

## 9. COMMERCIAL MATHEMATICS



### Let's Study

- Percentage
- Profit and Loss
- Interest (Simple and Compound)
- Depreciation
- Partnership
- GST
- Shares and Dividends

### Let's Discuss

#### 9.1 Percentage:

Percentage is one of the most important concept in commercial arithmetic. Calculation abilities can be developed through the study of percentage. The word percentage literally means for every 100 and it is derived from the French word cent, which means hundred.

#### Mathematical explanation.

If a student scores 20 marks out of maximum 30 marks, his marks can be denoted as 20 out of 30 or  $\frac{20}{30}$  or 66.66 percent or 66.66%



### Let's Learn

Percentage is useful for comparison of two or more fractions. This can be shown with the help of following table.

Student	Full Marks	Marks Obtained
A	100	72
B	50	41
C	150	111

In the given table performance of the student cannot be judged with the help of only marks. If we calculate the marks of all the students over one common base 100, that is marks, out of 100 marks then their marks are :

Student	Full Marks	Marks Obtained
A	100	72
B	100	82
C	100	74

This represents the percentage marks of student. Now we can compare marks of three students and rank them

Rank	I	II	III
Student	B	C	A



### Let's Remember

Finding percentage: Quick calculations of conversion of fraction into percentage and percentage into fraction is very important. To convert a fraction or decimal into percentage we multiply the number by 100. To convert percentage to fraction or decimal, we divide the number by 100

*Always remember, a% of b is equal to b% of a*

*e.g. 20% of 50 = 10 and 50% of 20 = 10*

*∴ 20% of 50 is equal to 50% of 20*

#### Important formulae

1. Percentage increase =

$$\frac{\text{Increase in Quantity}}{\text{Original Quantity}} \times 100$$

2. Percentage decrease =  $\frac{\text{Decrease in Quantity}}{\text{Original Quantity}} \times 100$
3. To increase a number by  $x\%$  multiply it by  $\frac{100+x}{100}$
4. To decrease a number by  $x\%$  multiply it by  $\frac{100-x}{100}$
5. If A's income is  $r\%$  more than B's income then B's income is less than A's income by  $\frac{r}{100+r} \times 100\%$ .
6. If A's income is  $r\%$  less than B's income then B's income is more than A's income by  $\frac{r}{100-r} \times 100\%$ .
7. If price of a commodity increases by  $x\%$  then to keep the expenses same the consumption must be reduced by  $\frac{x}{100+x} \times 100\%$ .
8. If price of a commodity decreases by  $x\%$  and expenses are same, the consumption can be increased by  $\frac{x}{100-x} \times 100\%$ .

### SOLVED EXAMPLES

- 1) After a discount of 12% a TV is available for Rs. 26,400. If the discount is 3% more, price of TV is Rs. 25,500. What is the original price of the TV?  
**Solution:** 3% of the cost of the TV =  $26400 - 25500 = 900$   
 Total cost of TV =  $900 \times \frac{100}{3} = 30000$
- 2) The price of sugar is increased by 20%. What should be the percentage change in the consumption of sugar so that the expenses does not increase?

**Solution:** Assume that the initial price = 100

Initial consumption = 100

Total expenditure = 10000

New price 120

$$\text{So consumption} = \frac{10000}{120} = 83.33$$

$\therefore$  Percentage decrease in consumption is =  $100 - 83.33 = 16.67$

### EXERCISE 9.1

1. Find 77% of 580 + 34% of 390.
2. 240 candidates appeared for an examination, of which 204 passed. What is the pass percentage?
3. What percent of 8.4 kg is 168 grams?
4. If the length of a rectangle is decreased by 20%, what should be the increase in the breadth of the rectangle so that the area remains the same?
5. The price of rice increased by 20%, as a result a person can have 5kg rice for Rs 600. What was the initial price of rice per kg?
6. What percent is 3% of 5%?
7. After availing two successive discounts of 20% each, Madhavi paid Rs 64 for a book. If she would have got only one discount of 20%, how much additional amount would she have paid?
8. Price of table is 40% more than price of a chair. By what percent price of chair is less than price of a table?
9. A batsman scored 92 runs which includes 4 boundaries 5 sixes. He scored other runs by running between the wickets. What percent of his total score did he make by running between the wickets?

## 9.2 Profit and Loss

### Let's Discuss

**Profit:** Profit is earned when an article is sold for more than its cost price.

Tax is computed and dividend is paid on the basis of profit. It is the best measure of success in an enterprise.

Profit is reflected in reduction in liabilities, increase in assets, and/or increase in owners' equity. It provides resources for investing in future operations, and its absence may result in the extinction of a company.

**Loss:** A loss occurs when an article is sold for less than its cost price.

Profits and losses are normally expressed as a percentage of cost price.



### Let's Learn

#### Cost Price:

The price, at which an article is purchased, is called its *cost price*, abbreviated as *C.P.*

#### Selling Price:

The price, at which an article is sold, is called its *selling price*, abbreviated as *S.P.*

#### Profit or Gain:

If *S.P.* is greater than *C.P.*, the seller is said to have a *profit* or *gain*.

**Loss:** If *S.P.* is less than *C.P.*, the seller is said to have incurred a *loss*.

**Loss or gain is always calculated on C.P. and discount is given on MRP or marked price.**



### Let's Remember

1.  $\text{Gain} = (\text{S.P.}) - (\text{C.P.})$
2.  $\text{Loss} = (\text{C.P.}) - (\text{S.P.})$
3. Gain Percentage: (Gain %)  
$$\text{Gain \%} = \frac{\text{Gain} \times 100}{\text{C.P.}}$$

4. Loss Percentage: (Loss %)

$$\text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}}$$

5. Selling Price (S.P.) when there is Gain.

$$\text{S.P.} = \frac{100 + \text{gain \%}}{100} \times \text{C.P.}$$

6. Selling Price (S.P.) when there is Loss.

$$\text{S.P.} = \frac{100 - \text{loss \%}}{100} \times \text{C.P.}$$

7. Cost Price (C.P.) when there is Gain.

$$\text{C.P.} = \frac{100}{100 + \text{gain \%}} \times \text{S.P.}$$

### Let's Understand

1. If an article is sold at a gain of 35%, then  $\text{S.P.} = 135\%$  of *C.P.*
2. If an article is sold at a loss of 35% then  $\text{S.P.} = 65\%$  of *C.P.*
3. When a person sells two similar items, one at a gain of  $x\%$ , and the other at a loss of  $x\%$ , then the seller always incurs a loss given by:

$$\begin{aligned} \text{Loss \%} &= \left( \frac{\text{common loss and gain \%}}{10} \right)^2 \\ &= \left( \frac{x}{10} \right)^2 \end{aligned}$$

4. Sometimes a seller claims to sell goods at cost price. But he uses a false weight. Then he earns profit.

To find profit percent

$$= \frac{\text{Error}}{\text{True value} - \text{Error}} \times 100$$

For example, if a trader buys rice at Rs 50 per kg. And sells it at the same price. But while selling, he uses 950 gm weight instead of 1000 gm. Here gain is equal to the cost of 50gm rice.

In the above example gain %

$$= \frac{50}{1000 - 50} \times 100 = 5.26$$

Gain = 5.26%

### SOLVED EXAMPLES

**Ex. 1 :** Determine whether there is profit or loss in following examples Find its percentage

a) If cost price is 3800 and selling price is 4560.

b) If CP is 3800 and SP is 3420

**Solution:** a)  $CP < SP$ . Profit =  $4560 - 3800 = 760$

$$\text{Profit percent} = \frac{760}{3800} \times 100 = 20$$

Profit = 20%

b)  $CP > SP$  Loss =  $3800 - 3420 = 380$

$$\text{Loss percent} = \frac{380}{3800} \times 100 = 10$$

Loss = 10%

**Ex. 2 :** Ketan sold a mobile phone at a price of Rs. 5250 at a loss of 25%. At what price should he sell it to get a profit of 30%?

**Solution:**

$$CP = \frac{100}{75} \times 5250 = 7000$$

$$SP = \frac{130}{100} \times 7000 = 9100$$

He should sell it at Rs. 9100 to get a profit of 30%

**Ex. 3 :** If selling price of 30 apples is equal to the cost price of 25 apples. What is the profit or loss percentage?

**Solution:**

Let cost price of one apple Rs 1

CP of 30 apples = Rs. 30

CP of 25 apples = Rs. 25

SP of 30 apples = CP of 25 apples

i.e.  $SP = \frac{5}{6} CP$  i.e.  $CP > SP$

30 CP – 30 SP

$30 - 25 = 5$  Loss

(30 SP = 25 CP) given

$$\text{Loss percent} = \frac{5}{30} \times 100 = 16\frac{2}{3}$$

$$\text{Loss} = 16\frac{2}{3} \%$$

**Ex. 4 :** In a toy shop a doll was sold for Rs. 27.50 with a profit of 10%. If it was sold for Rs. 25.75 then what would have been the percentage of profit or loss ?

**Solution:** SP = Rs. 27.50

Profit = 10 %

$$CP = \frac{100}{110} \times 27.50 = 25$$

when SP = 25.75, profit =  $25.75 - 25 = 0.75$

$$\text{Profit \%} = \frac{0.75}{25} \times 100 = 3$$

Profit = 3%

**Ex. 5 :** The price of a television set passing through distributor, wholesaler and retailer rises on a whole by 51.8%. If distributor and wholesaler earned 10% and 15% respectively. what is the percentage profit owned by the retailer ?

**Solution:** Let the original price of television be Rs.  $p$  and let the profit earned by the retailer be  $x$ . Then  $(100 + x) \%$  of 115% of 110% of  $p = 151.8\%$  of  $p$

$$\therefore \frac{100 + x}{100} \times \frac{115}{100} \times \frac{110}{100} \times p = 151.8/100 \times p$$

$$\therefore 100 + x = \frac{151.8 \times 100 \times 100}{115 \times 110} = 120$$

$$\therefore x = 20 \text{ Retailer earned } 20 \%$$

### EXERCISE 9.2

- 1) Mr. Sarad purchased a laptop for Rs. 24000 and sold it for Rs. 30000. What was the profit percentage?
- 2) Shraddha purchase mobile phone and refrigerator for Rs. 18000 and 15,000 respectively. She sold the refrigerator at a loss of 20% and mobile at a profit of 20%. What is her overall profit or loss ?
- 3) A vendor bought toffees at 6 for Rs.10. How many for Rs.10 must he sell to gain 20% ?
- 4) The percentage profit earned by selling an article for Rs. 2880 is equal to the percentage loss incurred by selling the same article for Rs. 1920. At what price the article should be sold to earn 25% profit?
- 5) A cloth merchant advertises for selling cloth at 4% loss. By using faulty meter scale, he is earning profit of 20%. What is the actual length of the scale?
- 6) Sunil sells his bike worth Rs. 25000 to Rohit at a profit of 20%. After 6 months Rohit sells the bike back to Sunil at a loss of 20%. Find the total profit percent of Sunil considering both the transactions.
- 7) By selling a book at Rs. 405 bookseller incurs a loss of 25%. Find the cost price of the book.
- 8) A cloth costs Rs. 675. If it is sold at a loss of 20%, what is its cost price as a percentage of its selling price ?
- 9) Ashwin buys an article for Rs. 500. He marks it for sale at 75% more than the cost price. He offers 25% discount on marked price to his customer. Calculate the actual percentage of profit made by Ashwin.
- 10) The combined cost price of a refrigerator and a mixture is Rs. 12400. If the refrigerator costs 600% more than the mixer, find the cost price of the mixture.
- 11) Find the single discount equivalent to the discount series of 5%, 7% and 9%.
- 12) The printed price of a shirt is Rs. 390. Lokesh pays Rs. 175.50 for it after getting two successive discounts. If the first discount is 10%, find the second discount.
- 13) Amar, a manufacturer, gives a discount of Rs. 25% on the list price to his distributor Akbar, Akbar sales at 10% discount on the list price to his customer Anthony. Anthony paid Rs 540 for the article. What is profit percentage of Akbar on his cost price ?
- 14) A man sells an article at a profit of 25%. If he had bought it at 10% less and sold it for Rs 7 less, he would have gained 35%. Find cost price of the article.
- 15) Mr Mehta sold his two luxury cars at Rs. 39,10,000 each. On one he gains 15% but on the other he loses 15%. How much does he gain or lose in the whole transaction ?

### 9.3 Interest: Simple and Compound Interest

#### Definition of Interest:

1. Interest is defined as the cost of borrowing money. Interest is charged on the loan balance. And it is specified as an amount per cent per annum (pcpa)
2. Interest is fee paid for the use of another party's money.

To the borrower it is the cost of renting money.

To the lender it is the income from the lending money.

Interest can also be the rate paid for money on deposit.

Interest is calculated in two ways:

Simple interest and Compound interest

**Simple interest:** Interest calculated only on the principal or original amount of loan.

**Compound interest:** Interest calculated on the principal amount and also on the accumulated interest of previous years.

The difference between simple interest and compound interest will be clear from the following example.

A sum of Rs 1000 at 10% per annum have

Simple interest	Period	Compound interest
Rs 100	1st year	Rs 100
Rs 100	2nd year	Rs 110
Rs 100	3rd year	Rs 121
Rs 100	4th year	Rs 133

Note that the previous year's interest are added to the original sum of Rs. 100 to calculate the compound interest.

### Important terms :

**Creditor :** The person who lends money.

**Debtor :** The person who borrows money.

**Principal / capital :** The amount of money which is borrowed or deposited.

**Time :** The period for which money is deposited or borrowed is called time.

**Amount :** The sum of the principal and interest at the end of time is called amount.

**Amount** = principal + interest

**Interest rate:** The interest of one year for every Rs. 100 is called interest rate per annum.

### How to calculate interest ?

#### Case 1. Simple interest:

Suppose P = principal

n = number of years

r = rate of interest p.a.

N = number of periods for compounding

R = rate of interest per compounding period.

I = interest, A = amount

$$\text{Then } I = \frac{P \cdot n \cdot r}{100}$$

$$A = P + \frac{P \cdot n \cdot r}{100} = P \left( 1 + \frac{nr}{100} \right)$$

#### Case 2: compound interest

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

Special cases:

1. When compound interest is calculated half yearly.

Here rate (R) =  $\frac{r}{2}$  % and time (N) = 2n

$$A = \left( 1 + \frac{\frac{r}{2}}{100} \right)^{2n}$$

2. When compound interest is calculated quarterly.

Here rate (R) =  $\frac{r}{4}$  % and time (N) = 4n

$$A = \left( 1 + \frac{\frac{r}{4}}{100} \right)^{4n}$$

3. The difference between compound interest and simple interest over 2 years is given by

$$\frac{pr^2}{100^2}$$

#### case 3. When interest is compounded annually

but time is in fraction. If time is  $4\frac{2}{5}$  years,

$$\text{Then amount (A)} = P \left[ 1 + \frac{R}{100} \right]^4 \times \left[ 1 + \frac{\frac{2}{5}R}{100} \right]$$

**Case 4.** When rates are different for different years. If rates are  $R_1\%$ ,  $R_2\%$  and  $R_3\%$  for first, second and third years respectively.

$$\text{Then amount (A)} = P \left[ 1 + \frac{R_1}{100} \right] \left[ 1 + \frac{R_2}{100} \right] \left[ 1 + \frac{R_3}{100} \right]$$

### SOLVED EXAMPLES

- 1) The simple interest on a sum of money is 36% of the principal and the rate per annum



is equal to the number of years. Find the rate percent

**Solution:** let principal = 100

Interest = 36

$$I = \frac{P N R}{100}$$

$$36 = \frac{100 N R}{100}$$

$$36 = RN$$

Since  $R = N$ ,  $R = 6$ ,  $N = 6$ .

- 2) The rate of interest for the first 2 years is 6% per annum, for next 3 years 7% per annum and for the period beyond five years 8% per annum. If a man lent out Rs. 1500 for 9 years, find the total interest earned by him.

**Solution:** Interest for first two years will be equal to  $6 \times 2 = 12\%$

Interest for next 3 years will be  $3 \times 7 = 21\%$

Interest for next 4 years will be  $4 \times 8 = 32\%$

Total interest =  $12 + 21 + 32 = 65\%$

$$\text{Interest Earned} = \frac{1500 \times 65}{100} = 975$$

- 3) A certain sum of money amounts to Rs. 10,440 in 2 years and Rs. 12,600 in 5 years. Find the principal and the rate of simple interest.

**Solution:** Principal + interest for 5 years

– (Principal + interest for 2 years)

= 0 + interest for 3 years

$12600 - 10440 = \text{interest for 3 years}$

$2160 = \text{interest for 3 years}$

1 years interest = 720

2 years interest = 1440

Principal =  $10440 - 1440 = 9000$

$$r = I \times 100 / P \times n$$

Rate of interest =  $\frac{720 \times 100}{9000 \times 1} = 8\%$  per annum

Principal = 9000, rate = 8% per annum

## SOLVED EXAMPLES

- 1) How much will be the compound interest on Rs. 8000 after 3 years at the rate of 5% per annum.

$$\text{Solution: } A = P \left( 1 + \frac{R}{100} \right)^N = 8000 \left( 1 + \frac{5}{100} \right)^3$$

$$= 8000 \times \frac{105}{100} \times \frac{105}{100} \times \frac{105}{100}$$

$$= 21 \times 21 \times 21 = 9261$$

$$I = A - P = 9261 - 8000 = 1261$$

- 2) Find the compound interest on Rs. 10000 at 8% per annum for 2 years 6 months compounded annually.

**Solution:**  $P = 10000$

$$n = 2.5 = \frac{5}{2}$$

$R = 8\%$  per annum

$n = 2$  years and half year

$$A = P \left( 1 + \frac{R}{100} \right)^N = 100 \left( 1 + \frac{8}{100} \right)^2 \left( 1 + \frac{4}{100} \right)$$

$$= 12130.56$$

$$\text{Interest} = A - P = 12130.56 - 10000 = 2130.56$$

- 3) The compound interest on a certain sum for 2 years at 10% per annum is Rs. 1050. Find the principal.

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

$$\therefore P + 1050 = P \left( 1 + \frac{10}{100} \right)^2$$

$$1050 = \left( P \times \frac{110}{100} \times \frac{110}{100} \right) - P = P \left( \frac{21}{100} \right)$$

$$\frac{1050 \times 100}{100} = p = 5000$$

Principal = 5000

### EXERCISE 9.3

- 1) What would be the simple interest on an amount of Rs. 9600 at the rate of 6% per annum after 3 years?
- 2) What would be the simple interest at the rate of  $9\frac{1}{2}$  % per annum on Rs. 6000 for  $2\frac{1}{2}$  years?
- 3) What would be the simple interest on Rs. 8400 in 9 months at the rate of 8.25 percent per annum?
- 4) What would be the compound interest on Rs 4200 for 18 months at 10% per annum compounded half yearly?
- 5) Find compound interest on Rs.10000 for 2 years at 8% per annum compounded half yearly.
- 6) In how many years Rs. 1,00,000 will become Rs. 1,33,100 at compound interest rate of 10% per annum?
- 7) A certain sum of money becomes three times of itself in 20 years at simple interest. In how many years does it become double of itself at the same rate of simple interest ?
- 8) A person borrows 10000 for 2 years at 4% p a simple interest he immediately lends it to another person at 6.5 % p. a. for 2 years. Find his total gain in the transaction.
- 9) A man deposits Rs 200 at the end of each year in recurring account at 5% compound interest. How much will it become at the end of 3 years?
- 10) A man gets a simple interest of Rs. 2,000 on a certain principal at the rate of 5% p.a. in 4

years. What compound interest will the man get on twice the principal in 2 years at the same rate.

- 11) The difference between simple interest and compound interest on a certain sum of money is Rs.32 at 8% per annum for 2 years. Find the amount.

### 9.4 Depreciation

**Definition of Depreciation :** The monetary value of an asset decreases over time due to use, wear and tear or obsolescence. This decrease is called depreciation. Machinery, equipment, furniture, vehicles are some examples of assets that are likely to depreciate over a specific period of time. We can find out present value of asset, when rate of depreciation is given, by using following formula.

- 1) Present value of Asset =  $V \left(1 - \frac{r}{100}\right)^n$
- 2) Value of Asset n years ago =  $V \div \left(1 - \frac{r}{100}\right)^n$

Where V = Initial value of Asset, r = rate of depreciation, n = number of years.

### SOLVED EXAMPLES

**Ex. 1 :** An engineering firm purchased some equipments at Rs. 10,935. Rate of depreciation is  $11\frac{1}{9}$ . Find the value of the equipments after 3 years.

**Solution :**

Present value of equipments = 10935

Rate of depreciation =  $11\frac{1}{9} = \frac{100}{9}$

Value after 3 years =  $V \left(1 - \frac{r}{100}\right)^n$



$$\begin{aligned}
&= 10935 \left(1 - \frac{100-9}{100}\right)^3 \\
&= 10935 \times \left(1 - \frac{800}{900}\right)^3 \\
&= 10935 \times \frac{8}{9} \times \frac{8}{9} \times \frac{8}{9} \\
&= 15 \times 8 \times 8 \times 8 \\
&= 7680
\end{aligned}$$

∴ Value of the equipments after 3 years  
= Rs. 7680

**Ex. 2** Depreciated value of a machine after 2 years is Rs. 8464. Rate of Depreciation is 8%. Find present value of the machine.

**Solution :**

Value of the machine after 2 years = Rs. 8464

Rate of depreciation = 8%

Let present value of the machine = V

$$\begin{aligned}
\therefore \text{Rs. } 8464 &= V \left(1 - \frac{8}{100}\right)^2 \\
&= V \left(\frac{92}{100}\right)^2
\end{aligned}$$

$$\therefore \frac{8464 \times 100 \times 100}{92 \times 92} = V$$

$$\therefore \frac{8464 \times 25 \times 25}{23 \times 23} = V$$

$$16 \times 25 \times 25 = V$$

$$V = 10,000$$

∴ Present value of the machine = Rs. 10,000

**Ex. 3 :** The value of a machine depreciates from Rs. 23625 to Rs. 15379 in 3 years. What is the rate of depreciation?

**Solution :**

$$\text{Rs. } 15379 = \text{Rs. } 23625 \left(1 - \frac{r}{100}\right)^3$$

$$15379 = 23625 \left(\frac{100-r}{100}\right)^3$$

$$\frac{15379}{23625} = \left(\frac{100-r}{100}\right)^3$$

Divide numerator and denominator by 7

$$\frac{15379/7}{23625/7} = \frac{2197}{3375} = \left(\frac{13}{15}\right)^3 = \left(\frac{100-r}{100}\right)^3$$

$$\therefore \frac{13}{15} = \frac{100-r}{100}$$

$$\therefore 1300 = 1500 - 15r$$

$$15r = 200$$

$$r = \frac{200}{15}$$

$$= 13.33$$

∴ rate of depreciation = 13.33

**Ex. 4 :** Mr. Sharma purchased a car for Rs. 10,00,000/-. He sold his car at depreciated value, Rs. 6,81,472/-. Rate of depreciation is 12%. Find after how many years he sold his car ?

**Solution :**

Purchase price of the car Rs. 10,00,000/-

Value of the car after depreciation = Rs. 6,81,472/-

Rate of depreciation = 12%

$$\therefore 6,81,472 = 10,00,000 \left(1 - \frac{12}{100}\right)^n$$

$$\frac{681472}{1000000} = \left(\frac{88}{100}\right)^n$$

$$\frac{88 \times 88 \times 88}{100 \times 100 \times 100} = \left(\frac{88}{100}\right)^n$$

$$\therefore \left(\frac{88}{100}\right)^3 = \left(\frac{88}{100}\right)^n$$

$$\therefore n = 3$$

### EXERCISE 9.4

- 1) Kanchan purchased a Maruti car for Rs.2,45,000/- and the rate of depreciation is  $14\frac{2}{7}$  % per annum. Find the value of the car after two years?
- 2) The value of a machine depreciates from Rs.32768 to Rs.21,952/- in three years. What is the rate of depreciation ?
- 3) The value of machine depreciates at the rate of 10% every year. It was purchased 3 years ago. Its present value is Rs.2,18,700/-. What was the purchase price of the machine ?
- 4) Mr. Manish purchased a motorcycle at Rs.70,000/-. After some years he sold his motorcycle at exact depreciated value of it that is Rs.51,030/-. Rate of depreciation was taken as 10%. Find after how many years he sold his motorcycle.
- 5) Mr. Chetan purchased furniture for his home at Rs.5,12,000/-. Considering rate of depreciation as 12.5%, what will be value of furniture after 3 years.
- 6) Grace Fashion Boutique purchased a sewing machine at Rs.25,000/-. After 3 years machine was sold at depreciated value Rs.18,225/- Find rate of depreciation.
- 7) Mr. Pritesh reduced value of his assets by 5% each year, which were purchased for Rs.50,00,000/-. Find the value of assets after 2 years.
- 8) A manufacturing company is allowed to charge 10% depreciation on its stock. Initial value of the stock was Rs.60,000/-. After how many years value of the stock will be 39366?

## 9.5 Partnership

### Let's Discuss

**Partnership:** When two or more than two persons run a business jointly, they are called partners and the deal is known as partnership.

### Types of Partners:

**Working Partner:** A partner who invests money and manages the business as well.

**Sleeping Partner:** A partner who simply invests the money but not involved in day today affairs of business.

### Division of Profit/Loss:

- i) When investments of all partners are for the same time but different in amount, the profit or loss is distributed among the partners in the ratio of their amount of investments. Suppose A and B invest Rs X and Rs. Y respectively for a year in a business, then at the end of the year, (A's share of profit) : (B's share of profit)  
 $= X : Y$
- ii) When investments of all partners are for the different time periods but same in amount, the profit or loss is distributed in the ratio of the time period they have invested for. Suppose A and B invest Rs. X each. But after 6 months A withdrew his capital and B continues the same business for a year, then at the end of the year (A's share of profit) : (B's share of profit)  
 $= 6 \text{ months} : 12 \text{ months} = 1 : 2$
- iii) When investments are different in amount and for different time periods. Then profit or loss is distributed in the ratio of (Capital  $\times$  period). Suppose A invests Rs X for P months and B invests Rs. Y for 9 months then (A's share of profit) : (B's share of profit)  
 $= xp : yq$

## SOLVED EXAMPLES

**Ex.1 :** Kajal and Kiran invest in a business in the ratio 10 : 9. If 5% of the total profit goes to charity and Kajal's share is Rs. 2000, what is the total profit ?

**Solution:** Let the total profit be Rs. 100.

After paying to charity, Kajal's share

$$= \left( 95 \times \frac{10}{19} \right) = \text{Rs. } 50$$

If Kajal's share is Rs. 50, total profit

= Rs. 100.

If Kajal's share is Rs. 2000, total profit

$$= \left( \frac{100}{50} \times 2000 \right) = 4000.$$

**Ex.2 :** John, Jani, Janardan started a business with their investments in the ratio 1: 3 :5. After 6 months, John invested the same amount as before and Jani as well as Janardan withdrew half of their investments. Find the ratio of their profits at the end of the year.

**Solution :** Let their initial investments be x, 3x and 5x respectively. Then, their ratio of investment

	A	B	C
For 1 <sup>st</sup> 6 months	x	3x	5x
For next 6 months	+2x	+1.5x	+2.5x
Total	3x	4.5x	7.5x

$\therefore$  ratio = 3 : 4.5 : 7.5 or 2 : 3 : 5

**Ex.3:** Akshay is a working and Bhushan is sleeping partner in a business. Akshay puts in Rs. 15,000 and Bhushan puts in Rs.20,000. Akshay receives 30% of the profit for managing the business and the rest is divided in proportion to their capital. What does each get out of a profit of Rs. 100000?

**Solution :** Total profit = Rs. 1,00,000

Akshay's share for managing the business

$$\text{i.e. } \frac{30}{100} \times 1,00,000 = 30,000$$

Remaining profit of Akshay and Bhushan as per their capital = 1,00,000 – 30,000 = 70,000

Ratio of amounts = 15,000 : 20,000 i.e. 3 : 4

Sum of ratios = 3 + 4 = 7

Akshay's share = 30,000 + 30,000 = 60,000

Bhushan's share = 40,000

**Ex.4:** If 4 (A's capital) = 6 (B's capital) = 10 (C's capital), then out of a profit of Rs. 7750, What is C's share?

**Solution:**

Let 4A = 6B = 10C = k. Then, A = k/4, B = k/6, and C = k/10 .

$$A : B : C = \frac{k}{4} : \frac{k}{6} : \frac{k}{10} = 15 : 10 : 6.$$

Hence, C's share  $(7750 \times \frac{6}{31}) = \text{Rs. } 1500.$

**Ex.5:** Seeta started a business by investing Rs.50,000/-. After six months, Geeta joined her with a capital of Rs.80,000/-. After 3 years, they earned a profit of Rs.24,500/-. What was Seeta's share in the profit ?

**Solution:**

Seeta's investment is for 36 months, Geeta's investment is for 30 months

$$\text{Seeta : Geeta} = (50000 \times 36) : (80000 \times 30) = 3 : 4.$$

$$\begin{aligned} \text{Seeta's share} &= \text{Rs. } \left( 24500 \times \frac{3}{7} \right) \\ &= \text{Rs. } 10500. \end{aligned}$$

## EXERCISE 9.5

- 1) Three partners shared the profit in a business in the ratio 5 : 6 : 7 . They had partnered for 12 months, 10 months and 8 months respectively. What was the ratio of their investments?

- 2) Kamala, Vimala and Pramila enter into a partnership. They invest Rs. 40,000, Rs. 80,000 and Rs. 1,20,000 respectively. At the end of the first year, Vimala withdraws Rs. 40,000, while at the end of the second year, Pramila withdraws Rs. 80,000. In what ratio will the profit be shared at the end of 3 years ?
- 3) Sanjeev started a business investing Rs.25,000 in 1999. In 2000, he invested an additional amount of Rs. 10,000 and Rajeev joined him with an amount of Rs. 35,000. In 2001, Sanjeev invested another additional amount of Rs.10,000 and Pawan joined them with an amount of Rs.35,000. What will be Rajeev's share in the profit of Rs.1,50,000 earned at the end of 3 years from the start of the business in 1999?
- 4) Teena, Leena and Meena invest in a partnership in the ratio:  $7/2, 4/3, 6/5$ . After 4 months, Teena increases her share by 50%. If the total profit at the end of one year is Rs.21,600, then what is Leena's share in the profit?
- 5) Dilip and Pradeep invested amounts in the ratio 2:1, whereas the ratio between amounts invested by Dilip and Sudip was 3:2. If Rs. 1,49,500 was their profit, how much amount did Sudip receive ?
- 6) The ratio of investments of two partners Jatin and Lalit is 11:12 and the ratio of their profits is 2 : 3. If Jatin invested the money for 8 months, find for how much time Lalit invested his money.
- 7) Three friends had dinner at a restaurant.

When the bill was received, Alpana paid  $\frac{2}{3}$  as much as Beena paid and Beena paid  $\frac{1}{2}$  as much as Catherin paid. What fraction of the bill did Beena pay ?

- 8) Roy start a business with Rs. 10000, Shikha joins him after 2 month with 20% more investment than Roy, after 2 month Tariq joins him with 40% less than Shikha. If the profit earned by them at the end of the year is equal to twice the difference between investment of Roy and ten times the investment of Tariq. Find the profit of Roy?
- 9) If  $4(P's \text{ Capital}) = 6(Q's \text{ Capital}) = 10(R's \text{ Capital})$ , then out of the total profit of Rs 5580, what is R's share?
- 10) A and B start a business, with A investing the total capital of Rs.50000, on the condition that B pays A interest at the rate of 10% per annum on his half of the capital. A is a working partner and receives Rs.1500 per month from the total profit and any profit remaining is equally shared by both of them. At the end of the year, it was found that the income of A is twice that of B. Find the total profit for the year?

## 9.6 GST (Goods and Service Tax)



### Let's Recall

We have studied GST in 10<sup>th</sup> standard .We will revise this topic again as this is important in day to day life.

The Central government passed four sets of GST Acts in the Budget session 2017. These were Central GST Act, 2017; Integrated GST Act, 2017; Union Territory GST Act, 2017 and GST (Compensation to States) Act, 2017.



### Let's Learn

#### What is GST?

GST is a comprehensive indirect tax levied on manufacture, sale and consumption of goods as well as services at the national level. It has replaced all indirect taxes levied on goods and services by

state and Central Governments. Businesses are required to obtain a GST Identification Number in every state they are registered.

### Why is GST needed in India?

Introduction of GST is considered to be a significant step in the reform of indirect taxation in India. Amalgamating of various Central and State taxes into a single tax would help avoid the double taxation, a multiplicity of taxes, classification issues, taxable event, etc., and would lead to a common national market.

VAT rates and regulations differ from state to state. On the other hand, GST brings in uniform tax system across all the states. Here, the taxes would be divided between the Central and State government.

### Impact of GST on Indian Economy

Create common national market for India, giving a boost to Foreign investment and “Make in India” campaign

Encouraging export and manufacturing activity and leading to substantive economic growth

Uniform SGST and IGST rates to reduce tax default rate.

### Impact of GST on Consumers

Simpler Tax system

Reduction in prices of goods & services due to elimination of repeated taxes

Uniform prices throughout the country

Transparency in taxation system

Increase in employment opportunities

### Impact of GST on Traders

Reduction in multiplicity of taxes

Reducing double taxation through input tax credit

More efficient neutralisation of taxes especially for exports

Development of common national market

Simpler tax rules

Fewer rates and exemptions

Distinction between Goods & Services no longer required

### What are the Different Types of GST?

In India, there are 4 components of GST. The following table explains the 4 types of GST

	<b>Central GST – CGST</b>	<b>State GST – SGST</b>	<b>Union territory GST – UTGST</b>	<b>Integr- ated GST - IGST</b>
<b>Tax Levied By</b>	Central Govern- ment	State Govern- ment	Union territory Govern- ment	Combined levy, collected by Central Govern- ment



### Let's Recall

The rates and types of GST are prescribed by Govt. Rates of GST are different for different products such as 0%,5%,12%,18%,28%. We have seen this in 10<sup>th</sup> standard.

GSTIN – Goods and Service Tax Identification Number.- dealers identification number.

HSN – Harmonized System of Nomenclature.  
- Goods are classified with HSN code

HSN code has been adopted by more than 200 countries. HSN code has been considered as a best logical tracking system for identification and classification of Goods. India has developed its own HSN code

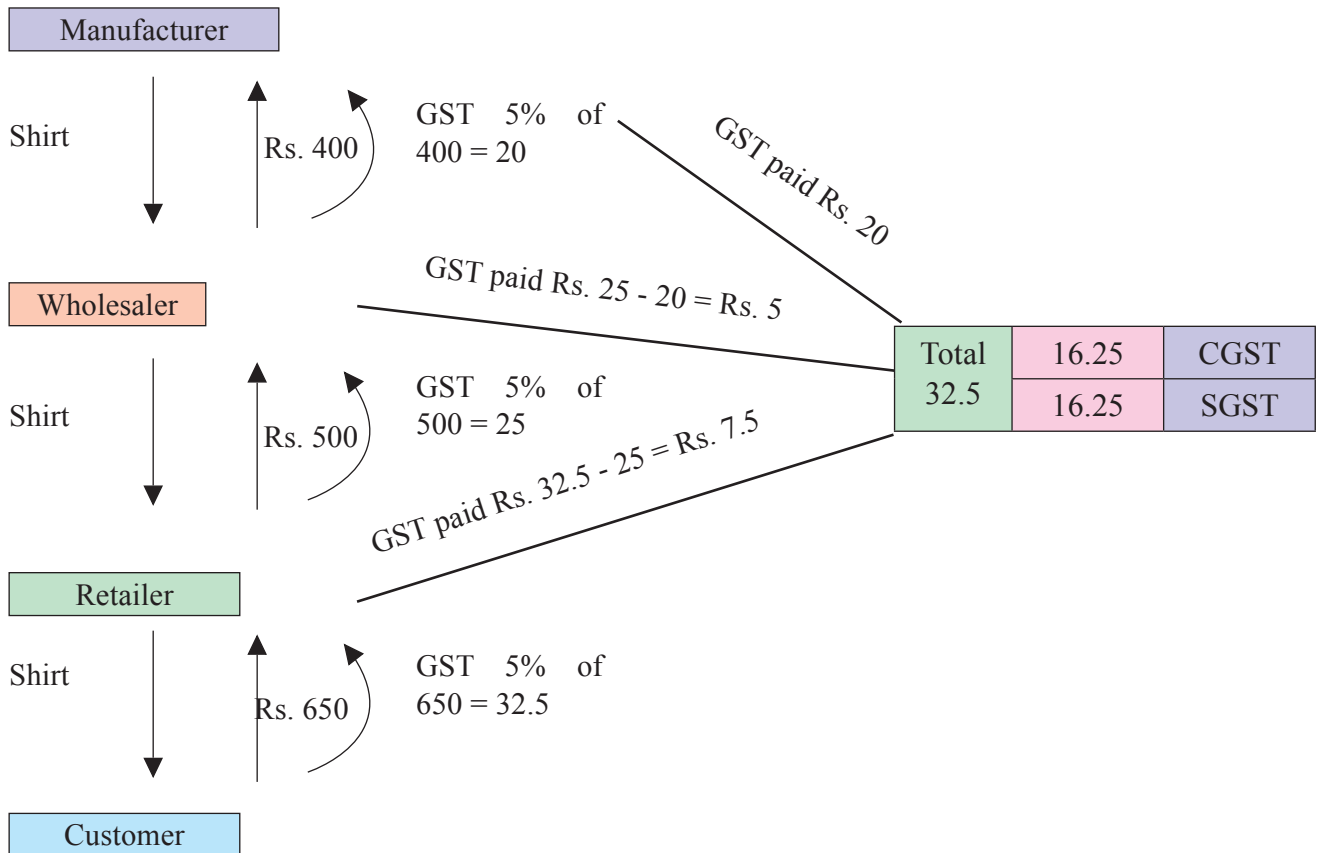
Is HSN code is compulsory for all the traders?  
HSN code is compulsory for all, except with a turnover less than 1.5 cr. in a financial year.

Other dealers have to follow the 3 HSN structure given below.

- 2 digit HSN code for an aggregate turnover above 1.5 cr. And less than 5 cr.
- 4 digit HSN code for aggregate turnover above 5 cr.
- 8 digit HSN code for importer and exporter.

SAC- Service Accounting Code – Services are classified with SAC code

ITC – Input Tax Credit- At the time of paying



GST to the government Input Tax is deducted from Output Tax. This deduction is called ITC. Output Tax – GST collected at the time of sale.

### Who is covered by GST?

All the businesses except agriculture and having aggregate turnover above Rs. 20 lakh in a financial year are liable to pay GST.

For NRI doing business in India, it is mandatory to register under GST irrespective of the turnover of his business.

### Who is exempted by GST?

Essential commodities like food grain, fruits, vegetables, milk, salt etc. and services like charitable trust activities, transport of water, agriculture related services, education and health care services etc.

### Example :

On garments costing less than Rs.1000. GST is applicable @ 5%

### What is Input Tax Credit (ITC)

When trader pays GST at the time of purchase, it is called 'Input tax' and he collects GST at the time of sale which is called 'Output tax'. At the time of paying GST to the government a trader deducts the 'Input Tax' from the Output tax and pays the remaining tax. This deduction of input tax is called input tax credit.

$$\text{GST Payable} = \text{Output Tax} - \text{ITC}$$

### Example: 2 (Comprehensive Comparison)

Comparison between Multiple Indirect tax and GST



Particulars (Rs.)	without GST	With GST	rate of 12.5%	1,185.80	–
Manufacture to Wholesaler			Add: CGST at the rate of 12%	–	1,016.40
Cost of Production	5,000.00	5,000.00	Add: SGST at the rate of 12%	–	1,016.40
Add: Profit Margin	2,000.00	2,000.00	Total Price to the Final consumer	10,672.20	10,502.80
Manufacturer Price	7,000.00	7,000.00	Cost saving to consumer	–	169.40
Add: Excise Duty at the rate of 12%	840.00	–	% Cost Saving	–	1.59
Total Value (a)	7,840.00	7,000.00			
Add: VAT at the rate of 12.5%	980.00	–			
Add: CGST at the rate of 12%	–	840.00			
Add: SGST at the rate of 12%	--	840.00			
Invoice Value	8,820.00	8,680.00			
Wholesaler to Retailer					
COG to Wholesaler (a)	7,840.00	7,000.00			
Add: Profit Margin at the rate of 10%	784.00	700.00			
Total Value (b)	8,624.00	7,700.00			
Add: VAT at the rate of 12.5%	1,078.00	–			
Add: CGST at the rate of 12%	–	924.00			
Add: SGST at the rate of 12%	–	924.00			
Invoice Value	9,702.00	9,548.00			
Retailer to Consumer:					
COG to Retailer (b)	8,624.00	7,700.00			
Add: Profit Margin at the rate of 10%	862.40	770.00			
Total Value(c)	9,486.40	8,470.00			
Add: VAT at the					

#### Let's Note:

The total price to the final customer is lesser under GST.

### SOLVED EXAMPLES

**Ex. 1 :** Shreyas caterer charged Rs.30,000 (for 100 people @ 300 each) for a family function. 5% GST is applicable to him. Find the amount of CGST & SGST & amounts payable by the customer.

#### Solution :

Bill Amount : Rs.30,000

Rate of GST = 5%

∴ Rate of CGST 2.5% and Rate of SGST 2.5%

$$\text{CGST \& SGST} = 30000 \times \frac{2.5}{100} = \text{Rs.750}$$

Amount payable by the customer

$$= 30000 + 750 + 750 = \text{Rs.31500}$$

**Ex. 2 :** “Darshana Auto Components” is selling Automobile spare parts. The firm purchased spare parts worth Rs.8,000 from wholesaler and sold it to customer for Rs.10,000. Rate of GST is 28%. Find

- Input Tax and Output Tax
- What amount of bill the company paid at the time of purchase
- Hence find the payable CGST and SGST

**Solution :**

- i) Input Tax = 28% of 8000  
 $= \frac{28}{100} \times 8000 = \text{Rs. } 2240$   
 Output Tax = 28% of 10000  
 $= \frac{28}{100} \times 10000 = \text{Rs. } 2800$
- ii) Total Bill Amount = 8000 + 2240  
 $= 10240$
- iii) GST Payable = Output Tax – Input Tax  
 $= 2800 - 2240$   
 $= \text{Rs. } 560$   
 CGST = SGST = Rs.280/-

**Ex. 3 :** Payal bought a Laptop with 15 % discount on printed price. The printed price of laptop was Rs. 60000. 18% of GST was charged on discounted price. Find the amount of CGST and SGST. What amount did Payal pay ?

**Solution :**

Discount = 15% of Rs.60000 = Rs. 9000

Tax payable value of Laptop

= Rs. 60000 – Rs. 9000 = Rs. 51000

Rate of GST = 18% ( given)

Rate of CGST = 9%

CGST = 9% of 51000 = Rs. 4590

SGST = Rs. 4590

Amount Paid = 51000 + 4590 + 4590 = 60180

**Ex. 4 :** Suppose a manufacturer sold a washing machine for a taxable of Rs.12,000 to the wholesaler. Wholesaler sold it to the retailer for Rs.15,000 (taxable value). Retailer sold it to the customer for Rs.20,000 (taxable value). Rate of GST is 28%. Find

GST Payable by Manufacturer, Wholesaler, Retailers

**Solution :** GST Payable by manufacturer

$$= 12000 \times \frac{28}{100} = \text{Rs. } 3360$$

$$\begin{aligned} \text{Output tax of wholesaler} &= 15000 \times \frac{28}{100} \\ &= \text{Rs. } 4200 \end{aligned}$$

GST Payable by wholesaler

= Output tax – Input Tax

= Rs. 4200 – Rs. 3360 = Rs. 840

$$\text{Output tax by retailer} = 20000 \times \frac{28}{100} = 5600$$

GST Payable by Retailer

= Output of retailer – Input by retailer

= Rs. 5600 – Rs. 4200 = 1400

Total GST = 3360 + 840 + 1400 = 5600

**EXERCISE 9.6**

- 1) M/s Janaseva sweet mart sold sweets of Rs.3,86,000. What CGST and SGST he will pay if the rate of GST is 5%?
- 2) Janhavi Gas Agency purchased some gas cylinders for Rs. 500000 and sold them to the customers for Rs. 590000. Find amount of GST payable and amount of ITC 5% GST is applicable.
- 3) A company dealing in mobile phones purchased mobile phones worth Rs.500000 and sold the same to customers at Rs.6,00,000. Find amount Of ITC and amount of GST if rate of GST is 12%.
- 4) Prepare Business to customers (B2C) tax invoice using given information. Write the name of supplier, address, state, Date, Invoice Number, GSTIN etc. as per your choice

Supplier : M/s .....

Address : .....

State : ..... Date : .....

Invoice No : ..... GSTIN : .....

Particular : Rate of Sarrees – Rs.2750 Rate of GST 5% HSN 5407–2 pcs

Rate of Kurta – Rs. 750 Rate of GST 12%  
HSN 5408

- 5) Heena Enterprise sold cosmetics worth Rs. 25000 to Leena traders, a retailer. Leena Traders sold it further to Meena Beauty Products for Rs. 30000. Meena Beauty Product sold it further to the customers for Rs. 40000. Rate of GST is 18%

Find i) GST Payable by each party

ii) CGST and SGST

- 6) 'Chitra furnishings' purchased tapestry (curtain cloth) for Rs. 2800000 and sold for Rs. 4480000 Rate of GST is 5%. Find,

i) Input Tax

ii) Output Tax

iii) ITC

iv) CGST and SGST

- 7) Two friends 'Aditi' and 'Vaishali' went to a restaurant. They ordered 2 Masala Dosa costing Rs. 90 each 2 coffee costing Rs. 60 each and 1 sandwich costing Rs. 80. If GST is charged at 5% Find Total amount of bill including GST.

## 9.7 Shares and Dividends



### Let's Recall

In 10<sup>th</sup> standard we have studied Shares, Dividend, Return on investment and Brokerage. Now we will revise these terms and practice some examples.

### Stock Capital:

The total amount of money needed to run the company is called the stock capital.

### Shares

The whole capital is divided into small units. Each unit or part is called a share. Company can

raise capital by issuing shares. An individual or an organization can buy shares and that individual or organization will be owner of the company to the extent proportional to the shares owned by him.

**Definition** - A unit of ownership that represents an equal proportion of a company's capital. It entitles its holder (the shareholder) to an equal claim on the company's profits and an equal obligation for the company's debts and losses.

### Two major types of shares are

- (1) ordinary shares (common stock), which entitle the shareholder to share in the earnings of the company as and when they occur, and to vote at the company's annual general meetings and other official meetings, and
- (2) Preference shares (preferred stock) which entitle the shareholder to a fixed periodic income (interest) but generally do not give him or her voting rights.

### Dividend:

The annual profit distributed among shareholders is called dividend.

Dividend is paid periodically as per share or as a percentage.

### Face Value:

The value of a share or stock printed on the share-certificate is called its Face Value or Nominal Value or Par Value.

### Market Value:

The value of a share or stock at which it is bought or sold readily in market place.

The stock of different companies are sold and bought in the open market through brokers at stock-exchanges. A share or stock is said to be:

At premium or above par, if its market value is more than its face value.

At par, if its market value is the same as its face value.

At discount or below par, if its market value is less than its face value.

Thus, if a Rs. 100 stock is quoted at premium of 16, then market value of the stock

$$= \text{Rs}100 + 16 = \text{Rs. } 116.$$

Likewise, if a Rs. 100 stock is quoted at a discount of 7, then market value of the stock

$$= \text{Rs. } (100 - 7) = 93.$$

### Brokerage:

The broker's charge is called brokerage.

- (i) When stock is purchased, brokerage is added to the cost price.
- (ii) When stock is sold, brokerage is subtracted from the selling price.



### Let's Remember

The face value of a share always remains the same.

The market value of a share changes from time to time. Dividend is always paid on the face value of a share.

### SOLVED EXAMPLES

**Ex.1.** Madhav buys shares of face value Rs.50 of a company which pays 10 % dividend. At what price did he buy each share from the market if his profit is 16 % on his investment?

**Solution:** Let the market value (M.V.) of each share be x.

The dividend is calculated on nominal value.

The dividend on one share = 10% of Rs. 50 = Rs. 5.

Therefore, he earned Rs. 5 on an investment of X

$$\text{A profit of } 16 \% \text{ on } X = \frac{16}{100} \times X = \frac{4X}{25}$$

$$\text{Therefore, } \frac{4X}{25} = \text{Rs.}5$$

$$X = \text{Rs.}25 \times \frac{5}{4}$$

$$X = \text{Rs.} \frac{125}{4}$$

$$X = \text{Rs. } 31.25$$

Therefore, Madhav bought each share at Rs. 31.25 from the market.

**Ex.2 :** Reeta bought 6% Rs. 100 shares at Rs.120. Aditi bought 8% Rs. 20 shares at Rs.30. Whose investment was better?

**Solution:** 6% Rs.100 shares at Rs.120

i.e., the annual income from 1 share of nominal value Rs. 100 is Rs. 6, investment for 1 share being Rs.120.

$$\text{Therefore, profit percentage} = \frac{6}{120} \times 100 = 5$$

Therefore, Reeta's shares give her a profit of 5%

8 % Rs.20 shares at Rs. 30

i.e., the annual income from 1 share of nominal

$$\text{value Rs. 20 is Rs. } 8 \times \frac{20}{100} = \text{Rs. } \frac{8}{5} = \text{Rs.}1.6$$

Investment for 1 share being Rs. 30.

Profit percentage

$$= \text{Rs.}(1.6 \div \text{Rs.}30) \times 100 = 5.33\%$$

Therefore, Aditi's shares give her a profit of 5.33% Therefore, Aditi's investment was better.

**Ex.3 :** Mohan invested Rs.67200 in Rs.100 shares which are quoted at Rs.120. Calculate the income if 12% dividend is declared on the shares.

**Solution:**

Total sum invested = Rs.67200 and market value (M.V.) of each share = Rs.120.

Therefore, number of shares bought

$$= \text{Rs.}67200 / 120 = 560$$

According to the problem, dividend on 1 share = 12% of face value.

$$= 12\% \text{ of Rs.}100$$

$$= \text{Rs.}12$$

Therefore, the total income from the shares

$$= 560 \times 12 = \text{Rs.}6720$$

**Ex.4 :** Mr. Pratik bought 50 shares, each of nominal value Rs.100. After one year he received Rs. 400 as dividend against them. Find the rate of dividend on his shares.

**Solution:**

$$\text{The dividend on one share} = \text{Rs. } \frac{400}{50} = \text{Rs } 8.$$

Therefore, the dividend was Rs. 8 on a share of face value Rs. 100.

Therefore, the rate of dividend

$$= \text{Rs. } \frac{8}{100} \times 100 \% = 8\%$$

**Ex.5 :** Calculate the dividend due at the end of a year on 250 shares of Rs. 50 each, if the half-yearly dividend is 4 % of the value of share.

**Solution:**

Given, half-yearly dividend on 1 share

$$= 4\% \text{ of } 50$$

Therefore, the yearly dividend on 1 share

$$= 8\% \text{ of Rs. } 50$$

$$= \frac{8}{100} \times 50$$

$$= \text{Rs. } 4$$

Total dividend due at the end of the year

$$= 250 \times 4 = \text{Rs. } 1000$$

**Ex. 6 :** A company declares semi-annual dividend of 6 %. Chitra has 500 shares of face value Rs. 25 each. Find Chitra's annual income.

**Solution:**

Total nominal value of shares

$$= \text{Rs. } 25 \times 500 = \text{Rs. } 12500$$

Therefore, semi-annual dividend

$$= 6 \% \text{ of Rs. } 12500$$

$$= \frac{6}{100} \times 12500$$

$$= \text{Rs. } 750.$$

Therefore, his annual income

$$= \text{Rs. } 750 \times 2 = \text{Rs. } 1500.$$

## EXERCISE 9.7

- Shantanu has a choice to invest in Rs.10 shares of two firms at Rs.13 or at Rs.16. If the first firm pays 5% dividend and the second firm pays 6% dividend per annum, find:
  - Which firm is paying better?
  - If Shantanu invests equally in both the firms and the difference between the return from them is Rs. 30. Find how much, in all, does he invest.
- A dividend of 9% was declared on Rs.100 shares selling at a certain price in the stock market. If the rate of return is 7.5%, calculate
  - The market price of each share, and
  - The amount to be invested to obtain an annual dividend of Rs. 630.
- Nilesh has the option of investing his money in 8% Rs. 10 shares at a premium of Rs.3.50 or 7% Rs. 100 shares at a premium of 20%. Which of the two investments will be more profitable for him?
- Sudhakar invests Rs. 1344 in buying shares of face value Rs.24 selling at 12% premium. The dividend on the shares is 15% per annum. Calculate
  - The number of shares Aditya buys, and
  - The dividend he receives annually.
- Sameer invests Rs. 5625 in a company paying 7% per annum when share of Rs. 10 stands for Rs.12.50. Find Sameer's income from this investment. If he sells 60 % of these shares for Rs.10 each, find his gain or loss in this transaction.
- Geeta buys Rs.100 shares of a company which pays 15 % dividend. She buys the shares at a price from the market that gives her 10% return on her investment. At what price did she buy each share?

7. Tejas invests in 9% Rs. 100 shares at Rs. 145 but Shail invests in 7% Rs. 100 shares at Rs.116. whose investment is better?
8. A 6% share yields 8%. Find the market value of a Rs 100 share.
9. Ashwini bought Rs. 40 shares at a premium of 40%. Find the income, if Ashwini invests Rs. 14000 in these shares and receives a dividend at the rate of 8% on the nominal value of the shares.
10. Mr. Rutvik Invests Rs. 30,000 in buying shares of a company which pays a 12 % dividend annually on Rs. 100 shares selling at a premium of Rs. 50. Find
  - (i) The number of shares bought by Mr. Rutvik, and
  - (ii) His annual income from the shares.
11. Rasika bought Rs. 40 shares at a discount of 40%. Find the income, if she invests Rs.12000 in these shares and receives a dividend at the rate of 11% on the nominal value of the shares.
12. Nisha invests Rs. 15840 in buying shares of nominal value Rs.24 selling at a premium of 10%. The company pays a 15% dividend annually. Find
  - (i) The dividend she receives annually, and
  - (ii) The rate of return from her investment.
13. Ashutosh buys 400, Rs. 100 shares at a discount of 20 % and receives a return of 12% on his money. Calculate:
  - (i) The amount invested by Ashutosh.
  - (ii) The rate of dividend paid by the company.
14. Vaishnavi bought 1000, Rs.100 shares from the stock market carrying 8% dividend quoted at Rs.130. A few days later the market value of the shares went up by 10%. Vaishnavi sold all her shares. What was her total income from this transaction?
15. Mr. Dinesh invests Rs. 20800 in 6% Rs. 100 shares at Rs. 104, and Rs. 14300 in 10.5% Rs. 100 shares at Rs.143. What will be his annual income from the shares?
16. A company declares a semi-annual dividend of 5%. Daniel has 400 shares of company. If Daniel's annual income from the shares is Rs. 1000, find the face value of each share.
17. Bhargav buys 400, twenty-dollar shares at a premium of Rs. 4 each and receives a dividend of 12%. Find:
  - (i) The amount invested by Bhargav
  - (ii) His total income from the shares.
  - (iii) Percentage return on his money.
18. Anil buys 350 Rs 100 shares of a company at a premium of 20% from the market. The company pays 12% dividend annually. Find
  - (i) the investment made by the Anil,
  - (ii) his annual income from the shares, and
  - (iii) the rate of return from the shares.



### Let's Remember

- Percentage increase  

$$= \frac{\text{Increase in Quantity}}{\text{Original Quantity}} \times 100$$
- Percentage decrease  

$$= \frac{\text{Decrease in Quantity}}{\text{Original Quantity}} \times 100$$
- To increase a number by  $x$  % multiply it by  $\frac{100 + x}{100}$
- To decrease a number by  $x$  % multiply it by  $\frac{100 - x}{100}$



- If A's income is  $r$  % more than B's income then B's income is less than A's income by

$$\frac{r}{100+r} \times 100 \%$$

- If A's income is  $r$  % less than B's income then B's income is more than A's income by

$$\frac{r}{100-r} \times 100 \%$$

- If price of a commodity increases by  $x$  % then to keep the expenses same the consumption

$$\text{must be reduced by } \frac{x}{100+x} \times 100 \%$$

- If price of a commodity decreases by  $x$  % and expenses are same, the consumption

$$\text{can be increased by } \frac{x}{100-x} \times 100 \%$$

- Gain = (S.P.) – (C.P.)

- Loss = (C.P.) – (S.P.)

- Gain Percentage : (Gain %)

$$\text{Gain \%} = \frac{\text{Gain} \times 100}{\text{C.P.}}$$

- Loss Percentage : (Loss %)

$$\text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}}$$

- Selling Price (S.P.) when there is Gain.

$$\frac{100 + \text{gain}\%}{100} \times \text{C. P.}$$

- Selling Price (S.P.) when there is Loss.

$$\frac{100 - \text{Loss}\%}{100} \times \text{C. P.}$$

- Cost Price (C.P.) when there is Gain.

$$\text{C.P.} = \frac{100}{100 + \text{gain}\%} \times \text{S. P.}$$

- Cost Price (C.P.) when there is Loss.

$$\text{C.P.} = \frac{100}{100 - \text{loss}\%} \times \text{S. P.}$$

- When a person sells two similar items, one at a gain of  $x$ %, and the other at a loss of  $x$ %, then the seller always incurs a loss given by :

$$\text{Loss\%} = \left( \frac{\text{common loss and gain}\%}{10} \right)^2 = \left( \frac{x}{10} \right)^2$$

- Sometimes a seller claims to sell goods at cost price. But he uses a false weight. Then he earns profit.

$$\text{To find profit percent} = \frac{\text{Error}}{\text{True value} - \text{Error}} \times 100$$

- Simple interest :  $I = \frac{Pn.r.}{100}$  and

$$A = P + \frac{Pn.r.}{100}$$

- Compound interest :  $A = P \left( 1 + \frac{r}{100} \right)^n$

- **Dividend :-** The annual profit distributed among shareholders is called dividend. Dividend is paid annually as per share or as a percentage.

- **Face Value :-** The value of a share or stock printed on the share - certificate is called its Face Value or Nominal Value or Par Value.

- **Market Value :-** The value of a share or stock at which it is bought or sold readily in market place.

- **Brokerage :-** The broker's charge is called brokerage.

### MISCELLANEOUS EXERCISE - 9

- 1) A man buys a house for Rs 10 lakh and rent it. He puts 10% of the annual rent aside for repairs, Pays Rs. 1000 as annual taxes and realizes 8% on his investment thereafter . Find the annual rent of the house.

- 2) Rose got 30% of the maximum marks in an examination and failed by 10 marks. However, Lily who appeared for the same examination got 40% of the total marks and got 15 marks more than the passing marks. What were the passing marks in the examination ?
- 3) Ankita's Salary was reduced by 50%. Again the reduced salary was increased by 50%. Find loss in terms of percentage.
- 4) By selling 300 lunch boxes, a shopkeeper gains the selling price of 100 lunch boxes. Find his gain percentage.
- 5) A salesman sold an article at a loss of 10%. If the selling price has been increased by Rs. 80, there would have been a gain of 10%. What was cost of the article ?
- 6) Find the single discount equivalent to a series discount of 10%, 20% and 15%.
- 7) Reshma put an amount at simple interest at a certain rate for 3 years. Had she been put at 2% higher rate, she would have received Rs 360 more. Find the sum.
- 8) The compound interest on Rs. 30000 at 7% p.a. is Rs. 4347. What is the period in years.
- 9) The value of the machine depreciates at the rate of 15% p.a. It was purchased 2 years ago. Its present value is Rs. 7225. What was the purchase price of the machine ?
- 10) A tree increases annually by  $\frac{1}{8}$  of its height. By how much will it increase after  $2\frac{1}{2}$  years. If its length today is 8 m. ?
- 11) A building worth Rs. 121000 is constructed on land worth Rs. 81000. After how many years will the value of both be the same if land appreciates at 10% pa. and buildings depreciates at 10% p.a.
- 12) Varun invested 25%, 30% and 20% of his savings in buying share of three different companies. 'A', 'B' and 'C' which declared dividends. 10%, 12% and 15% respectively. If his total income on account of dividends is Rs. 6370/-, find the amount he invested in buying shares of company 'B'.
- 13) Find the annual dividend received from Rs. 25000, 8% stock at 108.
- 14) A, B and C enter into partnership . A invests 3 times as much as B invests and B invests two third of what 'C' invests. At the end of the year, the profit earned is Rs. 8800. What is share of 'B' ?
- 15) The ratio of investment of two partners Santa and Banta is 11 : 12 and the ratio of their profits is 2 : 3. If Santa invested the money for 8 months, then for how long Banta invested his money ?
- 16) Akash, Sameer and Sid took a house on rent for once year for Rs.16236. They stayed together for 4 months and then sid left the house. After 5 more months. Sameer also left the house. How much rent should each pay ?
- 17) Ashwin Auto Automobiles sold 10 motorcycles. Total sales amount was Rs. 680000. 18% GST is applicable. Calculate how much CGST and SGST the firm has to pay.
- 18) 'Sweet 16' A ready made garments shop for Womens garments, purchased stock for Rs. 400000 and sold that stock for 550000 ( 12% GST is applicable) Find,
  - i) Input Tax Credit
  - ii) CGST and SGST paid by the firm.

### Activity 9.1

Find face value and market value of following companies.

Sr. No.	Stocks	Face Value	Market Value
1	ONGC		
2	TCS		
3	SBI		
4	HDFC Bank		
5	Reliance		

### Activity 9.2

Let price of P.A.B. motors Stock is Rs. 180

Find Brokerage @ 0.50% =

GST @ 0.01% =

Other charges @ 0.09 % =

Total cost to buy one share of P.A.B. motors =

