_5$
36. In how many ways 5 English, 4 Hindi and 3 Sanskrit books can be arranged in a library such that books of same kind are to be together?
(a) $5!3!4!$ (b) $12!$ (c) $12 \cdot 11!$ (d) None of these
37. In how many ways 12 members can be seated in a row such that two particular persons never sit together?

(a) $11!2!$ (b) $11*11!$ (c) $12*11!$ (d) $10*11!$

38. In how many ways 8 men can be seated around a circular table in a meeting such that the president & vice president always sit side – by – side?

(a) $8!2!$ (b) $6!2!$ (c) $7!2!$ (d) $8!$

39. How many four digit numbers can be formed by using the digits $\{0,1,3,5,7,2\}$ which are divisible by 25 when each digit can occur any number of times?

(a) 120 (b) 30 (c) 90 (d) 60

40. An eight letter word is formed by using all the letters of the word EQUATION. How many of these words begin with a consonant and end with a vowel?

(a) 3600 (b) 10800 (c) 2160 (d) 720

41. In how many ways can ten students be seated around a circular table so that three students always sit together?

(a) $7!$ (b) $7!3!$ (c) $2(7!)$ (d) $3(7!)$

42. In how many ways can a cricket team of 11 members be selected from 15 players, so that a particular player is included and another particular player is left out?

(a) 216 (b) 826 (c) 286 (d) 386

43. A chess tournament is conducted in which n players participate. Each player played exactly once against every other player. The number of games played is 253. Find the value of n ?

(a) 19 (b) 25 (c) 24 (d) 23

44. A bag contains 6 white balls and 3 black balls. In how many can 4 balls be selected so that there is at least one ball of each color and there are at most two black balls?

(a) 60 (b) 105 (c) 45 (d) 99

45. From 5 different vowels, 4 different consonants and 4 different numerals, a string pattern have to be formed having 3 different vowels, 2 different consonants and a numeral. How many such patterns end in a numeral?
(a) 2,400 (b) 28,800 (c) 45,200 (d) 34,400
46. If 36 games were played at a chess tournament with each contestant playing once against every other contestant, then the number of contestants is
(a) 8 (b) 9 (c) 7 (d) 18
47. There are 16 points in a plane of which 7 are on a straight line. Then how many straight lines can be formed and triangles respectively?
(a) 105,525 (b) 100,400 (c) 78,234 (d) 100,525
48. Find the sum of all numbers that can be formed by taking all the digits at a time from 1, 2, 4 and 6 without repetition?
(a) 86,568 (b) 86,658 (c) 85,866 (d) 88,665
49. All the letters of the word STREAM are taken and permuted. The words thus obtained are arranged in an alphabetical order as in a dictionary. What is the rank of the word MASTER?
(a) 300 (b) 257 (c) 298 (d) 258
50. How many numbers can be formed using all the digits 6,3,5,4,4,5,4,3,2 and 5 without repetition, such that the even digits always occupy the even places?
(a) 200 (b) 300 (c) 400 (d) 600
51. Among the arrangements that can be made by using all the letters of the word ALTERNATE, in how many arrangements the E's do not come together?
(a) $(7 \times 8!) / 8$ (b) $8! \times 8$ (c) $8! - 7!2!$ (d) $(8! \times 7) / 2$
52. Ten candidates are attending a group discussion session. They are initially divided into two groups and are made to sit around two circular tables, one of which can

accommodate 4 persons, and the other table can accommodate 6 persons. In how many ways can the candidate settle themselves down for the group discussion?

- (a) $10! / 24$ (b) $10! / 25$ (c) $10! / (6! \cdot 4!)$ (d) $10! \cdot 6! \cdot 4!$

53. A plane can accommodate 250 passengers, 140 in the economy class and 110 in the business class. In how many ways can 250 passengers be accommodated if 25 refuse to sit in economy class and 20 cannot afford the business class?

- (a) $(205!) (110!) (140!) / (120!) (85!)$ (b) $205! / (85! 120!)$
 (b) (c) $250! / (140! 10!)$ (d) $250! 140! 110! / (85! 120!)$

54. A box contains 10 balls out of which 3 are red and the rest are blue. In how many ways can a random sample of 6 balls be drawn from the bag so that at the most 2 red balls are included in the sample and no sample has all the 6 balls of the same colour?

- (a) 105 (b) 168 (c) 189 (d) 120

55. In a hockey championship, there were 153 matches played. Every two teams played one match with each other. The number of teams participating in the championship is

- (a) 18 (b) 19 (c) 17 (d) 16

56. There are three prizes to be distributed among five students. If no students get more than one prize, then this can be done in how many ways?

- (a) 10 (b) 30 (c) 60 (d) 80

57. A pack of 52 playing cards comprises four suites of 13 cards each. In each suits, there are cards of 13 distinct face values- from 1 to 13. In how many ways can a pack of 52 playing cards be distributed equally into four sets such that each set receives cards of all the possible face values?

- (a) ${}^{52}C_{13}$ (b) $(4!)^{12}$ (c) $52! / (13!)^4$ (d) $(13!)^4$

58. In how many ways can a student choose a programme of 5 courses if 9 courses are available and 2 courses are compulsory for every student?

- (a) 45 (b) 35 (c) 55 (d) 65

59. There are 15 buses running between Delhi and Mumbai. In how many ways can a man go to Mumbai and return by a different bus?

- (a) 280 (b) 310 (c) 240 (d) 210

60. How many different necklaces can be formed with 6 white and 5 red beads?

- (a) 18 (b) 24 (c) 21 (d) 27