SYLLABUS
Class: - B.Com. (Hons.) I Year

Subject: - Business Organization and Communication

Unit-1	Average, Ratio and Proportion, Percentage
Unit-2	Profit and Loss, Simple Interest, Compound Interest

UNIT-I
AVERAGE

The average of the number of quantities of observations of the same kind is their sum divided by their number. The average is also called average value or mean value or arithmetic mean.

$$\text{Average} = \frac{\text{Sum of terms}}{\text{Number of terms}}$$

For observations x1 ,x2, x3, ……xn

$$\text{Average} = \frac{x_1 + x_2 + x_3 + \ldots\ldots\ldots\ldots + x_n}{n}$$

Functions of Average

a) To present the salient features of data in simple and summarized form
b) To compare and draw conclusion
c) To get a simple value that describes the characteristics of the entire group
d) To help in statistical analysis

Merits of Average

a) Simple and rigid definition
b) Based on all observations
c) Use in analysis because of further algebraic treatment

Demerits of Average

a) Sometimes it is not a true representation of data
b) Sometimes it may give absurd results
c) It cannot be obtained by observation
d) It can be affected by extreme values

RATIO

A ratio can exist only between two quantities of the same type. If x and y are any two numbers and $y \neq 0$ then the fraction $\frac{x}{y}$ is called the ratio of x and y is written as x:y.

Characteristics of Ratio –

The following characteristics are attributed to ratio relationship:

i) Ratio is a cross relation found between two or more quantities of same type.
ii) It must be expressed in the same units.
iii) By the fraction laws a ratio can be expressed as below:

$$\frac{y}{x} = x:y$$

$$\frac{10}{5} = 10:5 \text{ or } 2:1$$

iv) A ratio expresses the number of times that one quantity contains another.
v) Two or more ratios may be compared by reducing their equivalent fractions to a common denominator.

Different types of Ratio –

Ratio can be divided into following ways –

1) Unit Ratio – When homogeneous items are same on the basis of unit, it is called unit ratio.

For example – Ram and Shyam are getting Rs. 5 each.

$\frac{x}{y} = \frac{5}{5}$ *or* 5: 5 *or* 1: 1

2) Duplicate Ratio – When the homogeneous items are shown in unit with square, it is called duplicate ratio.
   For Example, 2:3 square means 2^2:3^2 or 4:9
3) Triplicate ratio – When homogenous item is multiplied by 3, it is known as triplicate ratio.
   For example, 2^3:3^3 = x2x2x2:3x3x3 8:27
4) Sub triplicate ratio – When ratio is expressed in cube root it is known as sub triplicate ratio.
   For example, $\sqrt[3]{8}$: $\sqrt[3]{27}$ = 2:3
5) Ratio of greater in equality – In this type of ratio the first item of given ratio is greater than other items.
   For example, 8:3, 13:8.
6) Ratio of less in equality – When first item of given ratio is less than the other items of ratio, it is called ratio of less of equality.
   For example, 2:7, 5:12, 1:3
7) Equality ratio – In this type of ratio first item is equal to other item of ratio.
   For example, 5:5, 8:8, 12:12

Proportion

Relationship between the two ratio's is called proportion. Here, quantity ratio of first two items is equality to rest two terms.

For example, 2:5::6:15

Proportion is expressed by four parallel points (::).

In the simple proportion here its not necessary that two items of first ratio and the items of second ratio should be homogeneous. But the items of second set of ratio have the same relationship which is found between the items of first ratio. For example 2:5::6:15. Here 5 is 2.5 times of 2 in case of first ratio. In the same 15 is 2.5 times of 6 in the second set of ratio.

Characteristics of Proportion –

i) Proportion is given in four parts. So first number is known as first item, second number is second item, third number is third item and fourth number is known as fourth item.
ii) First and fourth items are known as extremes items and second and third items are known as mean items.
iii) It is not necessary in proportion that all four items should be homogenous. But the ratios of first and second and third and fourth should be the same.

Types of Proportion –

1) **Continued proportion** –
   If ratio of items is going on continuously, e.g., ratio of first and two is equal to two and three and ratio of two and three is equal to three and fourth item and so on, thus, ratio is known as continued ratio.
   For example, $\frac{A}{B} = \frac{B}{C} = \frac{C}{D} = \frac{D}{E} = \frac{E}{F}$ ....
   Here A, B, C, D, E and F are in continued ratio.
2) **Direct Proportion** –
   In this type of ratio, two different items has the such relation that if the one is increased or decreased, another will change accordingly in the same ratio.

Difference Between Ratio and Proportion –

S.No.	Ratio	Proportion
1	There are two terms in a ratio.	There are four terms in a proportion.
2	Comparison of two quantities of same type.	Comparison of two ratios.
3	Two quantities must be of same type.	All four quantities are not of same type but the first two are of one type and the last two may be of another type.
4	There is not a product rule	The product of extremes is equal to product of the means.

PERCENTAGE

Percent and Percentage

When we take of percentage, we usually refer to "for every one hundred."
Actually percentage can be defined as a fractional expression with 100 as its denominator.

When we talk of 10 percentage of a number, we mean 10 parts put of one hundred parts of the number in consider action the word "percentage" can be denoted by the sign (%).

In the above example 10 percentages can be written as 10% or even $\frac{10}{100}$. When written in the form $\frac{10}{100}$, it is in a fraction form whereby the upper number is the numerator and the bottom the denominator. It can further be simplified as –

$$\frac{10}{100} = \frac{1}{10}$$

From the above discussion we can conclude that when dealing with percentage, a number can be expressed as a fraction of percentage, i.e.,

$\frac{10}{100} = \frac{1}{10}$; or it can be written just in percentage form, i.e., 10 percent = 10%.

Change fractions into percentage –

When changing a fraction into a percentage, we just multiply it by 100 and put the sign %.

Example: Express $\frac{1}{10}$ as a percentage = $\frac{1}{10} X \frac{100}{1} = 10\%$

Change percentage into fraction –

To change a percentage given into a fraction, we divide the fraction by 100.

Example: Express 10% as a fraction = $\frac{10}{10} = \frac{1}{10}$

To find percentage of quantity with another quantity –

Let x and y be two quantities of same type and rate percentage r, such that

$$r\ \%\ of\ x = y$$

or

$$x.\frac{r}{100} = y$$

$$r = \frac{y\,X\,100}{x}$$

i.e., Rate percent = $\frac{The\ quantity\ which\ represent\ in\ percent}{Second\ quantity}\ X\ 100$

Example: What percent Rs. 20 of Rs. 350?

Solution: r% $\frac{20X100}{350} = 5\frac{5}{7}$

To find the quantity when rate percent and percentage value are known –

If rate percent value are given then

Quantity = $\frac{Percent\ value\ X\ 100}{Rate\ percent}$

UNIT-II
SIMPLE INTEREST

Interest – Interest is the money which the lender of a sum receives from the borrower, in consideration of the borrower using the sum.

Usually money is given out by lenders and the borrowers have to pay interest when it falls due. When it is said on this basis, we call it Simple Interest.

Definitions of Usual Words –

1) ***Interest*** – If a businessman borrows some money from a bank and in consideration for the use of money so borrowed, he pays the bank something apart from the principal amount, this consideration paid is interest.
2) ***Principal Amount*** – This is the amount which is given as credit to the borrower. It is the lent out sum of money.
3) ***Amount*** – When the interest has been added to be principal amount, the total is known as amount.
4) ***Time*** – This is the duration in which the principal amount has been taken by the borrower. It may be monthly, quarterly, half yearly, yearly etc. Interest is calculated on the basis of time.
5) ***Rate of Interest*** – This is the interest charged for one unit of principal for a specific period, e.g. 1 year.

Formula for the Calculation of Simple Interest –

When calculating simple interest, we take into account the following terms –

1) Principal - denoted as P
2) Rate of interest- - denoted as R
3) Interest - denoted as I
4) Amount - denoted as A
5) Time - denoted as T

i) When calculating **Interest**,

$$I = \frac{P \times R \times T}{100}$$

ii) When calculating **Time**,

$$T = \frac{I \times 100}{P \times R}$$

iii) When calculating **Principal**,

$$P = \frac{I \times 100}{R \times T}$$

iv) When calculating **Rate**,

$$R = \frac{I \times 100}{P \times T}$$

v) When calculating **Amount**,

$$A = P + \frac{P \times R \times T}{100}$$

or $$A = P \times \left(1 + \frac{R \times T}{100}\right)$$

or $$A = P + I$$

Meaning of Compound Interest –

By compound interest we mean when interest becomes due after a certain period, it is added to the principal amount and interest on succeeding years is based on the principal and the interest added. The difference between the amount and the original principal is called the compound interest.

It means that in compound interest, the principal doesn't remain fixed at the original sum but increase at the end of each interest period. Interest period is the period at which the interest becomes due. It may be a year, half year or quarter year.

Distinction between Simple and Compound Interest –

S.No.	Basis of Difference	Simple Interest	Compound Interest
1	Principal and Interest	Calculated on original amount	Calculated with interest included
2	calculation of interest	Calculated on overall period in single time.	Calculated yearly, half yearly, quarterly or even monthly.
3	Principal Amount	Always same on whole period.	Changes from year to year, month to month etc.
4	Difference in amount of interest	Less than that of compound interest.	It is more than that of small interest.

Methods for Calculation of Compound Interest –

The following are some of the methods used to calculate compound interest –

1) Simple interest method.
2) Interest table method.
3) Decimal point method.
4) Compound interest formula method.
5) By Logarithm method.

1) Simple Interest Method –

When the time of the interest is not so long, i.e.; when interest is calculated for only a few years then we use this method. It is just similar to that used to find out simple interest. Follow the steps below –

i) Calculate interest on principal at the end of every year.
ii) Add the interest got in step (i) above to the original principal. This amount is principal for the next year.
iii) Calculate compound interest by adding each year's interest for the entire period.
iv) Finally subtract the original from the compounded amount and this gives the compound interest.

2) Compound Interest Formula Method –

When the number of year involved to calculate the compound interest are many, we use the above method. The formula used is –

$$A = P\left(1 + \frac{R}{100}\right)^n$$

Where P denotes = Principal (original)
n = number of years (interest period)
r = rate of interest (in percentage)
A = Amount after *n* years.

MEANING IMPORTANT FORMULAE RELATED WITH PROFIT AND LOSS

When we are given cost price and selling price, we can formulate some formula related with them. We can abbreviate the two as below –

Cost Price = C.P.
Selling Price = S.P.

1) Gain % on cost = $\frac{S.P. - C.P.}{C.P.} \times 100$

$\frac{Gain \times 100}{Cost\ Price}$

2) Loss % on cost = $\frac{C.P. - S.P.}{C.P.} \times 100$

$\frac{Net\ Loss}{C.P.} \times 100$

3) Gain % on sales = $\frac{S.P. - C.P.}{S.P.} \times 100$

$\frac{Gain}{S.P.} \times 100$

4) Loss % on sales = $\frac{C.P. - S.P.}{S.P.} \times 100$

$\frac{Loss}{S.P.} \times 100$