1. 10 different letters of an alphabet are given. Words with 5 letters are formed from the given letters. Find the number of words which have at least 1 letter repeated.

2. If x and y are positive integers and r is an integer such that $r \leq \min(x, y)$, what is the value of the following expression?

$$^{x}C_{r} \; + \; ^{x}C_{r-1} \cdot {}^{y}C_{1} \; + \; ^{x}C_{r-2} \cdot {}^{y}C_{2} \; + \; \ldots \; + \; {}^{y}C_{1}$$

3. What is the number of parallelograms that can be formed from a set of 4 parallel lines intersecting another set of 3 parallel lines?

4. Given three straight lines l_1, l_2, l_3 that are parallel and lie in the same plane. m points are taken on l_1, n on l_2 and k on l_3. How many triangles can be formed with vertices on these points?

5. Show that product of any n consecutive integers is divisible by $n!$.

6. Everybody in a room shakes hands with everybody else. The total number of handshakes is 66. Find the total number of people in the room.

7. Letters of the word BRIGHT are arranged in dictionary order. What is the rank of BRIGHT? What is the word having rank 349?

8. A 5 digit number divisible by 3 is to be formed using the numberals 0,1,2,3,4,5 without repetitions. What is the total number of ways in which this can be done?

9. 4 women and 5 men from a group of 10 women and 9 men are to be selected to form a committee. However Mr. A refuses to serve the committee if Mr. B is present. Find the maximum number of ways to form the committee.

10. What is the total number of permutations of 4 letters that can be made out of letters of the word EXAMINATION?