1. **If the letters of the word ALGORITHM are arranged at random in a row what is the probability the letters GOR must remain together as**

Given word is ALGORITHM

$\Rightarrow$ Total number of letters in algorithm = 9

$\therefore$ Total number of words = 9!

So, n(S) = 9!

If 'GOR' remain together, then we consider it as one group.

$\therefore$ Number of letters = 7

Number of words, if 'GOR' remain together in the order = 7!

So, n (E) = 7!

$$\text{Required Probability} = \frac{\text{Number of favourable outcome}}{\text{Total number of outcomes}}$$

$$= \frac{n(E)}{n(S)}$$

$$= \frac{7!}{9!} \quad [\because n! = n \times (n-1) \times (n-2)...1]$$

$$= \frac{7!}{9 \times 8 \times 7!} = \frac{1}{72}$$