Unweighted

1) Simple aggregate Method :-

This is the simplest method of constructing Index Numbers.

Symbolically,

$$P_{01} = \frac{\Sigma P_1}{\Sigma P_0} \times 100.$$

where

P_{01} is the price index number for the current year with reference to the base year.

ΣP_1 is Aggregate of prices for the current year.

ΣP_0 is Aggregate of prices for the base year.

Example:

1).

Commodity	Price	
	1990	1991
A	90	95
B	40	60
C	90	110
D	30	35

construct an index number for 1991 taking 1990 as base.

Ans : $P_{01} = 120$.

2) Simple average of price relative method :-

A price relative is the price of the current year expressed as a percentage of the price of the base year.

Symbolically,

$$P_{01} = \frac{\left(\frac{P_1}{P_0} \times 100\right)}{N} = \frac{\Sigma P}{N} \; ; \; N = \text{number of items}$$

Example:

Compute price index by average of price relative method for the following data.

Commodity	A	B	C	D	E	F
Price in 1986 (Rs)	20	30	10	25	40	50
Price in 1991 (Rs)	25	30	15	35	45	55

Ans: 122.92

Weighted Index Numbers:

This is of two types. They are

1) Weighted Aggregate index number

According to this method, prices themselves are weighted by quantities; ie., $p \times q$.

Some of the important formulae are as follows.

(a) Laspeyre's Method

In this method, the base year quantities are taken as weights.

$$\text{ie., } P_{01(La)} = \frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times 100.$$

(b) Paasche's Method

In this method, the current year quantities are taken as weights.

$$\text{ie., } P_{01(Pa)} = \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1} \times 100$$

(c) Bowley Doofish Method

This is an index number got by the arithmetic mean of Laspeyre's and Paasche's methods.

$$\text{i.e., } P_{01(B)} = \frac{\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1}}{2} \times 100.$$

(d) Fisher Ideal Method

Fisher's price index number is given by the geometric mean of Laspeyre's and Paasche's formula.

$$\text{i.e., } P_{01(F)} = \sqrt{\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1}} \times 100.$$

This is known as Ideal index number.

(e) Marshall Edgeworth Method

In this method, the arithmetic mean of base year and current year quantities is taken as weights. i.e., $w = \frac{q_0 + q_1}{2}$.

$$\therefore P_{01(Ma)} = \frac{\Sigma p_1 (q_0 + q_1)}{\Sigma p_0 (q_0 + q_1)} \times 100$$

(or)

$$P_{01(Ma)} = \left(\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} + \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1} \right) \times 100$$

(f) Kelley's Method

This methods uses quantities of some period as weights. This weight is kept constant for all periods.

$$\therefore P_{01(K)} = \frac{\Sigma p_1 q}{\Sigma p_0 q} \times 100, \text{ where } q = \frac{q_0 + q_1}{2}.$$

(g) Walsch's Method

This method uses the geometric mean of the base year and current year quantities as weights.

$$\therefore P_{01(WA)} = \frac{\Sigma p_1 \sqrt{q_0 q_1}}{\Sigma p_0 \sqrt{q_0 q_1}} \times 100.$$

Example:

Calculate index number from the following data.

Items	Base Year		Current Year	
	kilo	Rate	kilo	Rate
Bread	10	3	8	3.25
Meat	20	15	15	20
Tea	2	25	3	23

* Laypeyre's Method
* Paasche's method
* Bowley's Method
* Fisher ideal formula
* Marshall edgeworth method.