MATHS

NCERT - NCERT MATHEMATICS(TELUGU)

PERMUTATIONS AND COMBINATIONS

Example

1. Find the number of 4 letter words, with or without meaning, which can be formed out of

the letters of the word ROSE, where the repetition of the letters is not allowed.

2. Given 4 flags of different colours, how many different signals can be generated, if a signal requires the use of 2 flags one below the other?

3. How many 2 digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if the digits can be repeated?

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4. Find the number of different signals that can be generated by arranging at least 2 flags in order (one below the other) on a vertical staff, if five different flags are available.

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5. Evaluate : 5!

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6. Evaluate : 7!

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7. Evaluate :7! - 5!

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8. Compute : $\frac{7!}{5!}$

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9. Compute : $\frac{12!}{(10!)(2!)}$

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10. Evaluate $\frac{n!}{r!(n-r)!}$, when n = 5, r = 2.

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11. If $\frac{1}{8!}+\frac{1}{9!}=\frac{x}{10!}$, find x.

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12. Find the number of permutations of the letters of the word ALLAHABAD.

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13. How many 4-digit numbers can be formed by using the digits 1 to 9 if repetition of digits is not allowed?

14. How many numbers lying between 100 and 1000 can be formed with the digits 0, 1, 2, 3, 4, 5, if the repetition of the digits is not allowed?

15. Find the value of n such that

$^{n}P_{5} = 42^{n}P_{3}, n > 4$

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16. Find the value of n such that

$\frac{^{n}P_{4}}{^{n-1}P_{4}} = \frac{5}{3}, n > 4$

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17. Find r, if $5^{4}P_{r} = 6^{5}P_{r-1}$

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18. Find the number of different 8-letter arrangements that can be made from the letters of the word DAUGHTER so that all vowels occur together .

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19. Find the number of different 8-letter arrangements that can be made from the

letters of the word DAUGHTER so that all vowels do not occur together.

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20. In how many ways can 4 red, 3 yellow and 2 green discs be arranged in a row if the discs of the same colour are indistinguishable ?

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21. Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements,

do the words start with P .

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22. Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements,

do all the vowels always occur together

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23. Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements,

do the vowels never occur together

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24. Find the number of arrangements of the letters of the word INDEPENDENCE. In how

many of these arrangements,

do the words begin with I and end in P?

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25. If ${}^{n}C_{9} = {}^{n}C_{8}$, find ${}^{n}C_{17}$.

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26. A committee of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done?

How many of these committees would consist of 1 man and 2 women?

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27. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these

(i) four cards are of the same suit,

(ii) four cards belong to four different suits,

(iii) are face cards,

(iv) two are red cards and two are black cards,

(v) cards are of the same colour?

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28. How many words, with or without meaning, each of 3 vowels and 2 consonants can be formed from the letters of the word INVOLUTE ?

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29. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) no girl ? (ii) at least one boy and one girl ? (iii) at least 3 girls ?

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30. Find the number of words with or without meaning which can be made using all the letters of the word AGAIN. If these words are

written as in a dictionary, what will be the 50^{th} word?

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31. The number of even numbers greater than 1000000 that can be formed using all the digit 1, 2, 0, 2, 4, 2 and 4 is

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32. In how many ways can 5 girls and 3 boys be seated in a row so that no two boys are together?

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Exercise 7 1

1. How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that

(i) repetition of the digits is allowed?

(ii) repetition of the digits is not allowed?

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2. How many 3-digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 if the digits can be repeated?

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3. How many 4-letter code can be formed using the first 10 letters of the English alphabet, if no letter can be repeated?

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4. How many 5-digit telephone numbers can be constructed using the digits 0 to 9 if each number starts with 67 and no digit appears more than once?

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5. A coin is tossed 3 times and the outcomes are recorded. How many possible outcomes are there?

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6. Given 5 flags of different colours, how many different signals can be generated if each signal requires the use of 2 flags, one below the other?

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Exercise 7 2

1. Evaluate

$8!$

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2. Evaluate

$4! - 3!$

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3. Is 3! + 4! = 7!?

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4. Compute $\frac{8!}{6! \times 2!}$

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5. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, find x

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6. Evaluate $\frac{n!}{(n-r)!}$, when

n = 6, r = 2

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7. Evaluate $\frac{n!}{(n-r)!}$, when

n = 9, r = 5

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Exercise 7 3

1. How many three digit number can be formed using digits 1-9 no digits are repeating?

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2. How many 4-digit numbers are there with no digit repeated?

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3. How many 3-digit even numbers can be made using the digits 1,2,3,4, 6, 7, if no digit is repeated?

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4. Find the number of 4-digit numbers that can be formed using the digits 1, 2, 3, 4, 5 if no digit is repeated. How many of these will be even?

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5. From a committee of 8 persons, in how many ways can we choose a chairman and a vice chairman assuming one person can not hold more than one position?

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6. Find n if ${}^{n-1}P_3 : {}^{n}P_4 = 1:9.$

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7. Find r if ${}^5P_r = 2^6 P_{r-1}$

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8. Find r if ${}^5P_r = {}^6P_{r-1}$

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9. How many words, with or without meaning, can be formed using all the letters of the word EQUATION, using each letter exactly once?

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10. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if.

(i) 4 letters are used at a time, (ii) all letters are used at a time,

(iii) all letters are used but first letter is a vowel?

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11. In how many of the distinct permutations of the letters in MISSISSIPPI do the four I's not come together?

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12. In how many ways can the letters of the word PERMUTATIONS be arranged if the

(i) words start with P and end with S, (ii) vowels are all together,

(iii) there are always 4 letters between P and S?

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Exercise 7 4

1. If ${}^{n}C_{8} = {}^{n}C_{2}$, find ${}^{n}C_{2}$.

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2. Determine n if

$^{2n}C_3 : {}^nC_3 = 12:1$.

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3. Determine n if

$^{2n}C_3 : {}^nC_3 = 11:1$

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4. How many chords can be drawn through 21 points on a circle?

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5. In how many ways can a team of 3 boys and 3 girls be selected from 5 boys and 4 girls?

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6. Find the number of ways of selecting 9 balls from 6 red balls, 5 white balls and 5 blue balls if each selection consists of 3 balls of each colour.

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7. Determine the number of 5 card combinations out of a deck of 52 cards if there is exactly one ace in each combination.

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8. In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers?

9. A bag contains 5 black and 6 red balls. Determine the number of ways in which 2 black and 3 red balls can be selected.

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

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Miscellaneous Exercise On Chapter 7

1. How many words, with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of the word DAUGHTER ?

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2. How many words, with or without meaning, can be formed using all the letters of the word EQUATION at a time so that the vowels and consonants occur together?

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3. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consists of:

(i) exactly 3 girls ? (ii) atleast 3 girls ? (iii) atmost 3 girls ?

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4. If the different permutations of all the letter of the word EXAMINATION are listed as in a

dictionary, how many words are there in this list before the first word starting with E ?

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5. How many 6-digit numbers can be formed from the digits 0, 1, 3, 5, 7 and 9 which are divisible by 10 and no digit is repeated ?

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6. The English alphabet has 5 vowels and 21 consonants. How many words with two different vowels and 2 different consonants can be formed from the alphabet ?

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7. 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?

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8. Determine the number of 5-card combinations out of a deck of 52 cards if each selection of 5 cards has exactly one king.

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9. It is required to seat 5 men and 4 women in a row so that the wom even places. How many such arrangements are possible ?

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10. From a class of 25 students, 10 are to be chosen for an excursion party. There are 3 students who decide that either all of them will join or none of them will join. In how many ways can the excursion party be chosen ?

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11. Find the number of ways of arranging the letters of the word ASSOCIATIONS. In how many of them i) all the three S's come together ii) The two A's do not come together.

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