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Assignment.

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Q.2 In how many ways can the letters of the word 'ABACUS' be arranged such that

(1) The vowels always appears together.

(2) Begins with 'A' and ends with 'S'.

→ (1) There are 3 vowels in the given word. So now there will be 3 vowels and 3 other remaining letters.

∴ Formation : (AAU) BCS.

(AAU) will be 1 element & B C S are 3 elements.

These 4 elements can be arranged in 4! ways.

But A appears twice

$$\therefore \text{Arrangement} : \frac{3!}{2!} = 3$$

∴ Hence by the fundamental principle of multiplication, required number of words are,

$$4! \times \frac{3!}{2!} = \frac{4 \times 3 \times 2 \times 3 \times 2!}{2!}$$

$$= 72.$$

Word ABACUS can be arranged in 72 ways if vowels appears together.

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(5) Begin with 'A' & ends with 'S'

There are 6 letters in the given word of which 2 are 'A's and the remaining are distinct. Remaining 4 letters between A & S can be arranged in $\frac{4!}{2!}$ ways.

∴ Total numbers of words starting with A and ending with S are,

$$\frac{4!}{2!} = \frac{4 \times 3 \times 2!}{2!} = 12 \text{ ways}$$

ABACUS word when starts with A and end with S then it can be arranged in 12 ways.