PERMUTATION ASSIGNMENT

1. The value of $2^n\{1.3.5.....(2n-3)(2n-1)\}$ is

(a) $\frac{(2n)!}{n!}$ (b) $\frac{(2n)!}{2^n}$ (c) $\frac{n!}{(2n)!}$ (d) None of these

2. If ${}^{56}P_{r+6} : {}^{54}P_{r+3} = 30800 : 1$, then *r* =

(a) 31 (b) 41 (c) 51 (d) None of these

3. The value of ${}^{n}P_r$ is equal to

(a) ${}^{n-1}P_r + r\ {}^{n-1}P_{r-1}$ (b) $n.{}^{n-1}P_r + {}^{n-1}P_{r-1}$ (c) $n({}^{n-1}P_r + {}^{n-1}P_{r-1})$ (d) ${}^{n-1}P_{r-1} + {}^{n-1}P_r$

4. The exponent of 3 in 100 ! is

(a) 33 (b) 44 (c) 48 (d) 52

5. The number of positive integral solutions of $abc = 30$ is

(a) 30 (b) 27 (c) 8 (d) None of these

6. The number of 4 digit even numbers that can be formed using 0, 1, 2, 3, 4, 5, 6 without repetition is

(a) 120 (b) 300 (c) 420 (d) 20

7. The number of five digits numbers that can be formed without any restriction is

(a) 990000 (b) 100000 (c) 90000 (d) None of these

8. How many numbers less than 1000 can be made from the digits 1, 2, 3, 4, 5, 6 (repetition is not allowed)

(a) 156 (b) 160 (c) 150 (d) None of these

9. How many even numbers of 3 different digits can be formed from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 (repetition is not allowed)

(a) 224 (b) 280 (c) 324 (d) None of these

10. A five digit number divisible by 3 has to formed using the numerals 0, 1, 2, 3, 4 and 5 without repetition. The total number of ways in which this can be done is

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

11. How many numbers lying between 10 and 1000 can be formed from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 (repetition is allowed)

(a) 1024 (b) 810 (c) 2346 (d) None of these

12. Ten different letters of an alphabet are given. Words with five letters are formed from these given letters. Then the number of words which have at least one letter repeated is

(a) 69760 (b) 30240 (c) 99748 (d) None of these

13. Six identical coins are arranged in a row. The number of ways in which the number of tails is equal to the number of heads is

(a) 20 (b) 9 (c) 120 (d) 40

14. The total number of permutations of $n(>1)$ different things taken not more than *r* at a time, when each thing may be repeated any number of times is

(a) $\frac{n(n^n-1)}{n-1}$ (b) $\frac{n^r-1}{n-1}$ (c) $\frac{n(n^r-1)}{n-1}$ (d) None of these

15. How many number less than 10000 can be made with the eight digits 1, 2, 3, 4, 5, 6, 7, 0 (digits may repeat)

(a) 256 (b) 4095 (c) 4096 (d) 4680

16. The total number of natural numbers of six digits that can be made with digits 1, 2, 3, 4, if the all digits are to appear in the same number at least once, is

(a) 1560 (b) 840 (c) 1080 (d) 480

17. A library has *a* copies of one book, *b* copies of each of two books, *c* copies of each of three books and single copies of *d* books. The total number of ways in which these books can be distributed is

(a) $\frac{(a+b+c+d)!}{a!b!c!}$ (b) $\frac{(a+2b+3c+d)!}{a!(b!)^2(c!)^3}$ (c) $\frac{(a+2b+3c+d)!}{a!b!c!}$ (d) None of these

18. The number of ways of arranging 2*m* white counters and 2*n* red counters in a straight line so that the arrangement is symmetrical with respect to a central mark

(a) $(m+n)!$ (b) $\frac{(m+n)!}{m!n!}$ (c) $\frac{2(m+n)!}{m!n!}$ (d) None of these

19. Total number of four digit odd numbers that can be formed using 0, 1, 2, 3, 5, 7 are

(a) 216 (b) 375 (c) 400 (d) 720

20. The number of ways of arranging the letter AAAAA BBB CCC D EE F in a row when no two C's are together is

(a) $\frac{15!}{5!3!3!2!} - 3!$ (b) $\frac{15!}{5!3!3!2!} - \frac{13!}{5!3!2!}$ (c) $\frac{12!}{5!3!2!} \times \frac{{}^{13}P_3}{3!}$ (d) $\frac{12!}{5!3!2!} \times {}^{13}P_3$

21. The number of 4 digit numbers that can be made with the digits 1, 2, 3, 4 and 5 in which at least two digits are identical, is

(a) $4^5 - 5!$ (b) 505 (c) 600 (d) None of these

22. How many numbers greater 40000 can be formed from the digits 2, 4, 5, 5, 7

(a) 12 (b) 24 (c) 36 (d) 48

23. In how many ways *n* books can be arranged in a row so that two specified books are not together

(a) $n!-(n-2)!$ (b) $(n-1)!(n-2)$ (c) $n!-2(n-1)$ (d) $(n-2)n!$

24. How many numbers between 5000 and 10,000 can be formed using the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 each digit appearing not more than once in each number

(a) $5\times{}^8P_3$ (b) $5\times{}^8C_3$ (c) $5!\times{}^8P_3$ (d) $5!\times{}^8C_3$

25. Find the total number of 9 digit numbers which have all the digits different

(a) 9 × 9 ! (b) 9 ! (c) 10 ! (d) None of these

26. Four dice (six faced) are rolled. The number of possible outcomes in which at least one die shows 2 is

(a) 1296 (b) 625 (c) 671 (d) None of these

27. How many numbers, lying between 99 and 1000 be made from the digits 2, 3, 7, 0, 8, 6 when the digits occur only once in each number

(a) 100 (b) 90 (c) 120 (d) 80

28. The sum of the digits in the unit place of all numbers formed with the help of 3, 4, 5, 6 taken all at a time is

(a) 18 (b) 432 (c) 108 (d) 144

29. All letters of the word AGAIN are permuted in all possible ways and the words so formed (with or without meaning) are written as in dictionary, then the 50^{th} word is

(a) NAAGI (b) IAANG (c) NAAIG (d) INAGA

30. Eight chairs are numbered 1 to 8. Two women and three men wish to occupy one chair each. First the women choose the chairs from amongst the chairs marked 1 to 4 and then men select the chairs from amongst the remaining. The number of possible arrangements is

(a) ${}^6C_3\times{}^4C_2$ (b) ${}^4C_2\times{}^4P_3$ (c) ${}^4P_2\times{}^4P_3$ (d) None of these

31. If *a* denotes the number of permutations of $x+2$ things taken all at a time, *b* the number of permutations of *x* things taken 11 at a time and *c* the number of permutations of $x-11$ things taken all at a time such that $a=182bc$, then the value of *x* is

(a) 15 (b) 12 (c) 10 (d) 18

32. In how many ways can 15 members of a council sit along a circular table, when the Secretary is to sit on one side of the Chairman and the Deputy secretary on the other side

(a) $2\times12!$ (b) 24 (c) 2 × 15 ! (d) None of these

33. 20 persons are invited for a party. In how many different ways can they and the host be seated at a circular table, if the two particular persons are to be seated on either side of the host

(a) 20! (b) 2 . 18 ! (c) 18 ! (d) None of these

34. 12 persons are to be arranged to a round table. If two particular persons among them are not to be side by side, the total number of arrangements is

(a) 9(10 !) (b) 2 (10 !) (c) 45 (8 !) (d) 10 !

35. The number of ways that 8 beads of different colours be string as a necklace is

(a) 2520 (b) 2880 (c) 5040 (d) 4320

36. The number of ways in which 6 men and 5 women can dine at a round table if no two women are to sit together is given by

(a) 6 ! × 5 ! (b) 30 (c) 5 ! × 4 ! (d) 7 ! × 5 !

37. In how many ways can 10 persons sit, when 6 persons sit on one round table and 4 sit on the other round table

(a) 5 ! × 3 ! (b) 10 × 5! × 3 ! (c) ${}^{10}C_6$ × 5 !× 3! (d) ${}^{10}C_6$ × 5! × 3! × 2!

38. If ${}^{2n}C_3:{}^nC_2=44:3$, then for which of the following values of *r*, the values of ${}^nC_r$ will be 15

(a) $r=3$ (b) $r=4$ (c) $r=6$ (d) $r=5$

39. ${}^nC_r+{}^{n-1}C_r+......+{}^rC_r=$

(a) ${}^{n+1}C_r$ (b) ${}^{n+1}C_{r+1}$ (c) ${}^{n+2}C_r$ (d) 2^n

40. The solution set of ${}^{10}C_{x-1}>2\,.\,{}^{10}C_x$ is

(a) {1, 2, 3} (b) {4, 5, 6} (c) {8, 9, 10} (d) {9, 10, 11}

41. $\sum_{r=0}^{m}{}^{n+r}C_n=$

(a) ${}^{n+m+1}C_{n+1}$ (b) ${}^{n+m+2}C_n$ (c) ${}^{n+m+3}C_{n-1}$ (d) None of these

42. If $\alpha={}^mC_2$, then ${}^{\alpha}C_2$ is equal to

(a) ${}^{m+1}C_4$ (b) ${}^{m-1}C_4$ (c) $3\,{}^{m+2}C_4$ (d) $3\,{}^{m+1}C_4$

43. ${}^{14}C_4 + \sum_{j=1}^{4} {}^{18-j}C_3$ is equal to

(a) ${}^{18}C_3$ (b) ${}^{18}C_4$ (c) ${}^{14}C_7$ (d) None of these

44. If $a_n = \sum_{r=0}^{n} \frac{1}{{}^nC_r}$ then $\sum_{r=0}^{n} \frac{r}{{}^nC_r}$ equals

(a) $(n-1)a_n$ (b) na_n (c) $\frac{1}{2}na_n$ (d) None of these

45. The number of ways in which 10 persons can go in two boats so that there may be 5 on each boat, supposing that two particular persons will not go in the same boat is

(a) $\frac{1}{2}({}^{10}C_5)$ (b) $2({}^8C_4)$ (c) $\frac{1}{2}({}^8C_5)$ (d) None of these

46. There are 10 persons named *A, B,....J*. We have the capacity to accommodate only 5. In how many ways can we arrange them in a line if *A* is must and *G* and *H* must not be included in the team of 5

(a) ${}^8P_5$ (b) ${}^7P_5$ (c) ${}^7C_3(4!)$ (d) ${}^7C_3(5!)$

47. The number of ways in which we can select three numbers from 1 to 30 so as to exclude every selection of all even numbers is

(a) 4060 (b) 3605 (c) 455 (d) None of these

48. In a steamer there are stalls for 12 animals and there are horses, cows and calves (not less than 12 each) ready to be shipped. They can be loaded in

(a) $3^{12}-1$ (b) 3^{12} (c) $(12)^3-1$ (d) None of these

49. There are $(n+1)$ white and $(n+1)$ black balls each set numbered 1 to $n+1$. The number of ways in which the balls can be arranged in a row so that the adjacent balls are of different colours is

(a) $(2n+2)!$ (b) $(2n+2)! \times 2$ (c) $(n+1)! \times 2$ (d) $2\{(n+1)!\}^2$

50. Sixteen men compete with one another in running, swimming and riding. How many prize lists could be made if there were altogether 6 prizes of different values one for running, 2 for swimming and 3 for riding

(a) $16^3 \times 15 \times 14^2$ (b) $16^3 \times 15^2 \times 14$ (c) $16 \times 15 \times 14$ (d) None of these