CTQ - 2023

CTQ : Concept Through Questions **Year : 2023**

Topic : Permutation & Combination

1. In how many ways 3 letters can be posted in 4 letter-boxes, if all the letters are not posted in the same letter-box?
   (a) 63 (b) 60 (c) 77 (d) 81 Video Solution
2. If 7 points out of 12 are in the same straight line, then the number of triangles formed is
   (a) 19 (b) 158 (c) 185 (d) 201 Video Solution
3. A bag contains 3 black, 4 white and 2 red balls, all the balls being different. The number of selections of at most 6 balls containing balls of all the colours, is
   (a) 42(4!) (b) $2^6 \times 4!$ (c) $(2^6 01)4!$ (d) None of these Video Solution
4. Total number of n digit numbers (n>1) having the property that no two consecutive digits are same, is
   (a) 8^n (b) 9^n (c) 9.10^{n-1} (d) None of these Video Solution
5. If ${}^{n-1}C_6 + {}^{n-1}C_7 > {}^{n}C_6$, then
   (a) $n > 4$ (b) $n > 12$ (c) $n \geq 13$ (d) $n > 13$ Video Solution
6. If r>p>q, the number of different selections of p+q thing taking r at a time, where p things are identical and q other things are identical, is
   (a) $p + q - r$ (b) $p + q - r + 1$
   (c) $r - p - q + 1$ (d) None of these Video Solution
7. $S_1, S_2, \ldots, S_{10}$ are the speakers in a conference. If S_1 addresses only after S_2, then the number of ways the speakers address is
   (a) 10! (b) 9! (c) 10× 8! (d) $\frac{10!}{2!}$ Video Solution
8. 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! Video Solution
9. A student is to answer 10 out of 13 questions in an examination such that he must choose at least 4 from the first five questions. The number of choices available to him is
   (a) 140 (b) 196 (c) 280 (d) 346 Video Solution
10. The straight lines l_1, l_2, l_3 are parallel and lie in the same plane. A total numbers of m points are taken on l_1, n points on l_2, k points on l_3. The maximum number of triangles formed with vertices at these points is
    (a) ${}^{m+n+k}C_3$ (b) ${}^{m+n+k}C_3 - {}^{m}C_3 - {}^{n}C_3 - {}^{k}C_3$
    (c) ${}^{m}C_3 + {}^{n}C_3 + {}^{k}C_3$ (d) None of these Video Solution
11. In a Mathematics paper there are three sections containing 4, 5 and 6 questions respectively. From each section 3 questions are to be answered. In how many ways can be selection of questions be made?
    (a) 34 (b) 800 (c) 1600 (d) 9600 Video Solution
12. 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 book 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 Video Solution

13. If ${}^{n+2}C_8 : {}^{n-2}P_4 = \frac{57}{16}$, then n is equal to

(a) 19 (b) 2 (c) 20 (d) 5 Video Solution

14. If $\frac{1}{{}^4C_n} = \frac{1}{{}^5C_n} + \frac{1}{{}^6C_n}$, , then n is equal to

(a) 3 (b) 2 (c) 1 (d) 0 Video Solution

15. If P(n ,r)=1680 and C(n,r)=70, then 69n+r! is equal to

(a) 128 (b) 576 (c) 256 (d) 625 Video Solution

16. How many 10 digit numbers can be written by using the digits 1 and 2?

(a) ${}^{10}C_1 + {}^9C_2$ (b) 2^{10} (c) ${}^{10}C_2$ (d) 10! Video Solution

17. If P_m stands for ${}^mP_m$, then $1 + 1P_1 + 2P_2 + 3P_3 + \ldots + n.P_n$ is equal to

(a) $n!$ (b) $(n+3)!$ (c) $(n+2)!$ (d) $(n+1)!$ Video Solution

18. If ${}^{2n+1}P_{n-1} : {}^{2n-1}P_n = 3:5$, then n is equal to

(a) 4 (b) 6 (c) 3 (d) 8 Video Solution

19. How many numbers of 6 digits can be formed from the digits of the number 112233?

(a) 30 (b) 30 (c) 90 (d) 120 Video Solution

20. If r, s, t are prime numbers and p, q are the positive integers such that LCM of p,q is $r^2\ s^4\ t^2$, then the number of ordered pairs (p,q) is

(a) 252 (b) 254 (c) 225 (d) 224 Video Solution

21. The number of words which can be formed the letters of the word MAXIMUM, if two consonants cannot occur together, is

(a) 4! (b) $3! \times 4!$

(c) 7! (d) None of these Video Solution

22. The number of ordered pairs (m, n), m, n ∈ {1, 2,.....,100} such that $7^m + 7^n$ is divisible by 5 is

(a) 1250 (b) 2000 (c) 2500 (d) 5000 Video Solution

[NIMCET 2008]

23. An eight digit number divisible by 9 is to be formed by using 8 digits out of the digits 0, 1, ...,9 without replacement. The number of ways in which this can be done is:

(a) 9! (b) 2(7!) (c) 4(7!) (d) 36(7!) Video Solution

[NIMCET 2008]

24. Pick the 1st, 2nd, 4th, 5th and 6th letters in the word REASONING, from yet another word and then write the first and last letters of the word formed.

(a) SE (b) ES (c) NE (d) OR Video Solution

[NIMCET 2009]

25. There are 10 points in a plane. Out of these 6 are collinear. The number of triangles formed by joining these points is :

(a) 100 (b) 120

(c) 150 (d) None of these Video Solution

[NIMCET 2009]

26. How many different paths in the xy-plane are there from (1, 3) to (5, 6), if a path proceeds one step at a time by going either one step to the right (R) or one step upward (U) ?
(a) 35 (b) 40
(c) 45 (d) None of these Video Solution
[NIMCET 2009]

27. The sum of integers between 200 and 400, that are multiples of 7 is
(a) 8729 (b) 8700 (c) 8972 (d) 8279 Video Solution
[NIMCET 2013]

28. The total number of numbers that can be formed using the digits 5, 3 and 7 only if no repetitions are allowed, is.
(a) 39 (b) 105 (c) 15 (d) 27 Video Solution
[NIMCET 2013]

29. The number of non –negative integers less than 1000 that contain the digit 1 are.
(a) 9^2 (b) 9^3 (c) $10^2 - 9^2$ (d) $10^3 - 9^3$ Video Solution
[NIMCET 2013]

30. In how many different ways can the letters of the word "CORPORATION" be arranged so that all the vowels is always come together?
(a) 810 (b) 1440 (c) 2880 (d) 50400 Video Solution
[NIMCET 2013]

31. Let T_n denote the number of triangles which can be formed by using the vertices of a regular polygon of n sides. If $T_{n+1} - T_n = 21,$ then n is equal to
(a) 5 (b) 7 (c) 6 (d) 4 Video Solution
[NIMCET 2013]

32. How many even integers between 4000 and 7000 have four different digits?
(a) 672 (b) 840 (c) 504 (d) 728 Video Solution
[NIMCET 2014]

33. There are 8 students appearing in an examination of which 3 have to appear in Mathematics paper and the remaining 5 in different subjects. Then the number of ways they can be made to sit in a row, if the candidates in Mathematics cannot sit next to each other is
(a) 2400 (b) 16200 (c) 4200 (d) 14400 Video Solution
[NIMCET 2014]

34. If n and r are integers such that $1 \leq r \leq n,$ then the value of $n({}^{n-1}C_{r-1})$ is
(a) ${}^{n}C_r$ (b) $r({}^{n}C_r)$ (c) $n({}^{n}C_r)$ (d) ${}^{n-1}C_r$ Video Solution
[NIMCET 2014]

35. The number of ways to arrange the letters of the English alphabet, so that there are exactly 5 letters a and b, is
(a) ${}^{24}P_3$ (b) $2 \times {}^{24}P_5 \times 20!$
(c) ${}^{24}P_2$ 20! 2 (d) ${}^{24}P_5$ 24! 2 Video Solution
[NIMCET 2014]

36. The number of ways in which 5 days can be chosen each of the 12 months of a non-leap year, is
(a) $({}^{30}C_5)^4({}^{31}C_5)^7({}^{28}C_5)$ (b) $({}^{30}C_5)^6({}^{28}C_5)^6$
(c) $({}^{30}C_5)^7({}^{31}C_5)^4({}^{28}C_5)$ (d) $({}^{30}C_5)^5({}^{31}C_5)^6({}^{28}C_5)$ Video Solution

[NIMCET 2014]

37. A password consists of two alphabets from English followed by three digits chosen from 0 to 3. If repetitions are allowed. The number of different passwords is
(a) ${}^{25}P_1 \times {}^{25}P_1 \times {}^{4}P_1 \times {}^{3}P_1 \times {}^{2}P_1$ (b) $({}^{26}P_1)^2 \times ({}^{4}P_1)^3$
(c) ${}^{26}P_1 \times {}^{25}P_2 \times {}^{4}P_1 \times {}^{4}P_2 \times {}^{4}P_3$ (d) $({}^{26}P_2 \times {}^{4}P_1)^2$ Video Solution

[NIMCET 2014]

38. The number of bit strings of length 10 that contain either five consecutive 0's or five consecutive 1's is
(a) 64 (b) 112 (c) 220 (d) 222 Video Solution

[NIMCET 2015]

39. If $42({}^{n}P_2) = {}^{n}P_4$, then the value of n is
(a) 2 (b) 4 (c) 9 (d) 42 Video Solution

[NIMCET 2015]

Answer Key

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	B	C	A	B	D	B	D	A	B	B
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	B	B	A	B	B	B	D	A	C	C
Ques.	21	22	23	24	25	26	27	28	29	30
Ans.	A	C	D	A	A	A	A	C	D	D
Ques.	31	32	33	34	35	36	37	38	39	
Ans.	B	D	D	B	B	A	B	D	C	