Average

1) Average of two or more numbers/quantities is called the mean of these numbers, which is given by

Average(A) = $\dfrac{\textit{Sum of observations / quantities}}{\textit{No of observations /quantities}}$

-----or-----

S = A × n

2) If the given observations (x) are occurring with Certain frequency (A) then,

$$\text{Average} = \frac{A_1 x_1 + A_2 x_2 + \ldots\ldots + A_n x_n}{x_1 + x_2 + \ldots\ldots\ldots + x_n}$$

3) The average of 'n' consecutive natural numbers starting from 1 i.e.
Average of 1,2,3, ...n = $\dfrac{n+1}{2}$

(Average is always the middle number)

4) The average of squares of 'n' consecutive natural numbers starting from 1 i.e.

$$\text{Average of } 1^2,\ 2^2,\ 3^2,\ 4^2 \ldots\ldots x^2 = \frac{(n+1)(2n+1)}{6}$$

5) The average of cubes of first 'n' consecutive natural numbers i.e.

$$\text{Average of } 1^3,\ 2^3,\ 3^3 \ldots\ldots n^3 = \frac{n(n+1)^2}{4}$$

6) The average of first 'n' consecutive even natural numbers i.e.
Average of 2, 4, 6, ... 2n = (n + 1)

7) The average of first 'n' consecutive odd natural numbers i.e.
1, 3, 5, ... (2n − 1) = n

8) The average of certain consecutive numbers
a, b, c, ... n is = $\dfrac{a+n}{2}$

9) If the average of 'n1' numbers is a1 and the average of 'n2' numbers is a2, then average of total numbers n1 ,n2 is

Weighted Average = $\dfrac{a1n1 + a2n2}{n1 + n2}$

10) If A goes from P to Q with speed x km/h and returns from Q to P with speed y km/h, then the average speed of total journey is

Average speed = $\dfrac{2xy}{x+y}$ = $\dfrac{\textit{Total Distance}}{\textit{Total time}}$

11) If a distance is travelled with three different speeds x km/h, y km/h and z km/h, then

Average speed of total journey =$\frac{3xyz}{xy+yz+xz}$ km/h

12**) Average of bowler =$\frac{Total\ Runs}{No\ of\ Wickets}$**

Total runs = Average (A). y, where y = Number of wickets.

13) If any set of numbers (A) contains the same numbers then the average of that set A is that number.
 e.g. If Set A =(5,5,5,5,5) then average of set A is 5

14) If each number in given set is increased by a then average of that set is also increased by a.
e.g. set A=(5,10,15,20,25) = Average is 15
 Now Suppose is each number is increased by 1 then ,
    Set A will = (6,11,16,21,26) = New average is 16

15) If a new number(observations) is add added to the given set which is equal to the current average then the new average remains same.
e.g. Set A =(5,10,15,20,25) = Average 15
New Set A as =(5,10,15,20,25,15) = New Average 15 does not change

16) If a new number(observations) is add added to the given set which is not equal to the current average then the new average will increase .
e.g. Set A =(5,10,15,20,25) = Average 15
New Set A as =(5,10,15,20,25,21) = New Average will change i.e. will increase by 1 =16