

# Permutation

## PERMUTATION COMBINATION

- Permutation is defined as the arrangement of things by taking some or all at a time
- Permutation is order dependent
- **Fundamental principle of counting;**  
If one operation can be performed in 'm' ways and another operation can be performed in 'n' ways, then the total number of ways in which both the operation can be performed will be given by 'm×n' ways
- **Definition of Factorial 'n', i.e., n! or  $\underline{n}$**   
Factorial n (n!) is defined as the continued product of first n natural numbers or first n positive integers and is expressed as  $n! = 1 \times 2 \times 3 \times 4 \times \dots \times n$
- $\underline{n} = n \times \underline{n-1} = n \times (n-1) \underline{n-2} = \dots$
- |      |     |       |         |
|------|-----|-------|---------|
| 1! = | 1   | 6! =  | 720     |
| 2! = | 2   | 7! =  | 5040    |
| 3! = | 6   | 8! =  | 40320   |
| 4! = | 24  | 9! =  | 362880  |
| 5! = | 120 | 10! = | 3628800 |
- **Mathematical definition of Permutation (Repetition not allowed):**  
Total number of arrangements of 'n' different things taking "r" at a time will be given by  ${}^n P_r$  or  $P(n, r) = \frac{\underline{n}}{\underline{n-r}}$ , where  $r \leq n$ .

**Note:**

- When  $r = n$ , it is known as "all at a time"
- When  $r < n$ , it is known as "some at a time"
- r can never exceed n
- n and r must be positive integers
- ${}^n P_1 = n$
- ${}^n P_0 = 1$
- ${}^n P_n = n!$
- ${}^n P_n = {}^n P_{(n-1)}$
- But  ${}^n P_r \neq {}^n P_{(r-1)}$

- **Permutation or arrangements of 'n' different things in which few are alike (Repetition not allowed)**

The total number of arrangements of n different things in which p are alike and of one kind, q are alike and a second kind, r are alike and yet of another kind and the rest are different, will be given by  $\frac{n!}{p!q!r!}$

- **Permutation when repetitions are allowed**

The total number of arrangements of n things taken r at a time when each thing may be repeated once, twice, thrice, ..... to r number of times will be given by  $n^r$

- **Rules for restricted Permutation**

- Whenever the arrangements should begin or end or begin and end with a particular letter or object keep the objects fixed at the respective places and arrange the rest.
- When in the arrangement of n things, r things are together, the total arrangements will be given by:  $(n - r + 1)! r!$
- When in the arrangements of n things, r things are together in a specified order, the total arrangement will be given by  $(n - r + 1)!$
- Total number of ways in which out of n things, r things are never together = total ways – number of ways when they are always together, i.e.,  $n! - (n - r + 1)! r!$
- When the relative positions of few objects are to be kept unaltered it implies that the objects can be interchanged or arranged in their respective place only.
- In problems involving re-arrangements always subtract 1 from the total arrangements.
- When in the arrangement of n things, r alike things are together, then total number of arrangements will be given by  $(n - r + 1)!$

### **Circular Permutation (When the things are arranged in a ring or circle)**

- Total ways in which n things can be arranged in a ring or circle is  $\frac{n!}{n}$
- Total ways in which n things can be arranged in a ring or circle with respect to any object will be given by  $\frac{n!}{n}$
- When the clockwise or anti clock wise position cannot be disguised (for example: arrangements of different flowers in garland or arrangement of different beads in a necklace etc), in such a case the total number of circular arrangements will be given by  $(n - 1)! / 2$

**Arrangements of digits**

- There are 10 random digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
- 5 odd digits (1, 3, 5, 7, 9) and
- 5 even digits (0, 2, 4, 6, 8)
- Unless otherwise mentioned no number can start with '0'
- If there are 'n' different digits (0 is included) then the total number of n digit numbers not beginning with 0 will be given by:  $|n - |n-1$
- If there are n different digits (0 is included) and we are to form a number with r different digits then the total number of r digit numbers not beginning with 0 will be given by:  ${}^n P_r - {}^{n-1} P_{r-1}$

**Fundamental Principle of Counting**

1. There are 10 trains moving between Calcutta and Delhi. In how many ways can a man go from Calcutta to Delhi and return by a different one?
  - a) 100
  - b) 90
  - c) 120
  - d) None of the above
  
2. There are four bus lines between A & B and there are 3 bus lines between B & C. In how many ways can a man take round trips by bus from A to C by way of B, if he does not want to use a bus line more than once?
  - a) 36
  - b) 24
  - c) 72
  - d) 120

3. There are 26 stations on a railway line. How many different kinds of tickets of class II must be printed in order that a passenger may go from any one station to another by purchasing a ticket.
- a) 65
  - b) 240
  - c) 650
  - d) 1300
4. In a class after every student had sent greeting cards to the other student, it was found that 1,640 cards were exchanged. Find the number of students in the class.
- a) 40
  - b) 39
  - c) 41
  - d) 42
5. There are 7 vacant chair in a room and three person enter the room, in how ways can they be arranged on these 7 chairs.
- a) 35
  - b) 210
  - c) 152
  - d) 160

**Formula Pattern -  ${}^n P_r$** 

6.  ${}^n P_5 = 20 \times {}^n P_3$ , then  $n =$
- a) 7
  - b) 6
  - c) 9
  - d) 8
7.  ${}^n P_3 : {}^n P_2 = 3:1$ , then the value of  $n$  is:
- a) 4
  - b) 5
  - c) 6
  - d) 7

8.  ${}^{2n+1}P_{n-1} : {}^{2n-1}P_n = 3 : 5$ , find the value of  $n$ .
- a) 4
  - b) 6
  - c) 8
  - d) 10
9.  ${}^{n+r}P_2 = 110$ ,  ${}^{n-r}P_2 = 20$ , then find  $n$  &  $r$ .
- a) 8, 4
  - b) 8, 3
  - c) 4, 8
  - d) 8, 5
10.  ${}^{n+1+r}P_2 = 72$ ;  ${}^{n-r}P_2 = 12$ , find  $n$  &  $r$ .
- a) 6, 6
  - b) 6, 4
  - c) 6, 2
  - d) 6, 1
11. The value of  $1.1! + 2.2! + 3.3! + \dots + n.n!$  is:
- a)  $\frac{(n+1)-1}{2}$
  - b)  $\frac{(n+2)-1}{2}$
  - c)  $\frac{(n-1)-1}{2}$
  - d) None of the above

**General Linear Permutation – Repetition not allowed**

12. Find how many words can be formed by taking letters from the following word MYSORE taking (i) all at a time (ii) 4 at a time (iii) 3 at a time?
- a) 720, 360, 120
  - b) 360, 720, 120
  - c) 120, 720, 360
  - d) None of the above
13. Find how many words can be formed by taking letters from the following word ARTICLE taking (i) all at a time (ii) 4 at a time (iii) 3 at a time?
- a) 5040, 840, 210
  - b) 840, 5040, 210
  - c) 210, 5040, 840
  - d) None of the above
14. Find how many words can be formed by taking letters from the following word DAUGHTER taking (i) all at a time (ii) 4 at a time (iii) 3 at a time?
- a) 40320, 1680, 336
  - b) 1680, 40320, 336
  - c) 336, 1680, 40320
  - d) None of the above
15. How many (i) 5 digit no (ii) 6 digit no (iii) 8 digit no can be formed with the digit 1, 2, 3, 4, 5, 6, 7, 8?
- a) 6720, 20160, 40320
  - b) 5720, 20161, 40324
  - c) 4720, 20164, 5040
  - d) None of the above

There are 5 letters and 5 addressed envelopes

16. In how many ways the letters can be put into the envelopes?
- a) 3!
  - b) 4!
  - c) 5!
  - d) None of These
17. In how many arrangements all the letters are correctly placed?
- a) 0
  - b) 1
  - c) 2
  - d) None of the above
18. Find the total no of ways in which exactly one letter is wrongly placed?
- a) 0
  - b) 1
  - c) 2
  - d) None of the above

**Alike Items – Repetition not allowed**

Find the number of arrangements that can be made out of the letters of the following words:

19. ATLANTIC
- a) 18000
  - b) 10080
  - c) 18020
  - d) 15950
20. MATHEMATICS
- a) 4989600
  - b) 4998960
  - c) 5987590
  - d) 4545450
21. INSTITUTION
- a) 554499
  - b) 445588
  - c) 554400
  - d) None of the above

**Repetition Allowed**

In how many ways can 5 prizes be given to

22. 4 boys

- a)  $5^4$
- b)  $5^5$
- c)  $4^5$
- d) None of the above

23. 5 boys

- a)  $5^5$
- b)  $4^5$
- c)  $5^4$
- d) None of the above

24. 6 boys

- a)  $5^6$
- b)  $6^5$
- c)  $6^4$
- d) None of the above

25. In how many ways can 8 prizes be given to 3 boys?

- a)  $3^7$
- b)  $8^3$
- c)  $3^8$
- d) None of the above

26. In how many ways can 3 prizes be given to 8 boys?

- a)  $3^6$
- b)  $8^3$
- c)  $3^8$
- d) None of the above



27. In how many ways can 20 different dates can any of the 7 days of the week?
- a)  $20^7$
  - b)  $7^{20}$
  - c) Both of a) and b) above
  - d) None of the above

In how many ways the results of:

28. 10 matches be declared when each match ends in a win, loss or a draw?
- a)  $3^{10}$
  - b)  $10^3$
  - c)  $22^3$
  - d)  $3^{22}$

29. In how many ways can 10 balls be distributed into 3 boxes?
- a)  $10^3$
  - b)  $3^{10}$
  - c) 30
  - d) None of the above

30. In how many ways can 'n' biscuits be given to 'N' persons?
- a)  $N^N$
  - b)  $N^n$
  - c)  $n^n$
  - d)  $n^N$

31. A telegraph post has 5 arms and each arm is capable of 4 distinct positions including the position for rest. What is the total number of signals that can be made?
- a) 1024
  - b) 2048
  - c) 720
  - d) 1023

32. In how many ways can 3 persons enter into 4 hotels if (i) repetition is allowed, and (ii) repetition is not allowed?
- a)  $3^4, 3^4$
  - b)  $4^3, P(4,3)$
  - c)  $3^4, P(4,3)$
  - d) None of the above
33. How many 3 digit nos. can be formed with the 3,1 and 9?
- a) 9
  - b) 12
  - c) 27
  - d) 81
34. In how many ways can 4 children have their birthday in any 4 of the 365 days in a year?
- a) 365
  - b)  $365^2$
  - c)  $365^3$
  - d)  $365^4$
35. There are 'm' men and 'n' monkeys. If a man has any number of monkeys, but a monkey may have only one master, then in how many ways may every monkey have a master?
- a) Mn
  - b)  $n^n$
  - c)  $m^n$
  - d)  $n^m$
36. Find the number of different signals that can be made with 20 flags, 4 flags each of 5 different colours, if 4 flags are required to make a signal?
- a) 560
  - b) 625
  - c) 480
  - d) 240

**Restricted Permutation**

You are given the letters of the word "MONDAY". Find the number of arrangements in the following cases:

37. Without any restriction.
- a) 120
  - b) 144
  - c) 720
  - d) 360
38. Words beginning with M
- a) 120
  - b) 240
  - c) 360
  - d) 720
39. Words ending with Y
- a) 24
  - b) 120
  - c) 96
  - d) 144
40. Words beginning with M & ending with Y
- a) 24
  - b) 96
  - c) 144
  - d) 240
41. Words beginning with M & not ending with Y
- a) 24
  - b) 96
  - c) 360
  - d) 144

42. M & Y are at the two extremes
- a) 24
  - b) 48
  - c) 96
  - d) 144
43. Vowels are together
- a) 120
  - b) 144
  - c) 240
  - d) 360
44. Vowels are together in the given order
- a) 144
  - b) 240
  - c) 120
  - d) 480
45. Vowels are never together
- a) 480
  - b) 240
  - c) 360
  - d) 144
46. Vowels occupy odd places
- a) 480
  - b) 240
  - c) 120
  - d) 144

47. Vowels occupy even places
- a) 240
  - b) 156
  - c) 144
  - d) 360
48. Relative position of the vowels and the consonants are to be kept untouched
- a) 96
  - b) 48
  - c) 56
  - d) 144
49. Consonants are together
- a) 96
  - b) 120
  - c) 144
  - d) 240
50. How many words can be formed by taking four letters at a time?
- a) 240
  - b) 120
  - c) 360
  - d) 700
51. In how many of these (given in previous question) M is always included?
- a) 240
  - b) 120
  - c) 360
  - d) 144

52. In how many of these (given in Q. No. 50) M is excluded?
- a) 240
  - b) 360
  - c) 120
  - d) 144
53. Find the number of rearrangements of the word "Monday".
- a) 720
  - b) 719
  - c) 360
  - d) 717
54. Find the number of words that can be formed by considering all possible permutations of the letters of the word 'FATHER'. How many of these words begin with A and end with R?
- a) 720, 48
  - b) 720, 24
  - c) 360, 48
  - d) 360, 24
55. How many words can be formed of the letters in the word COSTING, the vowels being not separated?
- a) 144
  - b) 1440
  - c) 1280
  - d) 2880

Consider words formation with the letters of the word DELHI

56. How many arrangements can be formed with letters of the word DELHI?
- a) 120
  - b) 24
  - c) 96
  - d) 48
57. How many of them will begin with D
- a) 96
  - b) 24
  - c) 48
  - d) 100
58. How many do not begin with D?
- a) 48
  - b) 24
  - c) 96
  - d) 120
59. In how many words LH will be together?
- a) 12
  - b) 24
  - c) 48
  - d) 96
60. How many arrangements of the letters of the word 'COMRADE' can be made (i) if the vowels are never separated; (ii) if the vowels are to occupy only odd places.
- a) 600,576
  - b) 600,120
  - c) 120,144
  - d) None of the above

61. In how many ways can 8 sweets of different size be distributed among 8 boys of different ages, so that the largest sweet always goes to the youngest boy? [Assume that each boy gets a sweet]
- a) 2520
  - b) 1240
  - c) 5040
  - d) None of the above

You are given the letters of the word BALLOON. Find the following arrangements:

62. Without any restriction.
- a) 960
  - b) 1060
  - c) 1160
  - d) 1260
63. Two LL will always come together.
- a) 720
  - b) 360
  - c) 180
  - d) 120
64. Two LL and two OO will always come together.
- a) 360
  - b) 480
  - c) 180
  - d) 120
65. All the O's & the L's will come together.
- a) 120
  - b) 184
  - c) 144
  - d) 168



66. Vowels are together.

- a) 180
- b) 120
- c) 360
- d) 240

67. B & N are together.

- a) 180
- b) 120
- c) 360
- d) 240

68. B & N are never together.

- a) 900
- b) 980
- c) 160
- d) 720

69. B, N & O's are together.

- a) 288
- b) 142
- c) 144
- d) 368

All different words formed by the letters of the word BHARAT:

70. How many different words can be formed with the letters of the word BHARAT?

- a) 720
- b) 360
- c) 180
- d) 240

71. In how many of these B and H are never together?
- a) 360
  - b) 180
  - c) 240
  - d) 120
72. How many of these begin with B and end with T?
- a) 15
  - b) 12
  - c) 18
  - d) 21
73. How many different words can be formed with the letters of the word CAPTAIN? In how many of these C and T are never together?
- a) 2520, 1600
  - b) 2520, 1890
  - c) 2520, 1800
  - d) 3250, 1800
74. In how many ways can the letters of the word ALGEBRA be arranged? In how many of these arrangements will the two A's not come together?
- a) 2520, 1890
  - b) 2520, 1800
  - c) 3250, 1800
  - d) None of the above
75. In how many different ways can the letters of the word "CONSTITUTION" be arranged? How many of these will have the letter N both at the beginning and at the end?
- a) 9979200, 151200
  - b) 9989920, 152150
  - c) 9979000, 151000
  - d) None of the above

76. In how many ways can the letters of the word AGARTALA be arranged?
- a) 1600
  - b) 1800
  - c) 1980
  - d) 1680
77. Taking data from the previous question, In how many of these will the 4 A's (i) come together, (ii) not come together?
- a) 120, 1560
  - b) 360, 1620
  - c) 300, 1500
  - d) 220, 1380
78. In how many different ways can the letters of the word VIDYAPITH be arranged ?  
How many of these arrangements begin with V but do not end with H?
- a) 181000,17600
  - b) 181400,17640
  - c) 181440,17640
  - d) 182000,18600
79. In how many ways can 5 dots (.) and 3 crosses (x) be arranged in a row?
- a) 36
  - b) 46
  - c) 66
  - d) 56
80. A library has 5 copies of 1 book, 4 copies of each of the 2 books, 6 copies of each of the 3 books and single copies of 8 books. In how many ways can all the books be arranged?
- a)  $\frac{39!}{5!(4!)^2(6!)^3}$
  - b)  $\frac{39!}{8!} \times (4!)^2 \times (6!)^3$
  - c)  $39! (4!)^2 \times (6!)^3$
  - d) None

**Circular Permutation**

81. In how many ways 8 persons can be seated at a round table?
- a) 5040
  - b) 40320
  - c) 2020
  - d) 2520
82. In how many ways can 7 persons be arranged at a round table so that 2 particular persons can be together?
- a) 180
  - b) 240
  - c) 360
  - d) None of the above
83. In how many ways can 4 MBA & 4 MCA be seated at the round table so that no 2 MBA students are adjacent?
- a) 12
  - b) 24
  - c) 96
  - d) 144
84. In how many ways 8 persons can be seated at a round table, with respect to the table?
- a) 40320
  - b) 5040
  - c) 720
  - d) None of the above
85. In how many of the arrangements, as given in the previous question, do 3 particular persons sit side by side?
- a) 4320
  - b) 5040
  - c) 720
  - d) 1400

86. 3 boys and 3 girls are to be seated at a round table. Among these, the boy "X" does not want any girl neighbour and the girl "Y" does not want any boy neighbour. How many arrangements are possible?
- a) 10
  - b) 12
  - c) 8
  - d) 4
87. Find the no. of ways in which 5 beads can be arranged to form a necklace
- a) 12
  - b) 24
  - c) 36
  - d) 48
88. In how many ways 8 stones of different colours be arranged on a ring? In how many of these arrangements red and yellow beads being separated?
- a) 2520, 900
  - b) 2520, 1800
  - c) 1800, 2520
  - d) 1800, 1260
89. 20 persons are invited to a party. In how many ways can they and host be seated at a circular table? In how many of these 2 particular persons be seated on either side of the host?
- a)  $(18!), 2(20!)$
  - b)  $(18!), (20!)$
  - c)  $(20!), (18!)$
  - d)  $(20!), 2(18!)$

A round table conference is to be held for a committee of 7 persons which includes President and Secretary. Find the no of ways the committee can be seated so that

90. The President and Secretary can sit together
- a) 120
  - b) 240
  - c) 360
  - d) 480

91. The Secretary sits on the right side of the President
- a) 120
  - b) 240
  - c) 360
  - d) 480
92. The President and the Secretary do not sit together
- a) 120
  - b) 240
  - c) 360
  - d) 480
93. In how many ways can 6 ladies and 6 gents be arranged at a round table, if the two particular ladies Miss X and Miss Y refuse to sit next to Mr. Z, all men being separated?
- a) 1278
  - b) 1730
  - c) 1728
  - d) 34560

**Problem involving Digits**

94. How many (i) 8 digit no (ii) 5 digit no (iii) 4 digit no (iv) 3 digit no can be formed with the digit 0,1,2,3,4,5,6,7?
- a) 35280, 5880, 1470, 294
  - b) 5880, 1740, 4294, 294
  - c) 294, 1470, 5880, 35280
  - d) None
95. How many 6 digit nos. can be formed with 3, 4, 5, 6, 7, & 8 (no digits are repeated)? How many of these are (i) divisible by 5 (ii) not divisible by 5.
- a) 720, 120, 600
  - b) 720, 600, 120
  - c) 780, 600, 180
  - d) 780, 180, 600

96. How many 4 digit nos. can be formed with the digits 0, 1, 2, 3, 4, 5, ..... and 9 (repetition not allowed)?
- a) 9000
  - b) 4536
  - c) 3654
  - d) 2635
97. In the above question, if repetition is allowed then find the number of ways it can be done?
- a) 4536
  - b) 3654
  - c) 2598
  - d) 9000
98. How many numbers can be formed with the digits 1, 2, 3, 4, 3, 2, 1, so that odd digits are at odd places?
- a) 18
  - b) 19
  - c) 20
  - d) None
99. How many four digits numbers can be formed with the digits 3, 4, 5, 6? Find the sum of all the numbers thus formed.
- a) 24, 1420
  - b) 24, 1520
  - c) 24, 4742
  - d) 24, 119988

100. How many 3 digit nos. are there, with distinct digits, with each digit odd?
- a) 30
  - b) 60
  - c) 90
  - d) 120
101. Find the total number of numbers divisible by 2 which can be formed with the six digits 1, 2, 4, 5, 6 and 7.
- a) 180
  - b) 360
  - c) 720
  - d) 120
102. How many different nos. can be formed by using any four of the nine digits 1, 2, 3, 4, 5 ..... and 9 such that their numbers will (i) begin with a specified digit (ii) begin with a specified digit and end with a specified digit?
- a) 336, 24
  - b) 336, 42
  - c) 360, 42
  - d) 360, 24
103. How many 5 digit nos. can be formed with the digits 2, 3, 5, 7, and 9 which are (i) greater than 30000; (ii) less than 70000: (iii) lies between 30000 and 90000?
- a) 96, 72, 72
  - b) 96, 96, 72
  - c) 96, 96, 96
  - d) 72, 72, 96
104. How many numbers greater than 4000 can be formed with the digits 2, 3, 4, 5 and 6 when no digit is repeated?
- a) 216
  - b) 212
  - c) 192
  - d) 180



105. How many numbers of four different digits each greater than 4000 can be formed from the digits 2, 3, 4, 6, 7 and 0?
- a) 160
  - b) 180
  - c) 150
  - d) 240
106. How many numbers of 4 different digits greater than 5000 can be formed from the digits 2, 4, 5, 7, 8 and 0?
- a) 180
  - b) 360
  - c) 240
  - d) 120
107. How many nos. between 300 and 3000 can be formed with the digits 0, 1, 2, 3, 4 and 5 (no digit being repeated in any number)?
- a) 180
  - b) 120
  - c) 160
  - d) 240
108. How many numbers can be formed with the digits 1, 2, 3, 4 and 5; which are greater than 3400?
- a) 180
  - b) 120
  - c) 160
  - d) 360
109. How many numbers greater than a million (10 lakhs) can be formed with the digits 2, 3, 0, 3, 4, 2, and 3?
- a) 240
  - b) 180
  - c) 540
  - d) 360

110. How many even numbers greater than 300 can be formed with the digits 1, 2, 3, 4 and 5 (no digit being repeated)?
- a) 121
  - b) 111
  - c) 222
  - d) 124

**Miscellaneous**

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111. How many ways can 3 boys and 5 girls be arranged in row so that no 2 boys are together?
- a) 14400
  - b) 604800
  - c) 2880
  - d) 28800
112. In how many ways can 5 boys and 4 girls be arranged in a row so that the boys and the girl stand alternately?
- a) 28800
  - b) 14400
  - c) 2880
  - d) 60480
113. A dinner is arranged for 11 guests in which there are 4 children, 1 old man and 6 adults. They are to be arranged in a row for a dinner. The 4 children wish to occupy 2 seats at each end corner seats and the old man refuses to have a child on his either side. In how many ways can all guests be arranged?
- a) 28800
  - b) 43200
  - c) 86400
  - d) 14400

114. In how many ways can 5 boys and 5 girls be arranged in a row so that they stand alternately?

- a) 14400
- b) 2880
- c) 604800
- d) 28800

115. A, B, C, D, E are suppose to speak in a meeting. In how many ways can they be arranged so that A & B speak next to each other.

- a) 48
- b) 49
- c) 56
- d) None

116. A Speaks immediately before B

- a) 24
- b) 120
- c) 12
- d) None

117. A speaks always before B

- a) 60
- b) 6
- c) 120
- d) None

Find the number of ways in which ten candidates,  $A_1, A_2, A_3, A_4, \dots, A_{10}$  can be ranked

118. If  $A_1$  and  $A_2$  are next to each other

- a) 727560
- b) 725860
- c) 725760
- d) 758960

119.  $A_1$  is just above  $A_2$
- a) 362770
  - b) 362880
  - c) 359660
  - d) 352990
120. If  $A_1$  is always above  $A_2$ .
- a) 184400
  - b) 144000
  - c) 189500
  - d) 181440
121. In how many ways can the letters of the word PARNECIOUS be rearranged without changing the order of the vowels?
- a) 33590
  - b) 30239
  - c) 14400
  - d) 28800
122. In how many ways one can arrange 10 letters taken 7 at a time. In how many of these 3 particular letters (i) always occur, and (ii) never occurs?
- a) 720, 30240
  - b) 30240, 5040
  - c) 5040, 5040
  - d) 176400, 5040
123. If the number of permutation of "n" different things taken 4 at a time, in which 1 particular thing does not occur, is equal to the number in which it does occur, find the value of "n".
- a) 2
  - b) 4
  - c) 6
  - d) 8