SEMINAR LESSON 5

Elements of Combinatorics

1) We call a natural number "cute", if only odd digits are found in its record. How many 4-digit "cute" numbers exist?
2) The Mumbo-Yumbo alphabet consists of three letters A, B and C. A word is any sequence consisting of no more than 4 letters. How many words are in the language of the Mumbo-Yumbo tribe?
3) How many ways can we make a tricolor flag with horizontal stripes of the same width, if there is a matter of six different colors?
4) There are 20 cities in the country, every two of which are connected by an airline. How many airlines are there in this country?
5) Necklace is a ring, on which beads are strung. Necklace can be turned, but do not turn over. How many different necklaces can be made from 13 different beads?
6) How many 6-digit numbers exist, in the records of which there is at least one even digit?
7) There are six letters in the Bum-Bum alphabet. A word is any sequence of six letters in which there are at least two identical letters. How many words are in the language of the Bum-Bum tribe?
8) How many ways from a full deck (52 cards) you can choose 4 cards of different suits and advantages?
9) Which 7-digit numbers are greater: those in the record that have 1, or the others?
10) The cube is thrown three times. Among all possible sequences of results there are those in which at least once there is a six. How many of them?
11) How many ways can you break 14 people into pairs?
12) How many 9-digit numbers exist, whose sum of digits is even?
13) *Find the sum of all 7! numbers, which can be obtained by all possible permutations of digits in number 1234567.
14) *Find the number of ways in which from the set 1, 2, ..., 49 you can choose six different numbers so that at least two of them are consecutive.