Practice sheet on Combinatorics

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Type-1:

(i) Using each digit only once in each number how many significant odd numbers containing five digits can be formed with the digits 6, 5, 2, 3, 0?

(ii) Using each digit only once in each number how many significant even number containing five digits can be formed with the digits 5, 3, 2, 6, 0?

Type-2:

(i) The digits from 0 to 9 is written in the telephone dial. All the telephone numbers in the town of Cox's Bazar contain 5 digits. How many connections of telephones can be made in that town?

(ii) 15 letters in each of 3 rings of a lock are printed. If the lock can be opened by only one permutation of three letters, then find the number of permutations by which the lock cannot be opened.

(iii) How many numbers of three digits can be formed with the digits 1, 2, 3, 4, 5 so that any digit may be repeated any number of times in each numbers? How many of these numbers have the same digit twice or thrice?

Type-3:

(i) In how many ways can the letters of 'Equation' be arranged by using all the letters at a time?

(ii) In how many ways can the letters of the word 'TRIANGLE' be arranged so that the vowels do not come together?

(iii) Find the number of arrangements of the letters of the word 'Mathematics'. In how many of these arrangements the vowels remain together?

(iv) In how many ways can the letters of the word 'MILLENNIUM' be arranged? How

many of them begin with 'M' and also end with 'M'?

(v) In how many ways can the letters of the word 'Permutation' be re-arranged so that the positions of vowels are not changed?

Type-4:

(i) How many different words taking letters at a time can be formed from the letters of the word Cambridge' so that each word contains all the vowels?

(ii) How many different words consisting of 3 consonants and 2 vowels can be formed from 12 different consonants and 5 different vowels?

(iii) How many different words by taking 1 vowel and 2 consonants from the letters of the word "Permutation" can be formed where the vowel always stays in the middle?

Type-5:

(i) How many teams of 11 players can be formed from 14 players of which 6 are experienced bowlers so that each team consists of at least 5 experienced bowers?

(ii) From two groups of players of which 6 are in one group and 8 are in the other group, a cricket team of 11 players is to be formed so that each team consists of at least 4 players from the group of 6. In how many ways can that team be formed?

(iii) From 6 students having Mathematics and 4 students having Physics, a committee of 6 is to be formed so that the majority of members of the committee is taken from the students having Mathematics. In how many ways can the committee be formed?

Type-6:

(i) An examinee is required to answer 6 questions out 12 questions. He will have to select exactly 4 questions out of 5 questions from the beginning. In how many ways can he select the questions?

(ii) Question paper on Mathematics has been divided into two groups, each group contains 5 questions. An examinee is required to answer 6 questions taking not more than 4 questions from any group. In how many ways can the examinee select

questions?

Type-7:

(i) In how many ways can the letters of the word "Degree" taking 4 letters at a time be selected?

(ii) In how many ways can selections be made by taking 4 letters at a time from the letters of the word "Thesis"?

(iii) How many words can be formed by taking 3 letters at a time from the letters of the word 'America'?

Type-8:

(i) How many triangles can be formed by joining the angular points of a polygon containing 17 sides?

(ii) How many triangles can be formed by joining the angular points of a polygon containing 12 sides. Find the number of diagonals of this polygon.