

## Permutation & Combination

Date Planned : __ / __ / __	Daily Tutorial Sheet - 11	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Numerical Value Type for JEE Main	Exact Duration : _____

- 201.** Consider a rational number  $\frac{a}{b}$  in its lowest form  $a, b$  are integers, with  $0 < \frac{a}{b} < 1, b > 1$ . How many of these have  $ab = 15!$ ?
- 202.** How many integers are there between 0 and  $10^5$  having the digit sum equal to 8?
- 203.** At a couple dance party, each man danced with exactly four women and each woman danced with exactly three men. Nine men attended the party. How many women attended the party?
- 204.** There are eight rooms on the first floor of a hotel, with four rooms on each side of the corridor, symmetrically situated (that is each room is exactly opposite the other room). Four guests have to be accommodated in four of the eight rooms (that is, one in each) such that no two guests are in adjacent rooms or in opposite rooms. In how many ways can the guests be accommodated.
- 205.** There are five cities A, B, C, D, E on a certain island. Each city is connected to every other city by road. In how many ways can a person starting from city A come back to A after visiting some cities without visiting a city more than once and without taking the same road more than once. (The order in which he visits the cities also matters)
- 206.** A, B are two students in a group of  $n$  students. If the number of ways of assigning the  $n$  students to a line of  $n$  single rooms such that A and B are not in adjacent rooms is 3600, then  $n$  is equal to:
- 207.** The number of three digits numbers of the form  $xyz$  such that  $x < y$  and  $z \leq y$  is:
- 208.** If three dice are rolled and we make a set of numbers shown on the three dice. How many different sets are possible?
- 209.** Let  $0 < a < b < c < d < e < f < g$  be a geometric sequence of integers. Let  $*$  ( $k$ ) denote the number of divisors of  $k$ . For example,  $*(6) = 4$  because 1, 2, 3, 6 are divisors of 6. If  $*(a) = 7, *(g) = 13$  and  $d - c = 432$ . Then find the value of  $b$ :
- 210.** Let  $N$  be number of ways four different integers be chosen from the set  $\{1, 2, 3, 4, \dots, 104, 105\}$  so that their sum is divisible by 4, then  $\left\lfloor \frac{N}{10^5} \right\rfloor$  is equal to: ([.] denote greatest integer function)
- 211.** All the 7-digit numbers containing each of the digits 1, 2, 3, 4, 5, 6, 7 exactly once and not divisible by 5, are arranged in the increasing order. Let  $N$  be the 2018<sup>th</sup> number in this list, then the last digit of  $N$  is:
- 212.** Let  $N$  be the number of 6-digit numbers such that the digits of each number are all form the set  $\{1, 2, 3, 4, 5\}$  and any digit that appears in the number appears atleast twice. Then the last digit of  $N$  is:
- 213.** Find the number of eight-digit numbers the sum of whose digits is 4.
- 214.** The number of order triplets  $(a, b, c)$  such that  $\text{LCM}(a, b) = 1000, \text{LCM}(b, c) = 2000$  and  $\text{LCM}(c, a) = 2000$  is:
- 215.** A class contains three girls and four boys. Every Saturday, five students go on a picnic, a different group being sent each week. During the picnic, each girl in the group is given a doll by the accompanying teacher. After all possible groups have gone once, the total number of dolls the girls have got is equal to: