

## **Assignments for HSC 1st year students**

*Subject: Higher Mathematics 1<sup>st</sup> paper*

Name of the topic: Permutations and combinations

Answer the following questions:

1. In how many ways can the letters of the word 'ALLAHABAD' be arranged? In how many of them the four A will occur together? In how many of them the vowels will be in even places?
2. Show that, the number of permutation of word 'CHALLENGE' is 36 times that of 'PROTECT'.
3. How many odd numbers of 5 significant digits can be formed with digits can be formed with the digits 6, 5, 2, 3, 0 using each digits only once in a number?
4. Prove that,  ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$  ( $1 \leq r \leq n$ )
5. Find the number of combinations of the letter of the word 'THESIS' taken 4 letters at a time.
6. In Brothers 'ENGINEERING' Company 5 mechanical engineers and 4 electric engineers are acting.
  - a) There are 4 candidates for a post, one is to be elected by the votes of 7 men. In how many ways can the votes be given?
  - b.) Find the number of arrangements that can be made of the letters of the quoted word so that the consonants may not be consecutive positions in of them.
  - c) In how many ways can a committee of 4 engineers can be formed consisting of at least 1 mechanical engineer and 1 electric engineer.
7. The numbers of teachers in MATHEMATICS and PHYSICS department of The Millennium Stars School & College Rangpur Cantonment are 6 and 5 respectively.
  - a) Find the number of arrangements of the letters of the quoted word taken all at a time.
  - b) In how many ways can the selection be made to form a committee of 8 teachers so as to give a majority of Mathematics teachers in all cases?
  - c) Find number of combinations of the letters of the 1<sup>st</sup> quoted word taken 6 at a time