

CHAPTER



FINANCIAL ARITHMETIC

Student Learning Outcomes

After studying this unit, students will be able to:

- Explain property tax and general sales tax.
- Solve tax-related problems.
- Explain Profit and markup.
- Find the rate of profit/markup per annum.
- Solve real life problems involving profit/markup.
- Define zakat and ushr.
- Solve problems related to zakat and ushr.

7.1 Taxes

Government needs money to run a state. For this purpose, government collects an amount from the public and provides them facilities like security, hospitals, education, defense, roads, parks, etc. This amount is called a tax. We pay different types of taxes in Pakistan but here we shall, discuss only property and general sales tax.

7.1.1 Property Tax and General Sales Tax

• Property Tax

The tax which is received on a property is called the property tax. Property tax is a provincial tax paid on the value of a property. It is generally paid at a flat rate of 2% but the tax rates vary, depending on the province.

Example 1: Find the property tax on a property of Rs.6,200,000 at the rate of 0.8%.

Solution:

Worth of the property = Rs.6,200,000

Tax rate = 0.8%

Property tax = ?

Property tax = 0.8% of Rs.6,200,000

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$$= \frac{8}{1000} \times 6,200,000$$

$$= \text{Rs.}49,600$$

Example 2: Raheem paid Rs. 8,676 as a property tax at the rate of 2%. Find the worth of Raheem's property.

Solution:

Property tax = Rs. 8,676

Tax rate = 2%

Worth of the property = ?

By using the unitary method

2% of the worth of property = Rs. 8,676

$$1\% \text{ of the worth of property} = \text{Rs.} \left(\frac{8,676}{2} \right)$$

$$100\% \text{ of the worth of property} = \text{Rs.} \left(\frac{8,676}{2} \times 100 \right) = \text{Rs.} 433,800$$

The worth of Raheem's property is Rs. 433,800.

• General Sales Tax

"The tax a buyer pays to the seller at the time of buying things is called general sales tax". General sales tax is imposed by the government on the percentage of the selling prices of things. In Pakistan, its rate varies from 0% to 25% depending on exemptions and types of industry.

In Pakistan some basic items including wheat, rice, pulses, vegetables, meat, poultry, books, drugs, etc. are exempted from the general sales tax.

Example 3: Saleem bought a car for Rs. 875,000 and paid 16% as a tax. How much tax did he pay?

Solution:

Price of the car = Rs. 875,000

Tax = 16%

General sales tax = ?

Remember

The standard rate of sales tax in Pakistan is 16%.

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$$\text{GST} = 16\% \text{ of Rs.}875,000$$

$$= \frac{16}{100} \times 875,000$$

$$= (16 \times 8750) = \text{Rs. } 140,000$$

Example 4: The price of a mobile is Rs.8,800 inclusive of a 10% GST. What is the original price of the mobile?

Solution:

$$\text{Price of the mobile} = \text{Rs.}8,800$$

$$\text{GST rate} = 10\%$$

$$\text{Original price} = ?$$

$$\text{Price \% of the mobile} = 100\% + 10\% = 110\%$$

By using the unitary method

$$110\% \text{ price of the mobile} = \text{Rs.}8,800$$

$$1\% \text{ price of the mobile} = \text{Rs.} \left(\frac{8,800}{110} \right)$$

$$100\% \text{ price of the mobile} = \text{Rs.} \left(\frac{8,800}{110} \times 100 \right) = \text{Rs. } 8,000$$

Thus, the original price of the mobile is Rs.8,000.

EXERCISE 7.1

- Calculate the price that a customer has to pay for each article with a 16% general sales tax imposed on it.
 - Football = Rs.800
 - Rackets = Rs. 1,250
 - Hockey = Rs. 1,650
 - Bat = Rs.2,100
- Find the property tax on a property of worth Rs.948,000 at the rate of 1.5%.
- Haris paid the property tax of Rs.2,068 at the rate of 0.8%. Find the worth of property.
- Property tax Rs. 18,720 was paid when the worth of property is Rs. 1,560,000. Find the percentage of property tax.
- The price of a toy including 5% general sales tax is Rs.945. Find the original price of the toy.

- Find the property tax on a property of Rs.650,000 at the rate of 1.8%.
- Farah paid the property tax of Rs. 9,240 at the rate of 2%. Find the worth of her property.
- The price of a bicycle is Rs.6,480 inclusive 8% GST. What is the original price of the bicycle?

7.2 Profit and Markup

We know that in a business, generally goods are bought at a certain price and sold at a higher price. In such a case, there is a gain, i.e.

$$\text{Sale price} - \text{Cost price} = \text{Gain}$$

While discussing this gain, we often use two different terms, profit and markup. To understand the difference between these two terms, let us learn them one by one.

• Profit

A profit means what we have earned after selling a thing. It is calculated as a percentage of the cost price as shown below.

$$\text{Profit}\% = \frac{\text{Gain}}{\text{Cost price}} \times 100\%$$

• Markup

In our daily life, we often borrow money from our friends and relatives to buy a thing that we repay them after a certain period. Some banks and retail organizations also provide the same services and charge an additional amount called markup.

“A markup is an amount added to a cost price to calculate the sale price.”

Usually, we calculate the markup as a percentage of the actual amount paid for a thing. This is called the markup rate and paid amount itself is called the principal. Suppose “P” is the principal, “T” is the time period and “R” is the markup rate, then the amount of markup will be:

$$\text{Markup} = \frac{\text{RPT}}{100}$$

Example 1: Ada bought a jewelry set for Rs.84,000 and sold for Rs.85,500. Find the percentage of profit.

Solution:

$$\text{Cost price (C.P)} = \text{Rs.84,000}$$

$$\text{Sale price (S.P)} = \text{Rs.85,500}$$

$$\begin{aligned} \text{Gain} &= \text{Sale price} - \text{Cost price} \\ &= \text{Rs.85,500} - \text{Rs.84,000} = \text{Rs. 1,500} \end{aligned}$$

$$\begin{aligned} \% \text{Profit} &= \frac{\text{Gain}}{\text{Cost price}} \times 100\% \\ &= \left(\frac{1,500}{84,000} \times 100 \right) \% = 1.79\% \end{aligned}$$

Example 2: Aleem bought a television for Rs. 15,000 on installments at the markup rate of 12% per annum. Find the selling price of the television if time period is 3 years.

Solution:

$$\text{Cost price (P)} = \text{Rs. 15,000} ; \text{ Markup rate} = 12\% \text{ per annum}$$

$$\text{Time period (T)} = 3 \text{ years} ; \text{ Price of the Television} = ?$$

Using the formula,

$$\text{Amount of the markup} = \frac{\text{RPT}}{100} = \frac{12 \times 15,000 \times 3}{100} = \text{Rs. 5,400}$$

$$\begin{aligned} \text{Price of the television} &= \text{cost price} + \text{markup} \\ &= \text{Rs. 15,000} + \text{Rs. 5,400} = \text{Rs. 20,400} \end{aligned}$$

Example 3: Imran sold a bicycle for Rs. 3,978 and got 17% profit. Find the cost price of the bicycle.

Solution:

$$\text{Sale price (S.P)} = \text{Rs.3,978}$$

$$\% \text{ Profit} = 17\%$$

By using formula,

$$\text{Cost price (C.P)} = \frac{\text{Sale price}}{(100\% + \text{Profit}\%)}$$

$$\text{Cost price (C.P)} = \left(\frac{3978}{117} \times 100 \right) = \text{Rs. 3,400}$$

Example 4: Hatim bought a bike for Rs. 135,000 and sold at 62% profit. Find the sale price of the bike.

Solution:

Method I

$$\% \text{ profit} = 62\%$$

$$\text{Cost price} = \text{Rs.135,000}$$

$$\text{Sale price} = ?$$

$$\begin{aligned} \text{Sale price} &= (100\% + 62\%) \times 135,000 \text{ rupees} \\ &= 162\% \times 135,000 \text{ rupees} \end{aligned}$$

$$= \left(\frac{162}{100} \times 135,000 \right) = \text{Rs. 218,700}$$

Method II

$$\% \text{Profit} = \frac{\text{Profit}}{\text{Cost price}} \times 100$$

$$62 = \frac{\text{Profit}}{135,000} \times 100$$

$$\text{Profit} = \left(\frac{62 \times 135,000}{100} \right) \text{ rupees}$$

$$= \text{Rs. 83,700}$$

We know that;

$$\text{Sale price} = \text{cost price} + \text{profit}$$

$$= \text{Rs.135,000} + \text{Rs.83,700}$$

$$= \text{Rs.218,700}$$

Example 5: Find the markup on a thing whose price is Rs. 45,000 for 73 days at the rate of 10% per annum.

Solution:

Principal (P) = Rs. 45,000, Markup rate (R) = 10% per annum, Markup = ?

$$\text{Time period} = 73 \text{ days} = \frac{73}{365} \text{ year} = \frac{1}{5} \text{ year}$$

$$\begin{aligned} \text{By using the formula: Markup} &= \frac{RPT}{100} \\ &= \text{Rs. } \frac{10 \times 45,000 \times \frac{1}{5}}{100} \\ &= \text{Rs. } \frac{10 \times 45,000 \times 1}{100 \times 5} = \text{Rs. } 900 \end{aligned}$$

Example 6: The markup on a principal amount is Rs. 820 for 6 months at the rate of 12.5% per annum. Calculate the principal amount.

Solution:

Markup = Rs. 820 Markup rate (R) = 12.5%

$$\text{Time period (T)} = 6 \text{ months} = \frac{6}{12} \text{ year} = \frac{1}{2} \text{ year}$$

Principal amount (P) = ?

$$\begin{aligned} \text{By using the formula: Markup} &= \frac{RPT}{100} \\ 820 &= \frac{12.5 \times \frac{1}{2} \times P}{100} \\ \text{Principal amount} &= \frac{820 \times 100 \times 2}{12.5 \times 1} = \text{Rs. } 13,120 \end{aligned}$$

EXERCISE 7.2

- Find the missing quantities by using the formula

	Markup	Principal	Time Period	Markup rate
(i)	<input type="text"/>	Rs. 500	2 years	12%
(ii)	Rs. 205	<input type="text"/>	1 year	8%
(iii)	Rs. 528	Rs. 1,650	10 years	<input type="text"/>
(iv)	Rs. 350	Rs. 3,500	<input type="text"/>	2.5%
(v)	<input type="text"/>	Rs. 100,000	3 years	1.25%
(vi)	Rs. 1,050	<input type="text"/>	5 years	4.5%

- Adnan bought 96 eggs at the rate of Rs.40 per dozen and sold at the rate of Rs.4 per egg. Find the percentage of profit, if 3 eggs were rotten.
- If 16% profit on a mobile set is Rs.832. Find the cost price of the mobile set.
- Zia bought an out of order clock for Rs.750 and got it repaired for Rs.425. What should be the selling price of the clock if Zia wants to earn 25% profit?
- Find the markup on a principal amount of Rs. 75,500 at the rate of 9% per annum for 4 years.
- Ujala bought a car for Rs.280,000 and spent Rs. 12,000 more on it. What should be the selling price if she wants to get 7.5% profit?
- The price of a bicycle including markup is Rs. 5610. If the markup rate is 5% per annum, find the amount of markup for 146 days.
- Khushi bought a computer for Rs. 100,000 and paid a markup of Rs. 25,000 for 2 years. What markup rate did she pay?

7.3 Zakat and Usher

Zakat and Ushr are levied as ordered in the Holy Qur'an and Sunnah. Let us discuss them one by one.

- **Zakat**

Zakat is one of the five pillars of Islam which is ordered by Almighty Allah which is paid on the wealth which remains with a person for a complete year. Islam has fixed its rate, that is 2.5%.

Nisab (minimum limit of wealth that attracts liability of Zakat) in case of gold is 7.5 tolas and in case of silver is 52.5 tolas.

Example 1: Calculate the amount payable as Zakat by Haleem who saves Rs.949,000 for one year.

Solution:

$$\begin{aligned} \text{Total Saving} &= \text{Rs.}949,000 \\ \text{Rate of Zakat} &= 2.5\% \\ \text{Amount of Zakat} &=? \\ \text{Amount of Zakat} &= 2.5\% \text{ of Rs.}949,000 \end{aligned}$$

$$\begin{aligned} &= \left(\frac{2.5}{100} \times 949,000 \right) \text{ rupees} \\ &= \left(\frac{25 \times 949,000}{1,000} \right) \text{ rupees} = \text{Rs. } 23,725 \end{aligned}$$

Thus, Haleem will pay Rs.23,725 as Zakat.

Example 2: Find the wealth of Ibrahim if he paid Rs.7,500 as Zakat.

Solution:

$$2.5\% \text{ of Ibrahim's wealth} = \text{Rs.}7,500$$

$$1\% \text{ of Ibrahim} = \text{Rs. } \frac{7,500}{2.5}$$

$$100\% \text{ of Ibrahim} = \text{Rs. } \frac{7,500}{2.5} \times 100 = \text{Rs.}300,000$$

- **Ushr**

Ushr means one-tenth. It is paid on agricultural products. It is paid at the rate of 10% of the produce in case a piece of land irrigated by natural sources like rain, springs, streams, etc. However, the rate of Ushr is one-half, i.e. 5% of the entire produce in case

a piece of land watered by artificial means of irrigation such as wells, buckets, tube well, etc.

Nisab (minimum amount of agricultural produce) which is liable to Ushr is 948kg in weight. If the produce is less than that, no Ushr is chargeable.

Example 3: A farmer sold his crop of wheat for Rs.995,400. Find the amount of Ushr at the rate of 10%.

Solution:

$$\begin{aligned} \text{Total Amount} &= \text{Rs.}995,400 \\ \text{Rate of Ushr} &= 10\% \\ \text{Amount of Ushr} &=? \\ \text{Amount of Ushr} &= 10\% \text{ of Rs.}995,400 \end{aligned}$$

$$= \left(\frac{10}{100} \times 995,400 \right) = \text{Rs. } 99,540$$

Thus, amount of Ushr is Rs.99,540

Example 4: Adnan sold mangoes and paid Rs. 3,675 as the amount of Ushr at the rate of 5%. Find the sale price of the mangoes.

Solution:

$$\begin{aligned} \text{Amount of Ushr} &= \text{Rs.}3,675 \\ \text{Rate of Ushr} &= 5\% \\ \text{Amount of mangoes} &=? \\ 5\% \text{ of mangoes amount} &= \text{Rs. } 3,675 \end{aligned}$$

$$1\% \text{ of mangoes amount} = \text{Rs.} \left(\frac{3,675}{5} \right)$$

$$\text{Price of mangoes} = \text{Rs.} \left(\frac{3,675}{5} \times 100 \right)$$

$$\text{Price} = \text{Rs. } 73,500$$

Thus, the amount of mangoes is Rs.73,500

EXERCISE 7.3

1. An amount of Rs.62,480 remained with Nosheen for a complete year. How much Zakat will she pay?
2. Saba paid Rs.2,250 as Zakat. What is the worth of her wealth?
3. Nadeem paid Rs.6,075 as Zakat. How much wealth did he have?
4. Saleem earned Rs. 114,700 from a rice crop and paid Ushr at the rate of 5%. What amount did he pay as Ushr?
5. Nabeel sold apples for Rs.398,160 and paid 10% as Ushr. Find the amount of Ushr.
6. Shama's annual saving is Rs. 222,000. What is the amount of Zakat to be paid by her?
7. Nahal paid Rs.7,895 as Ushr at the rate of 10%. What amount did she earn?
8. Calculate the amount payable as Ushr by a farmer who earned Rs.88,460. Find the actual amount, if rate of Ushr is 5%.

Review Exercise 7

1. Answer the following questions.
 - (i) What is meant by the tax?
 - (ii) Define the general sales tax.
 - (iii) What is the difference between profit and markup?
 - (iv) What rate of Zakat has Islam fixed?
 - (v) What is Ushr?
2. Fill in the blanks.
 - (i) The tax which is received on a property is called the_____.
 - (ii) The tax a buyer pays to the seller at the time of buying things is called _____.
 - (iii) An amount added to a cost price to calculate the sale price is called a _____.
 - (iv) Zakat and Ushr are levied as ordered in the____ and Sunnah.
 - (v) A markup is an amount added to _____to calculate the sale price.

3. Tick (✓) the correct answer.
 4. Calculate the amount of property tax of a house at the rate of 2%. The value of the house is Rs. 1,450,000.
 5. Adnan has paid Rs. 16,000 as a property tax at the rate of 1.6%. Find the value of his property.
 6. The price of a toy is Rs.500. Find the sale price of the toy if GST is 16%.
 7. Nabeel bought a bag for Rs.4,000 and paid Rs.560 more as GST. Find the percentage of GST.
 8. Nadeem sold a bicycle for Rs.4,500 with markup of 25%. Find the cost price of bicycle.
 9. A shopkeeper sold a calculator for Rs.900 and earned 22% profit. Find the actual price of a calculator.
 10. Komal saves Rs.96,000 in a year. How much will she pay as Zakat?
 11. Saleem has 2,400kg wheat. The price of wheat is Rs.30kg. Find the Ushr that he will pay.

Summary

- A tax is a fee charged on the public at the rate fixed by a government to run its affairs.
- The tax which is received on property is called the property tax.
- The tax a buyer pays to the seller at the time of buying things is called general sales tax.
- An amount added to a cost price to calculate the sale price is called a markup.
- A profit means what we have earned after selling a thing.
- Zakat is one of the five pillars of Islam which is ordered by Almighty Allah which is paid on the wealth which remains with a person for a complete year. Islam has fixed its rate, that is 2.5%.
- Ushr means one-tenth. It is paid on agricultural products.