**Note:-**
1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

## Section A

**Q.1. Select and write the correct answer.** (4)

1. A question paper has two parts, A and B, each containing 10 questions. If a student has a choose 8 from part A and 5 from part B. In how many ways can he choose the questions?

   A) 320          B) 750
   C) 40            D) 11340

2. $^5C_1 + {}^5C_2 + {}^5C_3 + {}^5C_4 + {}^5C_5$ is equal to

   A) 30            B) 31
   C) 32            D) 33

**Q.2. Answer the following.** (3)

1. Find the value of: $^{15}C_4 + {}^{15}C_5$

2. Find the value of : $^{15}C_4$

3. Compute : $\left(\dfrac{12}{6}\right)!$

## Section B
### Attempt any Four

Q.3  Find n, if $\dfrac{(15 - n)!}{(13 - n)!} = 12$ (2)

Q.4  Find the number of triangles formed by joining 12 points if a triangle is formed when 3 non **(2)** collinear points are formed.
Four points are collinear.

Q.5  Find n, if $\dfrac{n}{8!} = \dfrac{3}{6!} + \dfrac{1!}{4!}$ (2)

Q.6  Find the number of seating arrangements for 3 men and 3 women to sit around a table so that **(2)** exactly two women are together.

Q.7  A school has three gates and four staircases from the first floor to the second floor. How many **(2)** ways does a student have to go from outside the school to his classroom on the second floor?

Q.8  Find the number of arrangements of letters in the word CONSTITUTION that begin and end **(2)** with N.

## Section C
### Attempt any Two

**Q.9** Find the differences between the greatest values in the following : $^{13}C_r$ and $^8C_r$ **(3)**

**Q.10** Find the number of words that can be formed by using all the letters in the word REMAIN. If **(3)** these words are written in dictionary order, what will be the $40^{th}$ word?

**Q.11** Find the value of $\displaystyle\sum_{r=1}^{4} {}^{(21-r)}C_4$ **(3)**

## Section D
### Attempt any One

**Q.12** Find the number of different ways of arranging letters in the word PLATOON if **(4)**
(a) The two O's are never together        (b) Consonants and vowels occupy alternate positions

**Q.13** Find the number of different arrangements of letters in the word MAHARASHTRA. How many of **(4)** these arrangements have
(a) Letters R and H never together?
(b) All vowels together?