



PERMUTATIONS AND COMBINATIONS

Class 11 - Mathematics

Time Allowed: 1 hour and 30 minutes

Maximum Marks: 45

1. If ${}^n P_r = 720$ and ${}^n C_r = 120$, find r. [1]
2. There are 5 men and 5 ladies to dine at a round table. In how many ways can they sit so that no ladies are together? [1]
3. From 4 officers and 8 jawans in how many ways can 6 be chosen to include exactly one officer? [1]
4. In how many different ways can a garland of 16 different flowers be made? [1]
5. Find the number of ways in which 8 different beads can be arranged to form a necklace. [1]
6. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if all letters are used at a time. [1]
7. In how many ways can 8 persons be seated at a round table so that all shall not have the same neighbours in any two arrangement? [1]
8. How many different words can be formed by using all the letters of the word ALLAHABAD? [1]
9. Compute: $\frac{32!}{20!}$ [1]
10. How many 4-digit numbers can be formed with the digits 0, 2, 3, 4, 5 when a digit may be repeated any numbers of time in any arrangement? [1]
11. Find the total number of ways in which 20 balls can be put into 5 boxes so that first box contains just one ball. [3]
12. For all positive integers n, show that ${}^{2n} C_n + {}^{2n} C_{n-1} = \frac{1}{2} ({}^{2n+2} C_{n+1})$. [3]
13. A bag contains 6 red balls and 8 green balls. Determine the number of ways in which 4 red balls and 5 green balls can be selected. [3]
14. If the letters of the word LATE be permuted and the words so formed be arranged as in a dictionary, find the rank of the word LATE. [3]
15. Find: r, if $5 {}^4 P_r = 6 {}^5 P_{r-1}$ [3]
16. In an examination, a question paper consists of 12 questions divided into two parts i.e., part I and part II containing 5 and 7 questions, respectively. A student is required to attempt 8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions? [5]
17. How many different 4-digit numbers can be formed from the digits 2, 3, 4 and 6, if each digit is used only once in a number? Further, how many of these numbers
 - i. end at 4?
 - ii. end at 3?
 - iii. end at 3 or 4? [5]
18.
 - i. Find how many arrangements can be made with the letters of the word MATHEMATICS. [5]
 - ii. In how many of them are the vowels together?
19. How many 3-digit odd numbers can be formed by using the digits 1,2,3, 4, 5,6 when [5]

- i. the repetition of digits is not allowed?
- ii. the repetition of digits is allowed?

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