

*Learning Objectives*

*In this chapter, you will learn*

- *About concept of ratio and percentage.*
- *About concept of marked price. (M.P.) and discount, their percentage and their application in daily life.*
- *About sale tax and its application in daily life.*
- *About simple and compound interest and their application in our daily life.*
- *About bank passbook and how to fill deposit and withdrawal slip.*

**7.1 Recalling Ratios and Percentage :-**

In Class VII we have already studied about concept of ratio and proportion. We know, the meaning of ratio is to compare two quantities. Let us take a basket having two types of fruits say, apples and bananas (fig.). Let number of apples be 40 and number of bananas be 10, then the ratio of number of apples to the number of bananas is 40 : 10.

We can also do the comparison by using fractions as  $\frac{40}{10} = \frac{4}{1}$ .

From this we can say that in the basket, the number of apples are four times the number of bananas. Similarly the ratio of number of bananas to the number of apples is 10 : 40.

In fraction form, we can write it as  $\frac{10}{40} = \frac{1}{4}$  i.e. 1:4 So We can say that in the basket the number of bananas are  $\frac{1}{4}$  th the number of apples.

We read it as 1 is to 4.

The comparison can also be done by using **Percentage**. There are two different methods to find the percentage.



There are 40 apples out of 50 fruits in the basket. So out of total fruits, Ratio of apples

in the basket is  $\frac{40}{50}$ , to find the percentage we have to make the denominator 100

$$\text{So } \frac{40}{50} = \frac{40}{50} \times \frac{2}{2} = \frac{80}{100}$$

Hence we can say that in the basket out of total number of fruits, 80% are apples.

Or

we can also find it with the help of Unitary method.

Out of 50 fruits in the basket the number of apples are 40.

So out of 100 fruits in basket the

$$\begin{aligned} \text{number of apples} &= \frac{40}{50} \times 100 \\ &= 80. \end{aligned}$$

As basket contains only two fruits apples and bananas, so Percentage of apples + Percentage of bananas = 100

$$\text{i.e. } 80 + \text{Percentage of bananas} = 100$$

$$\text{So, Percentage of bananas} = 100 - 80 = 20$$

So basket has 80% apples and 20% bananas.

**Aliter :** We can also find it as out of total 50 fruits in the basket, the number of bananas are 10, so out of 100 fruits, the number of bananas are  $= \frac{10}{50} \times 100 = 20$ . Hence in basket, bananas are 20%.

We often ask a student that how much percent of marks he/she got in his/her previous exam.

To further clear the concept, study the following examples :

**Example 7.1 : Find the ratio of the following:**

(i) Speed of cycle 20km/hour to speed of car 60 km/hour

(ii) 5 m to 20 m

(iii) 50 paise to ₹ 5

**Sol.** (i) Speed of cycle = 20km/h

Speed of car = 60km/h

Speed of cycle to the speed of car is 20 : 60.

In fraction, we can write it as  $\frac{20}{60} = \frac{1}{3}$  i.e. 1:3

So, we can say that speed of cycle per hour is  $\frac{1}{3}$ rd the speed of car per hour.

(ii) 5 m to 20 m is 5 : 20.

In fraction form it is  $\frac{5}{20} = \frac{1}{4}$  i.e. 1 : 4. We read it as 1 is to 4.

(iii) 50 paise to ₹ 5

50 paise to 500 paise.

= 50 : 500

(As ₹1 = 100 Paise, So, ₹ 5 = 500 Paise)

In fraction form it is  $\frac{50}{500} = \frac{1}{10}$  i.e. 1 : 10

We read it as 1 is to 10.

**Example 7.2:** Convert the following ratios into percentage :

(i) 1 : 4

(ii) 3 : 4

(iii) 2 : 5

**Sol.** (i)  $1 : 4 = \frac{1}{4} = \frac{1}{4} \times \frac{25}{25} = \frac{25}{100}$  i.e. 25%

(To find percentage, make the denominator 100)

(ii)  $3 : 4 = \frac{3}{4} = \frac{3}{4} \times \frac{25}{25} = \frac{75}{100}$  i.e. 75%

(iii)  $2 : 5 = \frac{2}{5} = \frac{2}{5} \times \frac{20}{20} = \frac{40}{100}$  i.e. 40%

**Example 7.3 :** In a class, out of total students, 40% are boys. If boys are 12 in number then find (i) Total students in the class (ii) number of girls in the class (iii) Ratio of girls to boys of the class.

**Sol.** Let total number of students be  $x$

So, as per question, 40% of  $x = 12$

$$\Rightarrow x \times \frac{40}{100} = 12$$

$$\text{So, } x = \frac{12 \times 100}{40} = 30$$

(i) So total number of students in the class are 30.

(ii) Number of girls = 30 – Number of boys = 30 – 12 = 18

(iii) Ratio of girls to boys =  $18 : 12 = \frac{18}{12} = \frac{3}{2}$

We can write it as 3 : 2 and read as 3 is to 2.

**Aliter :** As we know that percent means out of 100. So 40% boys means, there are 40

boys out of 100 students. As boys are 12, so the total number of students are  $= \frac{100}{40} \times 12 = 30$ .

From the total number of students, we can find number of girls and the ratio of girls and boys as we have done above.

**Example 7.4 :** A school organised a picnic for a class having 38 students. The picnic spot is 60 km away from the school. The transport company is charging at the rate of ₹ 8 per km. If two teachers are also going with the class and cost of refreshment is ₹3840. Find (i) Cost per head (ii) If their first stop is 18 km from the school, then up to first stop, what percent of total trip they have covered and what percent is left behind ?



**Sol.** (i) To find the cost per head, first, we have to find the total cost of trip.

$$\begin{aligned}\therefore \text{Total cost of trip} &= \text{Transport Charges} + \text{Refreshment Cost} \\ &= (60 \times 2) \times 8 + 3840 \\ &= 960 + 3840 = ₹ 4800\end{aligned}$$

$$\begin{aligned}\text{Total Persons} &= \text{Total Students} + \text{Teachers} \\ &= 38 + 2 = 40\end{aligned}$$

$$\text{So Cost per head} = 4800 \div 40 = ₹120$$

(ii) Their first stop is at 18 km from school.

$$\text{So percentage of distance covered out of total distance is} = \frac{18}{120} \times 100 = 15\%$$

$$\text{and percentage of distance left} = 100 - 15 = 85\%$$

For remaining distance, we can also find it as

$$\text{Remaining distance} = 120 - 18 = 102\text{km}$$

$$\text{So percentage} = \frac{102}{120} \times 100 = 85\%$$

## *Exercise* **7.1**

1. Find the ratio :

(i) Speed of cycle 12 km/hr to the speed of car 36 km/hr.

(ii) 10 m to 10 km

(iii) 1.5 m to 10 cm

(iv) 1 hr to 300 seconds

(v) 80 paise to ₹4

(vi) 200g to 8kg

2. Out of 20 students in a class, 50% of students are good in science. Find the number of students good in science.

3. 35% of 40 students are good in statistics. How many students are not good in statistics?

4. What percent of numbers from 1 to 50 are prime?

5. Convert the following ratios to percentage :

(i) 1 : 3

(ii) 4 : 5

(iii) 1 : 2

(iv) 2 : 5

(v) 5 : 4

(vi) 1 : 5

6. A man spent 87% of his salary. If he saved ₹325, find his salary.

7. A Kabbadi team played 15 matches and won 60% of the matches. How many matches did they lose?

8. From a class of 60 students, 40% students like chess, 15% like carrom and remaining students like other games. Find number of students who like carrom, chess and other games.

9. **Multiple Choice Questions :**

(i) The ratio of 6 km to 600 m is

(a) 1:100

(b) 10:1

(c) 1:10

(d) 100:1

(ii) Percentage of 3:4 is

(a) 75%

(b) 50%

(c) 25%

(d) 100%

(iii) Ratio of 200 paise to ₹3 is

(a) 2 : 3

(b) 3 : 2

(c) 200 : 3

(d) 3 : 200



- (iv) There are 48 girls out of 80 students. Percentage of girls is  
 (a) 50% (b) 80% (c) 75% (d) 60%
- (v) Conversion of 3:5 into percentage is  
 (a) 30% (b) 50% (c) 60% (d) 80%

## 7.2 Finding Discount :-

To attract customers or to promote the sale of goods, the companies often give discount. The discount is reduction given on the **Marked Price (M.P.)**. Marked Price is also known as List Price and  $\text{Discount} = \text{Marked Price (M.P.)} - \text{Selling Price (S.P.)}$

$$\text{Discount \%} = \frac{\text{Discount}}{\text{Marked Price}} \times 100$$

**Example 7.5 :** A shop gives 20% discount on the Marked Price. What would be selling price of each of the following :

- (i) A dress marked at ₹ 300 (ii) A pair of shoes marked at ₹ 750

**Sol.** (i) Marked Price of dress = ₹ 300

$$\begin{aligned}\text{Discount} &= 20\% \text{ of ₹ } 300 = \left( 300 \times \frac{20}{100} \right) \\ &= ₹ 60\end{aligned}$$

$$\begin{aligned}\text{So Selling price of dress} &= \text{Marked Price} - \text{Discount} \\ &= ₹ 300 - ₹ 60 = ₹ 240\end{aligned}$$

- (ii) Marked Price of pair of Shoes = ₹ 750

$$\begin{aligned}\text{Discount} &= 20\% \text{ of ₹ } 750 = ₹ \left( 750 \times \frac{20}{100} \right) \\ &= ₹ 150\end{aligned}$$

$$\begin{aligned}\text{So Selling price of pair of shoes} &= \text{Marked Price} - \text{Discount} \\ &= ₹ 750 - ₹ 150 \\ &= ₹ 600\end{aligned}$$

**Example 7.6 :** A Photoframe is marked at ₹ 600 is sold for ₹ 450. What is the discount and discount percentage ?

**Sol.** We know,  $\text{Discount} = \text{Marked Price (M.P.)} - \text{Selling Price (S.P.)}$

$$\begin{aligned}\text{So Discount} &= ₹(600 - 450) \\ &= ₹ 150\end{aligned}$$

$$\text{Discount \%} = \frac{\text{Discount}}{\text{Marked Price}} \times 100 \quad (\text{As Discount is always on Marked Price.})$$

$$\text{Now Discount \%} = \frac{150}{600} \times 100$$

$$\therefore \text{Discount percentage} = 25\%$$

## Exercise 7.2

1. An article marked at ₹1920 is sold for ₹1840, what is discount and discount percentage?
2. A book marked at ₹791 is sold for 678 ₹. Find discount and discount percent.
3. The list price (M.P.) of bag is ₹220. A discount of 15% is announced on sale. What is its sale price ?
4. The marked price of a ceiling fan is ₹720. During off season it is sold for ₹684. Determine the discount percentage.
5. A shop offers 4% discount on all cash purchases. What cash amount do we need to pay for an item whose marked price is ₹650 ?
6. A saree is sold for ₹720 after giving a 20% discount on Marked Price. What is the Marked Price ?
7. If Ankush is getting discount of 8% on an item with marked price of ₹400. Find the discount and cost price of item for ankush.
8. Rachna is getting discount of 10%, 15% and 20% on 3 books each with marked price ₹100. Find total amount Rachna has to pay.
9. **Multiple Choice Questions :**
  - (i) Discount is calculated on:  
(a) S.P. (b) M.P. (c) C.P. (d) None of these
  - (ii) Discount percent is equal to:  
(a)  $\frac{\text{Discount}}{\text{M.P.}} \times 100$  (b)  $\frac{\text{Discount}}{\text{S.P.}} \times 100$   
(c) S.P. - M.P. (d) M.P. - C.P.
  - (iii) A table marked at ₹15000 is available for ₹14400. The discount percent is:  
(a) 2% (b) 4% (c) 5% (d) 7%
  - (iv) A book marked at ₹900 is sold for ₹873. The discount is  
(a) 72 (b) 27 (c) 29 (d) 24
  - (v) A Chair is sold at 4% discount and marked price of chair is ₹450. What is selling price of chair?  
(a) ₹ 412 (b) ₹ 425 (c) ₹ 432 (d) ₹ 440

### 7.2.1 Estimation in Percentage

Suppose your total purchase is of ₹1157.80 and you are offered a discount of 30% on total bill value. Then how will you estimate the final amount to be paid ?

Step I : Round off the bill of 1157.80 to nearest tens i.e. ₹ 1160.

Step II: Find 30% of 1160.

$$= 1160 \times \frac{30}{100} = 348$$

When estimated to nearest tens will be ₹350.

Amount to be paid = 1160 - 350 = ₹810

**Example 7.7 :** Estimate the bill amount to be paid, if

(i) bill is ₹669.70 and discount is 10%

(ii) bill is ₹1008, discount 10%

**Sol.** (i) Round the bill to nearest tens, here bill is ₹669.70, so its nearest tens is ₹670.

Discount = 10% of 670

$$= 670 \times \frac{10}{100} = 67, \text{ Its nearest tens is ₹70}$$

So estimated bill amount to pay = ₹670 – ₹70 = ₹600

(ii) Bill amount is ₹1008, its nearest tens is ₹1010.

Discount = 10% of 1010

$$= 1010 \times \frac{10}{100}$$

$$= 101, \text{ Its nearest tens is ₹100.}$$

So Estimated bill amount to pay is ₹1010 – ₹100 = ₹910.

## *Exercise* 7.3

1. Let your bill in a shop is ₹598.80 and the shopkeeper gives a discount of 20%. Estimate your bill amount.
2. Estimate the bill amount, if bill is ₹378 and shopkeeper gives a discount of 15%.

### 7.3 Sales Tax

For the development of a country, Government requires money. Government collect this money by implementing various types of taxes.

The sale tax is charged by the Government on the sale of an item. It is collected by the shopkeeper from the customer and given to the government. Therefore, it is always on the selling price of an item and is added to the value of the bill. Now a days Goods and Services Tax (GST) is being levied on supply of goods and services.

**Example 7.8 :** Find the buying price of each of the following when 5% sales tax is added to the purchase of

(i) A towel at ₹120

(ii) Pair of roller skates at ₹450

**Sol.** (i) Price of Towel = ₹120

Sales tax = 5%

On ₹ 100 the sales tax = ₹5

$$\text{On ₹ 1 the sales tax} = ₹ \frac{5}{100}$$



$$\text{On ₹120 the sales tax} = ₹\left(\frac{5}{100} \times 120\right) = ₹6$$

$$\begin{aligned}\text{So Bill amount (Selling Price)} &= \text{Cost of Item} + \text{Sales tax} \\ &= ₹120 + ₹6 = ₹126\end{aligned}$$

(ii) Price of Pair of Roller Skates = ₹450

$$\text{Sales tax} = 5\%$$

$$\text{On ₹100 the sales tax} = ₹5$$

$$\text{So on ₹450 the sales tax} = ₹\left(\frac{5}{100} \times 450\right) = ₹22.50$$

$$\begin{aligned}\text{So bill amount (Selling amount)} &= \text{Cost of item} + \text{Sale Tax} \\ &= ₹450 + ₹22.50 \\ &= ₹472.50\end{aligned}$$

**Example 7.9 :** A person purchased a LED TV for ₹5400 including 8% sales tax. Find the price before sales tax was added.

**Sol.** The price of LED TV included the 8% sales tax is ₹5400. It means if the price without sales tax is ₹100 then price including sales tax is ₹108.

So, when price including sales tax is ₹108, then original price = ₹100

$$\begin{aligned}\text{Hence when price including Sales Tax is ₹5400, then original price} &= ₹\left(\frac{100}{108} \times 5400\right) \\ &= ₹5000\end{aligned}$$

## Exercise 7.4

1. The cost of a TV set at a showroom is ₹36500. The sales tax is 8%. Find the bill amount.
2. A LED TV is available for ₹26880 including sales tax. If the original cost of LED TV is ₹24000. Find the rate of sales tax.
3. The sales tax rate is 8%. If Rahul bought a washing machine and paid a sales tax of ₹1920. What is the cost of washing machine before sales tax ?
4. Seema bought a box of biscuits for ₹904 which includes a sale tax of 13%. What is the price of biscuit box without sale tax ?
5. The cost of pair of shoes at a shop is ₹440. The sales tax is 5%. Find bill amount.
6. **Multiple Choice Questions :**

- (i) Sales Tax on an item at 5% with marked price of ₹200.  
 (a) ₹5 (b) ₹10 (c) ₹15 (d) ₹20
- (ii) If sales tax of 15% is levied on shoes marked at ₹2000, find the final price after adding sales tax.  
 (a) ₹2500 (b) ₹2015 (c) ₹2300 (d) ₹2500
- (iii) A book after adding sales tax at 10% is sold for ₹165. What was its price before adding sales tax.  
 (a) ₹100 (b) ₹150 (c) ₹160 (d) ₹140
- (iv) A Cricket bat with list price of ₹5000 is sold after adding sales tax of 8%. Find selling price of bat.  
 (a) ₹5200 (b) ₹5600 (c) ₹6000 (d) ₹5400

## 7.4 Simple Interest

Interest is the extra money paid by banks or post offices etc. on money deposited with them. If people borrow money then also they have to pay interest. In class 7, you have already learnt how to calculate simple interest. In this section, we will discuss about compound interest.

During your bank visit, you might have come across the statements like “one year interest for FD (Fixed Deposit) in the bank @ 8% per annum or saving account with interest @ 4% per annum. Let's first revise concept of simple interest with following examples.

**Example 7.10 :** A sum of ₹5,000 is borrowed at a rate of 8% per annum for 2 years. Find the simple interest and the amount to be paid at the end of 2 years.

**Sol.** You know how to find the simple interest, we have the formula

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

Here, P = ₹5000, R = 8% per annum and T = 2 years.

where P means Principal (sum borrowed), R means Rate percent per year, T means time

$$\text{So S.I.} = ₹ \left( \frac{5000 \times 8 \times 2}{100} \right) = ₹800$$

Amount to be paid at the end of two years = Principal + S.I. = ₹5000 + ₹800

∴ Amount = ₹5800

**Aliter** We can also find interest using Unitary Method, as under.

On ₹100, interest charged for one year = ₹8

$$\text{So on ₹5,000 interest charged for one year} = ₹ \left( \frac{8}{100} \times 5000 \right) = ₹400$$

Interest for two years = ₹400 × 2 = ₹800

So amount to be paid at the end of two years  
 = Principal + Interest  
 = ₹5000 + ₹800 = ₹5800

## *Exercise* 7.5

1. In what time ₹1600 will amount to ₹1760 at rate 5% per annum simple interest.
2. At what rate of simple interest will a sum double itself in two years.
3. Find simple interest and amount to be paid on ₹15000 at 5% per annum after two years.

### 7.5 Calculating Compound Interest

Normally the interest paid or charged is never simple. The interest is calculated on the amount of previous year. This is known as interest compound or compound interest. If we have some money in our bank account, every year some interest is added to it, which is shown in the pass book. This interest is not the same, each year it increases (if we don't withdraw any amount from our account.)

Note that Principal remains same under simple interest while it changes year after year under compound interest. In compound interest, amount at the end of first year becomes the principal for second year, if it's compounded annually.

Let us take an example and find the interest year by year. Each year our principal changes.

**Example 7.11 :** A sum of ₹5000 was borrowed by Sham for 2 years at an interest of 4% compounded annually. Find the compound interest (C.I.) and the amount Sham has to pay at the end of 2 years.

**Sol.** Let us find simple interest for first year.

Here  $P = ₹5000$ ,  $R = 4\%$  p.a.,  $T = 1$  year

So simple interest after one year = ₹  $\left( \frac{5000 \times 4 \times 1}{100} \right) = ₹200$

At the end of first year

Amount = Principal + Interest = ₹5000 + ₹200 = ₹5200

In compound interest, the amount at the end of first year becomes the principal for second year.

Now interest for second year = ₹  $\left( \frac{5200 \times 4 \times 1}{100} \right) = ₹208$

Now amount which has to be paid at the end of second year

= ₹5200 + ₹208

= ₹5408

Compound Interest = Amount – Principal

= ₹5408 – ₹5000 = ₹408

Study the table given below, to find the difference between Simple and Compound Interest.



We start with Principal ₹200 and Rate 20%.

		Under S.I.	Under C.I.
First year	Principal	₹200.00	₹200.00
	Rate 20% p.a.	₹40.00	₹40.00
	Year end amount	₹240.00	₹240.00
Second year	Principal	₹200.00	₹240.00
	Rate 20% p.a.	₹40.00	₹48.00
	Year end amount	₹240.00 + ₹40.00 = ₹280.00	₹288.00
Third year	Principal	₹200.00	₹288.00
	Rate 20% p.a.	₹40.00	₹57.60
	Year end amount	₹280 + ₹40.00 = ₹320	₹345.60

**Table 7.1**

Note that in 3 years

Interest earned as simple interest = ₹320 – ₹200 = ₹120

whereas, Interest earned as Compound Interest = ₹345.60 – ₹200 = ₹145.60

Note that the principal remains same under simple interest, whereas it changes year after year under compound interest. At the end of year, first year amount becomes the second year principal and so on.

## 7.6 Deducing a formula for Compound Interest

Under this section, we shall deduce a formula to find compound interest. You know already a formula to find simple interest.

Suppose  $P_1$  is the principal on which interest is compounded annually at a rate of  $R\%$  per annum. After one year we have to find amount, we will denote the amount as  $A_1$ , which will become the principal for second year, that will be denoted as  $P_2$  and so on.

$$SI_1 = ₹ \frac{P_1 \times R \times 1}{100} \quad (\text{Here } SI_1 \text{ means S.I. for first year})$$

$$A_1 = P_1 + SI_1 = ₹ \left( P_1 + \frac{P_1 R}{100} \right) = ₹ P_1 \left( 1 + \frac{R}{100} \right) = P_2 \quad \dots (1)$$

(As amount at the end of first year will be Principal for second year)

$$\text{Now } SI_2 = \frac{P_2 \times R \times 1}{100} = P_1 \left( 1 + \frac{R}{100} \right) \times \frac{R}{100} \quad [\because P_2 = P_1 \left( 1 + \frac{R}{100} \right) \text{ from (1)}]$$

$$= \frac{P_1 R}{100} \left( 1 + \frac{R}{100} \right) \quad \dots(2)$$

$$\text{Now } A_2 = P_2 + SI_2$$

$$= P_1 \left( 1 + \frac{R}{100} \right) + P_1 \frac{R}{100} \left( 1 + \frac{R}{100} \right) \quad [\text{Using (1) \& (2)}]$$

$$= P_1 \left( 1 + \frac{R}{100} \right) \left( 1 + \frac{R}{100} \right) = P_1 \left( 1 + \frac{R}{100} \right)^2 = P_3$$

Proceeding in this way, the amount at the end of T years will be

$$A_T = P_1 \left( 1 + \frac{R}{100} \right)^T$$

$$\text{or We can say } A = P \left( 1 + \frac{R}{100} \right)^T$$

Where A is amount, P is principal, R is rate of interest and T is time.

From this, we can find compound interest as C.I. = A – P

**Example 7.12 :** Find the compound interest for 2 years at 5% per annum compounded annually where principal is ₹10,500.

**Sol.** For compound interest we will calculate Amount first of all by using formula,

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

where A = Amount, P = Principal, R = rate, T = time

we have, P = ₹10,500, R = 5% p.a., T = 2 years

$$\text{So } A = ₹10,500 \left( 1 + \frac{5}{100} \right)^2 = ₹10500 \times \left( \frac{21}{20} \right)^2$$

$$= ₹10500 \times \frac{21}{20} \times \frac{21}{20} = ₹11576.25$$

$$\text{C.I.} = A - P$$

$$= ₹11576.25 - ₹10,500.00$$

$$= ₹1076.25$$

## *Exercise* 7.6

1. Find compound interest on Rs 14,000 for 2 years at 10% per annum compounded annually.
2. Find compound interest on Rs 1000 for 3 years at 20% per annum compounded annually.
3. Multiple choice Question :

$$(i) \quad S.I = \frac{P \times \dots \times \dots}{100}$$

- (a) R, S                      (b) R, T                      (c) A, T                      (d) A, R
- (ii) S.I. on ₹2000 for 1 year at 10% p.a. is  
 (a) ₹2000                      (b) ₹200                      (c) ₹20                      (d) ₹2
- (iii) Compound interest = Amount – .....  
 (a) S.I.                      (b) Profit                      (c) Rate of interest                      (d) Principal
- (iv) Formula for calculating amount when compounded annually is  
 (a)  $P \left(1 + \frac{T}{100}\right)^R$                       (b)  $R \left(1 + \frac{P}{100}\right)^T$                       (c)  $P \left(1 + \frac{R}{100}\right)^T$                       (d)  $R \left(1 + \frac{T}{100}\right)^P$
- (v) In case of simple and compound interest for a period more than one year.  
 (a) S.I. < C.I.                      (b) C.I. > S.I.                      (c) S.I. = C.I.                      (d) None of these

### 7.7 Applications of Compound Interest Formula

There are some situations where we could use the formula for calculation of amount in compound interest.

- Growth and depreciation of value of an article.
- Increase or decrease in population.
- The growth of bacteria if rate of growth is known.

**Example 7.13.** The population of a town is 15,000. If it increases at the rate of 4% per annum, then what will be the population after two years ?

**Sol.** As population increases at the rate of 4% per year, so every new year has new population. Thus we can say it is increasing in compounded form.

$$\begin{aligned}
 \text{So Population after two years} &= 15000 \left(1 + \frac{4}{100}\right)^2 \\
 &= 15000 \left(1 + \frac{1}{25}\right)^2 \\
 &= 15000 \left(\frac{26}{25}\right)^2 \\
 &= 15000 \times \frac{26}{25} \times \frac{26}{25} = 16224
 \end{aligned}$$

**Example 7.14.** A second hand scooter was bought at a price of ₹24000. Its rate was depreciated by 5% per year. Find the value of scooter after two years. (Depreciation means reduction of value due to use and age of item.)

**Sol.** Here Price of Scooter (P) = ₹24000

Time = 2 years

Rate of depreciation = 5% per year

As rate is depreciating every year by 5%, So we can use amount formula of compound interest. But note it as value is decreasing so rate will be -5%.



$$\text{So Value of Scooter after two years} = ₹24000 \left(1 - \frac{5}{100}\right)^2$$

$$[\text{Note : } A = P \left(1 + \frac{r}{100}\right)^t, \text{ Here } r = -5]$$

$$= ₹24000 \left(1 - \frac{5}{100}\right)^2 = ₹24000 \left(\frac{19}{20}\right)^2$$

$$= ₹24000 \times \frac{19}{20} \times \frac{19}{20} = ₹21660$$

## *Exercise* 7.7

1. The value of a machine depreciates at the rate of 10% per annum. If its present value is ₹10,00,000. What will be its value after two years ? Also find the depreciation.
2. The cost of a plot is ₹6,40,000. It increases at a rate of 5% of its previous value after every year. What will be its value after two years ?
3. A person purchased a second hand bike for ₹16,000. If its rate depreciates at 5% per year. What will be its value after 2 years ?
4. The cost of LED TV was ₹16,000 during 2018. In next year (2019), the price was hiked by 5%. In next year (2020), the cost was reduced by 4%. What is cost of LED TV in 2020 ?
5. Population of town is 1,50,000. The annual birth rate is 5% and mortality rate is 3%. Find the population after 2 years.

## 7.8 Financial Awareness

Mr. Pritpal planned a dinner for his family. After having dinner, his younger daughter Tavleen, a student of 8th class, anxiously asked her father that why had he paid more money than the actual amount of food. Then Mr. Pritpal told her that we had to pay some taxes to the government which is used for developing roads, infrastructure and educational institutions for us. There are mainly two types of taxes - Direct Tax (levied on Income i.e. Income Tax, Wealth Tax) and Indirect Tax (levied on items other than income). Tavleen was curious to know about these in detail. Mr. Pritpal informed her that previously, we were mainly dealing with various indirect taxes such as Excise, VAT and Sales Tax, which are different forms of consumer tax. However, the ways and form in which they were levied on consumer, differed. Presently, many of these taxes have been merged into a single tax called as GST.

**GST (Goods & Services Tax)-** GST came into effect from 1 July, 2017 through the 101th amendment in the constitution of India by Government of India. The GST replaced the erst-

while multiple taxes levied by the Central and State Governments. It is an indirect tax or consumption based tax used in India on the supply of goods and service. It is levied at every step in the production process, but refunded to all the parties engaged in various stages of production except the final consumer who actually bears the GST.

For collection, GST rates have been divided into five different tax slabs for collection of tax: 0%, 5%, 12%, 18% and 28%. However, some products like petroleum, alcoholic drinks and electricity are presently outside the purview of GST.

After explaining about GST, Mr. Pritpal showed her the restaurant bill in which 5% GST was imposed on food ordered for dinner. Thereafter, Tavleen was quite happy to learn new information.

## *Exercise* **7.8**

### Multiple Choice Questions :

1. GST stands for .....  
(a) Goods and Sales Tax (b) Gross Sales Tax  
(c) Goods and Service Tax (d) Gross Service Tax
2. GST is effective in India from.....  
(a) 1 July 2010 (b) 1 July 2017  
(c) 1 July 2019 (d) 1 July 2018
3. How many different tax slabs are there in GST?  
(a) 1 (b) 8  
(c) 3 (d) 5
4. Which of the following is not a tax slab under GST?  
(a) 0% (b) 6%  
(c) 5% (d) 12%
5. Which amendment of the constitution is related to GST?  
(a) 91st (b) 102nd  
(c) 101st (d) 100th
6. Which of the following is taxed under GST?  
(a) Food (b) Petroleum Products  
(c) Alcoholic drink (d) Electricity

### Operating Your Account

Keeping money in bank account provides safety to your hard-earned money. Apart from this, bank gives some interest on your deposit and generates income on your savings. Banks also facilitates transfer of funds from one account to another as per the instructions of the account holder. Through bank, we can manage our expenditure. Banks offer various type of accounts such as Savings and Current Accounts.

- Saving Accounts can be opened by an individual or jointly by two or more people with an aim to save money.
- Current Account is mostly opened by businessmen and institutions.

In this section, we shall learn how to deposit and withdraw money from a bank account.

## Depositing and Withdrawing Money :-

Operating a Current or Savings account is very easy. We can deposit and withdraw money either by going to the bank or using an ATM. The same can also be done through internet and mobile banking. Today we will learn the basic steps of depositing and withdrawing money at branch of a bank.

**Making a deposit :-** If we want to deposit money into our bank account, we can use Cheque or deposit slip. If we receive a cheque, we can deposit it with our bank through the clearing system or we can make a deposit of money by bank deposit slip.

**Filling deposit slip -** Shweta went to a bank with her son Aryan, who studies in 8th class, for depositing some money. Aryan was very excited as he was going first time in a bank. After reaching at the bank, Shweta showed her some bank slips like deposit slips and withdrawal slips and explained him about them in detail.

## Bank Deposit Slip

The image shows a standard bank deposit slip form. It includes fields for branch name, date, account type, account number, and the amount to be deposited in both words and figures. There is a section for breaking down the amount into different currency denominations. The form also has spaces for the depositor's signature and the bank's signature and stamp. Numbered circles 1 through 10 are placed over various fields to identify them for the accompanying table.

Circled Number	Detail
1	Name of the Bank's Branch
2	Date (of deposit)
3	Paid in to the credit of (Nature of account)
4	A/c holder's name
5	Amount of deposit in words
6	A/c No. (Account Number)
7	Amount of deposit in figures
8	Signature of depositor
9	Cash/Cheque (method of deposit)
10	Denomination (breakup of amount in different currency notes)



Firstly, she showed him a bank deposit slip and told him that a bank deposit slip is a small piece of paper form that a person has to submit while depositing money into a bank account.

Bank deposit slip has two parts - the right side is for bank's use and left side is for depositor's record.

Let us understand the details to be filled up on the Bank's copy. Most of the information is filled on right side.

**Note:-** No authorization is required for depositing money, anyone can deposit money into anyone's account.

The main purpose of a deposit slip is that it tells the cashier that we have to deposit the money in which bank account number.

**Making a Withdrawal :** To withdraw money we can write a cheque made out to 'cash' and then put date and sign it, we would deposit endorse the cheque and give it to the bank employee, who will give us cash.

### Bank Withdrawal Slips:-

After telling about bank deposit slips, she showed her bank withdrawal slips.

**Savings Account Withdrawal Form**

बचत खाता निकासी पत्र

शाखा/Branch..... तिथि/Date **5 April** 20 **21**

मुझे हमें पात्र Pay Self/us Rupees. **Two Thousand Only**

व राशि मेरे हमारे निम्नलिखित बचत खाते नामे करे and debit my/our following saving account रु का भुगतान करे।

बचत खाता नं / H.S.S. A/c No **14502**

हस्ताक्षर Signature : **Shweta**

नाम : **( Shweta )**

Ledger Keeper Officer **1** Folio

- A withdrawal slip is a bank document on which a person writes the date, account number and amount of money to withdraw from a bank."

Here are some restrictions on the use of a withdrawal slip. These are:

- Only the account holder can use this slip to withdraw the amount for one self.
- This slip / form cannot be used to make payment to others.

Circled Number	Detail
1	Name of the Account Holders
2	Date (of withdrawal)

Circled Number	Detail
3	Account Number in the Bank
4	Amount of withdrawal in words
5	Amount of withdrawal in figures
6	Signature of Account Holder

We can also withdraw the money through an ATM (Automated Teller Machine). To withdraw money, put your ATM card into the machine, enter your PIN (Personal Identification Number) and specify the amount of cash you would like. Shweta further explained that nowadays many people are using mobile phones and they can transfer funds from one account to another and make payments.

**Passbook :** All these deposit and withdrawal entries are printed by the bank on a "Bank Passbook" which is provided to us at the time of opening the account.

## *Exercise* 7.9

### Multiple Choice Questions :

1. When an account is opened in two names, the account is known as.....
  - a) Two Accounts
  - b) Dual Account
  - c) Duo Account
  - d) Joint Account
2. For taking cash out of an account, we have to fill a ..... slip.
  - a) Passbook
  - b) Cheque
  - c) Withdrawal
  - d) Deposit
3. ATM stands for.....
  - a) Automated Teller Machine
  - b) Auto Telling Machine
  - c) Auto Teller Machine
  - d) Automated Telling Machine
4. PIN stands for.....
  - a) Personal Identity Number
  - b) Personal Identification Number
  - c) Person Identity Number
  - d) Personal identity Number
5. For putting cash into an account, we have to fill a ..... slip.
  - a) Passbook
  - b) Cheque
  - c) Withdrawl
  - d) Deposit
6. .... lists the transactions carried out in the account.
  - a) Deposit
  - b) Passbook
  - c) Withdrawl
  - d) Cheque



## Learning Outcomes

*After completion of this chapter, students are now able to:*

- Understand concept of ratio and percentage.
- Understand concept of marked price (M.P.)
- Understand about discount their percentage and their application in daily life.
- Understand sales tax and its applications in daily life.
- Understand simple and compound interest and their applications in daily life.
- Understand about bank passbook and how to fill deposit and withdrawal slips.



## Answers

### Exercise 7.1

- (i) 1 : 3 (ii) 1 : 1000 (iii) 15 : 1 (iv) 12 : 1 (v) 1:5 (vi) 1:40
- 10 3. 26 4. 30%
- (i)  $33\frac{1}{3}\%$  (ii) 80% (iii) 50% (iv) 40% (v) 125% (vi) 20%
- ₹2500 7. 6 matches 8. (i) Carrom = 24 (ii) Chess : 9, other games = 27
- (i) b (ii) a (iii) a (iv) d (v) c

### Exercise 7.2

- ₹80,  $41\frac{2}{3}\%$  2. ₹113, 14.29% 3. ₹32, ₹188 4. 5%
- ₹624 6. ₹900 7. Discount = ₹32, C.P = ₹368
- ₹255
- (i) b (ii) a (iii) b (iv) b (v) c

### Exercise 7.3

- ₹480 2. ₹32

### Exercise 7.4

- ₹39420 2. 12% 3. ₹24000 4. ₹800
- ₹462
- (i) b (ii) c (iii) b (iv) d



### Exercise 7.5

1. 2 years                      2. 50%                      3. ₹1500, ₹16500

### Exercise 7.6

1. ₹2940                      2. ₹728  
3. (i) b                      (ii) b                      (iii) d                      (iv) c                      (v) b

### Exercise 7.7

1. ₹ 8,10,000; ₹1,90,000                      2. ₹705600                      3. 14440  
4. ₹16128                      5. 156060

### Exercise 7.8

1. c                      2. b                      3. d                      4. c                      5. c                      6. a

### Exercise 7.9

1. d                      2. c                      3. a                      4. b                      5. d                      6. b