



Percentages

9.1. TAXES

The government of a country has responsibilities to provide some basic facilities and services to the people. These are water, electricity, roads, transportation and many others. For that, government needs money. Therefore, it deducts some percentage of amount from the salary or wages earned by the people of the country. This percentage of amount deducted is called tax. When there are more than one kind of tax, we call taxes.

The government of the country uses this money gained through taxes for the development of the country.

Taxes are of two types:

- Direct taxes
- Indirect taxes

Direct tax is levied directly on income of a person or an organisation. This tax, however, is not levied on the entire income of an individual. It is levied on a certain percentage of income called the 'taxable income'. The remaining percentage of income is called 'tax-free income'.

Indirect tax is the tax levied on goods and services.

Example 1. *Mrs. Esther's income is 200,000 L\$ per month. Out of this amount 120,000 L\$ is given to her as tax-free income. Calculate the amount of tax she will pay if she is taxed at the rate of 10% on the taxable income.*

Solution.

$$\text{Total income} = 200,000 \text{ L\$}$$

$$\text{Tax-free income} = 120,000 \text{ L\$}$$

$$\begin{aligned} \text{Therefore, taxable income} &= 200,000 \text{ L\$} - 120,000 \text{ L\$} \\ &= 80,000 \text{ L\$} \end{aligned}$$

$$\begin{aligned}\text{Tax} &= 10\% \text{ of } 80,000 \text{ L\$} \\ &= \frac{10}{100} \times 80,000 \text{ L\$} = 8,000 \text{ L\$}\end{aligned}$$

9.2. FINANCIAL PARTNERSHIP

A relationship between two or more **persons** who have agreed for setting up a business is known as **financial partnership**. The **persons** here are known as **financial partners**. There are two types of financial partners.

1. Active Partner
2. Silent Partner

An **active partner** is one who devotes his time for the business in addition to his investment.

A **silent partner** is one who merely invests money in the business.

A **'Firm'** is a name of the business under which all financial partners conduct their business activities.

The total money invested in a business is known as the **capital** of the business.

Basic Elements of Financial Partnership

There are mainly three basic elements of a financial partnership, which are explained below:

- 1. Agreement:** It is a verbal or written commitment on account of which financial partnership comes into existence.
- 2. Profit-sharing ratio:** An agreement among the financial partners to share profits or losses of the business.
- 3. Principal-agent relationship:** This is also an agreement which explains the duties and rights of each financial partner.

Partnership Deed

An agreement between the financial partners of a firm is known as partnership deed or **partnership agreement**.

A partnership deed provides the ratio in which the financial partners share their profits or losses.

I. Calculating shares when capitals are different but period is same. The following working rule explains the whole procedure.

- (i) Write the investments of the financial partners.

- (ii) Calculate profit-sharing ratio (ratio of the capitals of the financial partners). If there are n financial partners, and let $r_1 : r_2 : r_3 : \dots : r_n$ be their profit-sharing ratios. Let the total profit be L\$ P . Then, calculate the profit of each financial partner by using the following formulae.

$$\text{Profit of 1st partner} = \text{L\$ } \frac{r_1 P}{r_1 + r_2 + \dots + r_n}$$

$$\text{Profit of 2nd partner} = \text{L\$ } \frac{r_2 P}{r_1 + r_2 + \dots + r_n} \quad \text{and so on.}$$

Example 2. Three financial partners Terry, Thomas and Noel start a business and invest the money such that the investment of Terry is equal to four times the capital of Thomas and capital of Thomas is 6 times the capital of Noel. Find the share of each financial partner if the total profit is L\$ 478000.

Solution. Let the capital of Noel = L\$ x

$$\therefore \quad \text{Capital of Thomas} = \text{L\$ } 6x$$

$$\text{Capital of Terry} = \text{L\$ } (4 \times 6x) = \text{L\$ } 24x$$

The ratios of investments of Terry, Thomas and Noel = $24x : 6x : x$

$$\therefore \quad \text{Profit-sharing ratio} = 24 : 6 : 1$$

$$\text{Total profit} = \text{L\$ } 478000$$

$$\begin{aligned} \therefore \quad \text{Terry's share of profit} &= \frac{(24) \times 478000}{24 + 6 + 1} \\ &= \frac{11472000}{31} = 370064.51 \\ &\cong \text{L\$ } 3700065 \end{aligned}$$

$$\text{Thomas' share of profit} = \frac{6 \times 478000}{34 + 6 + 1} = \frac{2868000}{31} = 92516.12$$

$$\cong \text{L\$ } 92516$$

$$\text{Noel's share of profit} = \frac{1 \times 478000}{24 + 6 + 1} = \frac{478000}{31}$$

$$= 15419.35 \cong \text{L\$ } 15419$$

I. Calculating shares when capitals are different and period is also different. We adopt the following procedure.

- (i) Let there are n financial partners A, B, C, \dots who invested L\$ A_1, A_2, A_3, \dots for the months T_1, T_2, T_3, \dots respectively.
 (ii) Calculate the adjusted effective capitals of each partner A, B, C, \dots

The adjusted effective capital of A for one month

$$= A_1 \times T_1 = C_1, \text{ say,}$$

The adjusted effective capital of B for one month

$$= A_2 \times T_2 = C_2, \text{ say, and so on.}$$

- (iii) Calculate profit-sharing ratios = $C_1 : C_2 : C_3$.

- (iv) If the total profit is P , Then,

$$A's \text{ share of profit} = L\$ \frac{C_1 P}{C_1 + C_2 + \dots + C_n}$$

$$B's \text{ share of profit} = L\$ \frac{C_2 P}{C_1 + C_2 + \dots + C_n} \text{ and so on}$$

Example 3. *Esther, Annie and Fatu started their each own business and invested L\$ 25000 each and for 6, 8 and 12 months respectively.*

Find the share of profit of each partner if the total profit earned is L\$ 42625 after one year.

Solution. Here, $T_1 = 6$ months, $A_1 = L\$ 25000$
 $T_2 = 8$ months, $A_2 = L\$ 25000$
 $T_3 = 12$ months, $A_3 = L\$ 25000$

The adjusted effective capitals of Esther, Annie and Fatu are as under.

$$C_1 = A_1 \times T_1 = L\$ 25000 \times 6 = L\$ 1,50,000$$

$$C_2 = A_2 \times T_2 = L\$ 25000 \times 8 = L\$ 200000$$

$$C_3 = A_3 \times T_3 = L\$ 25000 \times 12 = L\$ 300000$$

$$\therefore \text{Profit-sharing ratios} = C_1 : C_2 : C_3 = 150000 : 200000 : 300000 \\ = 15 : 20 : 30 = 3 : 4 : 6$$

Here, total profit is $P = L\$ 42625$

$$\therefore \text{Esther share of profit} = \frac{3 \times 42625}{3 + 4 + 6} \\ = \frac{127875}{13} = 9836.53 \cong L\$ 9837$$

$$\text{Annie share of profit} = \frac{4 \times 42625}{3 + 4 + 6} = 13115.38 \cong \text{L\$ } 13115$$

$$\begin{aligned} \text{Fatu share of profit} &= \frac{6 \times 42625}{3 + 4 + 6} \\ &= 19673.076 \cong \text{L\$ } 19673. \end{aligned}$$

9.3. INTEREST (PROFIT) ON CAPITAL

A partnership deed is an agreement between the partners of a firm. This agreement explains the duties and rights of each partner and in addition, it provides the following information.

- (i) It states the proportion in which the profits of the business are to be shared.
- (ii) It states the salary, if any, of each partner.

Further, if the partnership deed provides interest on capitals, then, the interest is given out of the total profit of the company before it is distributed among all the partners. The remaining profit is then distributed among the partners in the agreed proportions.

Example 4. *Prince and Joseph entered into a partnership investing L\$12000 and L\$ 15000 respectively. The partnership agreement provides for 3% interest on capitals.*

Find the share of each partner if the total profit earned is L\$ 2700 after one year.

Solution. Since 3% interest is to be given on capitals invested by the partners, therefore,

$$\text{Prince interest} = 3\% \text{ of } 12000 = \frac{3}{100} \times 12000 = \text{L\$ } 360$$

$$\text{Joseph interest} = 3\% \text{ of } 15000 = 450$$

$$\therefore \text{Total interest to be paid to the partners} = 360 + 450 = \text{L\$ } 810$$

$$\text{Also, total profit} = \text{L\$ } 2700$$

$$\begin{aligned} \therefore \text{Profit after distributing interest to Prince and Joseph} \\ = 2700 - 810 = \text{L\$ } 1890 \end{aligned}$$

Hence, L\$ 1890 is to be distributed among the partners in the ratio of their capitals. Now,

$$\text{Ratio of the capitals} = 12000 : 15000 = 4 : 5$$

$$\therefore \text{Prince share of profit} = \frac{4}{4+5} \times 1890 = \text{L\$ } 840$$

$$\text{Joseph share of profit} = \frac{5}{4+5} \times 1890 = \text{L\$ } 1050$$

$$\text{Further, Prince got} = 840 + 360 = \text{L\$ } 1200$$

$$\text{Joseph got} = 1050 + 450 = \text{L\$ } 1500$$

Example 2. Three partners Joseph, Peter and Musu start a new business and invest L\$ 10000, L\$, 15000 and L\$ 20000 respectively as a capital. Joseph receives 15% of the profit as an active partner and Peter gets 10% as manager after which the remaining profits are divided in proportion of capitals invested by each. Find the shares of profit of Peter and Musu if it is given that Hector receives L\$ 2394 as a profit.

Solution. Let the total profit = L\$ x

$$\text{Joseph profit as an active partner} = 15\% \text{ of L\$ } x = \text{L\$ } \frac{15x}{100} = \text{L\$ } \frac{3x}{20}$$

$$\text{Peter profit as a manager} = 10\% \text{ of L\$ } x = \text{L\$ } \frac{x}{10}$$

$$\text{Extra profit of Joseph and Peter} = \frac{15x}{100} + \frac{x}{10} = \frac{25x}{100} = \text{L\$ } \frac{x}{4}$$

$$\therefore \text{Remaining profit} = \text{L\$ } \left(x - \frac{x}{4} \right) = \text{L\$ } \frac{3x}{4}$$

Hence, it is required to divide L\$ $\frac{3x}{4}$ among Joseph, Peter and

Musu in the ratio of their capitals invested.

$$\text{Ratio of invested capitals} = 10000 : 15000 : 20000 = 2 : 3 : 4$$

\therefore Joseph share of profit from the remaining profit

$$= \frac{2}{2+3+4} \times \frac{3x}{4} = \text{L\$ } \frac{x}{6}$$

Peter share of profit from the remaining profit

$$= \frac{3}{2+3+4} \times \frac{3x}{4} = \text{L\$ } \frac{x}{4}$$

Musu share of profit from the remaining profit

$$= \frac{4}{2+3+4} \times \frac{3x}{4} = \text{L\$ } \frac{x}{3}$$

Total share of profit received by Joseph

$$= \text{L\$} \left(\frac{x}{6} + \frac{3x}{20} \right) = \text{L\$} \frac{19x}{60} = \text{L\$} 2394 \quad | \text{ given}$$

$$\Rightarrow 19x = 2394 \times 60 = 143640$$

$$\Rightarrow x = \frac{143640}{19} = \text{L\$} 7560$$

$$\therefore \text{Total profit} = \text{L\$} 7560$$

Total share of profit received by Peter

$$= \text{L\$} \left(\frac{x}{4} + \frac{x}{10} \right) = \text{L\$} \frac{7x}{20}$$

$$= \text{L\$} \frac{7}{20} \times 7560 = \text{L\$} 2646$$

Total share of profit received by Musu

$$= \text{L\$} \frac{x}{3} = \text{L\$} \frac{7560}{3} = \text{L\$} 2520$$

9.4. BANKING

Banking plays an important role for the Economical growth of a country and it is, in fact, the remote control of the money market in the country.

A bank may be defined as a **financial institution** where money and other valuables are deposited for safe keeping. Individuals and organizations that keep their money at the bank are called **customers**. A bank accepts money from its customers in the form of deposits which are usually repayable on demand or after a fixed period. Banks give safety to the deposits of its customers.

Transactions and Services Provided by a Bank

The basic transactions and services provided by a bank are:

I. Handling Different Types of Deposits

The bank collects deposits from the public. These deposits can be of different types as explained below:

(i) Savings deposit: This type of deposit encourages saving habit among the public. Excess money that will not be needed immediately is deposited into the account. The banks lend savings deposits to other customers as loans or overdrafts and charge interest on them. When the loan is paid back, the interest becomes profit for the banks. The

bank then pays some of the profit as interest to the owner of the savings account.

Customers are allowed to withdraw part of their savings for use. *It is important that regular deposits are made into a savings account to keep the account active.* There is a minimum amount of money that must always be reserved in the account. This is known as the *minimum balance*. Savings account is suitable to salary and wage earners. It can also be opened in a single name by an individual or in joint names by groups and organizations.

(ii) Current deposit: This type of account is operated by businessmen. People who operate current account can withdraw money from their account more than once daily. The bank issues cheque books to current account holders which they fill and sign whenever they want to make withdrawals.

The banks are not allowed to lend deposits from current accounts as loans. No interest is paid on this account. Therefore, unlike savings deposits, banks do not earn interest or profits from current deposits. Thus, they also do not pay any interest on the current deposits to the customers.

(iii) Fixed deposit: In this type of account, a huge amount of money is deposited at one time for a fixed term. Higher interest is paid on fixed deposits, which varies with the period of deposit. The owner of the account will not be allowed to withdraw any part of the deposit before the fixed period ends.

(iv) Recurring deposit: This type of account is operated by salaried persons and petty traders. A certain sum of money is deposited into the bank from time to time. The account holder is permitted to make withdrawals, only after the end of certain period. A higher rate of interest is paid on the deposits to the account holder.

II. Granting Loans and Advances

Banks advance loans to their customers, the business community and other members of the public. The rate charged is higher than what it pays on deposits. The difference in the interest rates is its profit. The common types of bank loans and advances are overdrafts and loans.

(i) Overdraft: This type of advance is given to current account holders. This means that they can withdraw more than they have in

their account. A certain amount is sanctioned as overdraft which can be withdrawn within a certain period of time say three months or more. Interest is charged on actual amount withdrawn. For example, if the balance in a certain current account is L\$ 1800 and the account holder drew a cheque of L\$ 2000 and it is honoured, it means he has overdrawn the account in excess of L\$ 200.

Loan: It is normally for a fixed term say a period of one year or a period of five years. Since recent times, banks also lend money for long term. Repayment of money can be in the form of installments spread over a period of time or in a lump sum amount.

Interest is charged on the actual amount sanctioned, whether withdrawn or not. The rate of interest may be slightly lower than what is charged on overdrafts and cash credits. Loans are normally secured against tangible assets of the person or company contracting the loan.

III. Issuing Bank Drafts and Demand Draft

A bank draft is a document issued by one bank against funds deposited into its account at another bank, authorizing the second bank to make payments to the individual named in the draft.

A **demand draft** is also a bank document but used by individuals to make/transfer payments from one bank account to another. A demand draft requires no signature in order to be cashed.

IV. Payment Cheque

It is a bank document that orders a bank to pay a specific amount of money from a person's account to the person whose name is mentioned on the document. A specimen copy of a payment cheque of Bank of Liberia and Prudential Bank Limited.

Ad Valorem duty: It is the import duty on goods. Let C.I.F. or F.O.B value is x , then, Ad Valorem duty = $x\%$ of C.I.F. or $x\%$ of F.O.B.

Example 6. A car was freight in United Kingdom for \$ 2206.98. The freight charges were \$ 325.86 and the insurance cost \$ 25. Find the C.I.F. value of the car. If the import duty on cars is 25% Ad valorem, find the duty on the car.

Solution. Here cost of the car = \$ 2206.98

Insurance charges = \$ 25

Freight charges = \$ 325.86

$$\therefore \text{C.I.F. Value} = 2206.98 + 25 + 325.86 = \$ 2557.84$$

Also, duty on the car = 30% of C.I.F. value

$$= \frac{30}{100} \times 2557.84 = 767.352 \cong \$ 767.$$

9.5. VALUE ADDED TAX (VAT)

The Value Added Tax (VAT) was introduced in 2013 by the provisions of **VAT act** (Act 870). This is an indirect tax and imposed on consumers when they purchase goods. The rate is 15% for businesses and individuals whose annual turnover is L\$ 120000 or above on the value of goods and services.

If the VAT rate on goods or services is $r\%$, Then,

$$\text{VAT} = r\% \text{ of VAT exclusive cost or}$$

$$\text{VAT} = r\% \text{ of Basic cost,}$$

where basic cost is the cost of item without VAT. We also define

$$\text{VAT} = \frac{r}{100+r} \times \text{VAT inclusive cost.}$$

National Health Insurance Levy (NHIL)

It is a levy imposed on goods and services supplied in or imported into the country. All goods and services are subject to the levy unless they are otherwise exempted. The levy is charged at a rate of $2\frac{1}{2}\%$. The NHIL

is collected by the Domestic Tax Revenue Division governed by Ghana Revenue Authority.

Example 7. George purchased a hair dryer for L\$ 230 including 15% VAT. Find the price of the hair dryer before VAT.

Solution. Let, the price of hair dryer before VAT = L\$ x

$$15\% \text{ of } x = \frac{15}{100} \times x = \frac{3x}{20}$$

As per given, VAT inclusive cost = L\$ 230

$$\Rightarrow x + \frac{3x}{20} = 230 \Rightarrow \frac{20x + 3x}{20} = 230$$

$$\Rightarrow 23x = 230 \times 20 = 4600$$

$$\Rightarrow x = \frac{4600}{23} = \text{L\$ } 200$$

\therefore The price of hair dryer before VAT = L\$ 200

Example 8. Peter brought a personal computer costing L\$ 1800 at L\$ 1980 after paying the VAT. Find the rate at which the VAT was charged.

Solution. VAT exclusive, price of the computer = L\$ 1800. VAT inclusive price of the computer = L\$ 1980

$$\therefore \text{VAT charged} = 1980 - 1800 = \text{L\$ } 180$$

Let r be the rate of VAT, then,

$$\text{VAT} = \text{rate\%} \times \text{VAT exclusive price of the computer}$$

$$\Rightarrow 180 = \frac{r}{100} \times 1800 \Rightarrow r = 10$$

\therefore The required VAT rate = 10%.

Example 9. The marked price of a coat and paint is L\$ 980. If the VAT on the coat is 10% and that on the paint is 5% and if the total VAT is L\$ 94, calculate the marked price of the coat and paint.

Solution. Let the marked price of the coat = L\$ x and the marked price of the paint = L\$ y

$$\text{As per given, } x + y = 980 \quad \dots(1)$$

VAT on the coat = 10% of marked price of the coat

$$= \frac{10}{100} \times x = \frac{x}{10} \quad \dots(2)$$

VAT on the paint = 5% of marked price of the paint

$$= \frac{5}{100} \times y = \frac{y}{20} \quad \dots(3)$$

Adding (2) and (3),

$$\text{Total VAT} = \frac{x}{10} + \frac{y}{20} = 94 \quad | \text{ Given}$$

$$\Rightarrow 2x + y = 1880 \quad \dots(4)$$

Subtracting (1) from (4), we get

$$x = 1880 - 980 = 900$$

Again, (1) gives $y = 980 - x = 980 - 900 = 80$

\therefore Marked price of the coat = L\$ 900

Marked price of the paint = L\$ 80

9.6. HOUSE HOLD BILLS

I. Calculation of Electricity Bill

The consumption of electrical energy by homes and small business is usually measured in kilowatt hours. Thus, the

$$\text{energy (E)} = \text{Power (P)} \times \text{time (t)}.$$

If the unit of power P is watt, and of time sec, then, the unit of energy E is watt second.

If the unit of power P is kilowatt (kW) and of time is hour, then, the unit of energy E is kilowatt hour (kWh).

Thus, one kilowatt-hour is the amount of electrical energy consumed by a 1 kW device in one hour.

For example, suppose 1.5 kW electrical heater runs for 2 hours, then, the energy consumed by the heater can be calculated as below:

$$\text{Here } P = 1.5 \text{ kW, } t = 2 \text{ hrs}$$

$$\therefore \text{Energy (E)} = (1.5 \text{ kW}) \times (2 \text{ hr}) = 3 \text{ kWh}$$

Example 10. Annie spends half an hour each day drying his hair with an electric hair dryer with a power rating of 1.5 kW. The unit cost of electricity is GHp 21 per kWh. Find how much Annie spent on drying his hair each (i) week (ii) month?

Solution. (i) Here $P = 1.5 \text{ kW}$, $t = 0.5 \text{ hour per day}$
 $= 7 \times 0.5 \text{ hours per week}$
 $= 3.5 \text{ hours per week}$

\therefore The energy used in one week is given as

$$E = P \times t = 1.5 \text{ (kW)} \times 3.5 \text{ (hours)}$$

$$= 5.25 \text{ kWh}$$

One unit cost = GHp 21 per kWh

$$\therefore \text{Total cost for one week} = 5.25 \times 21$$

$$= \text{GHp } 110.25 = \text{L\$ } 1.1025$$

(ii) Take one month = 30 days

$$\therefore t = 0.5 \text{ hour per day}$$

$$= 0.5 \times 30 = 15 \text{ hour per month}$$

The energy used in one month is given as

$$E = P \times t = 1.5 \text{ (kW)} \times 15 \text{ hr} = 22.5 \text{ kWh}$$

∴ Total cost for one month

$$= 22.5 \times 15 = \text{GHp } 337.5 = \text{L\$ } 3.375.$$

II. Calculation of Water Bill

The consumption of water by an individual or group of individuals is measured in kilolitre (kL). The rates as approved by the pure as published in Gazette No. 31, dated 2nd April 2015 are given in the following Table.

Table. Water Tariffs

| Category of Service Consumption | Monthly (1000 litres) | Approved Rates in Ghp/1000 litres |
|--|------------------------------|--|
| (a) Metered Domestic | 0–20 21 and above | 178.3326 267.3313 |
| (b) Commerical/Industrial | Flat Rate | 380.0075 |
| (c) Public Institutions/Govt. Departments | Flat Rate | 342.9438 |
| (d) Unmetered Premises-Flat rate per house per month | | 1160.7090 |
| (e) Premises without connection (Public stand pipes per 1000 litres) | | 176.3036 |
| (f) Special Commercial per 1000 litres | | 1080.6204 |

Example 11. In Liberia, water is charged according to the quantity used. A Typical Terrif in given below.

| Category | Rates in GHp/1000 litres |
|-----------------|---------------------------------|
| 0 kL – 9 kL | 178 |
| 10 kL – 25 kL | 267 |
| 26 kL – 45 kL | 380 |
| 45 kL and above | 392 |
| Service charge | Nil |
| VAT | 15% |

- (a) Gyamfua's monthly water consumption is 32000 litres. Calculate his monthly water bill including VAT @ 15%.
- (b) Find the amount he paid per kilolitre.

Solution. (a) Break 32000 litres = 32 kL into the different categories as listed in the given table.

In 0 kL – 9 kL category, the water he used = 9 kL

\therefore The amount he paid = $178 \times 9 = \text{GHp } 1602 = \text{L\$ } 16.02$

In 10 kL – 25 kL, category the water he used

$$= 16 \text{ kL } (9 + 16 = 25)$$

\therefore The amount he paid = $267 \times 16 = \text{GHp } 4272 = \text{L\$ } 42.72$

In 26 kL – 45 kL, category the water he used = 7 kL ($25 + 7 = 32$)

\therefore The amount he paid = $380 \times 7 = \text{GHp } 2660 = \text{L\$ } 26.60$

Total amount he paid = $16.02 + 42.72 + 26.60 = \text{L\$ } 85.34$

Also, VAT @ 15% of 85.34 = $\frac{15}{100} \times 85.34 = \text{L\$ } 12.801$

Hence, the total amount paid by him

$$= 85.34 + 12.801 = \text{L\$ } 98.141$$

(b) He paid L\$ 98.141 for 32 kL

\therefore for 1 kL, he will pay = $\frac{98.141}{32} = \text{L\$ } 3.07$

III. Calculation of Telephone Bill

Example 12. Mobile Telecommunication Network, Accra, Liberia, sends a bill for the services used by a consumer.

| Name: Ms. Emelia | Peak hours | off-Peak hours | Cost (in L\$) |
|--------------------------|------------|----------------|---|
| Local calls (in minutes) | 190 | 250 | 0.11 per minute |
| Data (in MB) | 12 | 15 | 0.2 for first 3 MB 0.15 for next 3 MB 0.1 for next 4 MB and above |
| STD calls (in minutes) | – | 8 | 1.10 per minute |

Assume that there is a standing charges of L\$ 18.50 and the off-Peak minutes are sold at 50% discount.

Find the amount of the Telephone bill which Emelia has to pay.

Solution. (i) Local calls charges (Peak)

$$= 190 \times 0.11 = \text{L\$ } 20.9 \quad \dots(1)$$

Local calls charges (off-Peak)

$$= 250 \times \left(0.11 \times \frac{50}{100} \right) = 250 \times \left(\frac{0.11}{2} \right) \\ = \text{L\$ } 13.75 \quad \dots(2)$$

(ii) Data charges (Peak)

$$\text{First 3 MB} = 3 \times 0.2 = \text{L\$ } 0.6 \quad \dots(3)$$

$$\text{Next 3 MB} = 3 \times 0.15 = \text{L\$ } 0.45 \quad \dots(4)$$

$$\text{Remaining 6 MB} = 6 \times 0.1 = \text{L\$ } 0.6 \quad \dots(5)$$

Data charges (off-Peak)

$$\text{First 3 MB} = 3 \times \left(\frac{0.2}{2} \right) = \text{L\$ } 0.3 \quad \dots(6)$$

$$\text{Next 3 MB} = 3 \times \left(\frac{0.15}{2} \right) = \text{L\$ } 0.225 \quad \dots(7)$$

$$9 \text{ MB} = 9 \times \left(\frac{0.1}{2} \right) = \text{L\$ } 0.45 \quad \dots(8)$$

(iii) STD calls charges (Peak) = Nil

$$\text{STD calls charges (off-Peak)} = 8 \times \left(\frac{1.10}{2} \right) = \text{L\$ } 4.4 \quad \dots(9)$$

(iv) Standing charges = L\$ 18.50 ...(10)

Adding (1), (2), ... (10), we have

∴ The total amount of Emelia's bill = L\$ 60.175

9.7. HIRE PURCHASE

The term **hire purchase** means a way of buying expensive goods such as T.V., Friz, Car, Flat etc. Using hire purchase, one pays a small amount in the beginning and the remaining amount to be paid by monthly or yearly installments.

Note: Buying of goods on hire purchase usually costs more to calculate the total hire purchase price, we add the deposit and the total of all of the installments.

Example 13. A pressure cooker can be bought on hire purchase price by paying a deposit of 35% and 36 monthly payments of L\$ 11.40. The cost of pressure cooker in cash price is L\$ 460. Find the hire purchase price of the pressure cooker.

Solution. Deposit amount = 35% of L\$ 460 = $\frac{35}{100} \times 460 = \text{L\$ } 161$

One installment cost = L\$ 11.40

\Rightarrow 36 installments cost = $36 \times 11.40 = \text{L\$ } 410.4$

\therefore Hire purchase price

= Deposit amount + Total installments cost

= $161 + 410.4 = \text{L\$ } 571.40$

Example 14. Electroland Liberia Limited (EGL) launched a new T.V. which costs L\$ 2,190 on cash payment. It is available on hire purchase price by paying a deposit of 15% followed by 12 installments of L\$ 178.50. Find the total hire purchase price and the extra money that you would pay (over the cash price) using hire purchase.

Solution. Deposit amount = 15% of L\$ 2,190 = $\frac{15}{100} \times 2190 = \text{L\$ } 328.5$

1 installment cost = L\$ 178.50

\therefore 12 installments cost = $178.50 \times 12 = \text{L\$ } 2,142$

\therefore Hire purchase price

= deposit amount + 12 installments cost

= $328.5 + 2142 = \text{L\$ } 2,470.5$

Given, cash price = L\$ 2,190

\therefore Extra amount to be paid

= Hire purchase price – Cash price

= $2470.5 - 2190 = \text{L\$ } 280.5$

Example 3. The cash price of a computer in Accra is \$ 550. The hire purchase price is \$ 625. If you pay a deposit of 15% followed by 20 equal monthly installments, find how much you pay (in L\$) per month. The rate of exchange is $\text{L\$}1 = \$ 0.257732$

Solution. Deposit amount = 15 % of \$ 550 = $\frac{15}{100} \times 550 = \$ 82.50$

∴ 20 installments cost

$$= \text{Hire purchase price} - \text{Deposit amount}$$

$$= 625 - 82.50 = \$ 542.50$$

$$\Rightarrow 1 \text{ installment cost} = \frac{542.50}{20} = \text{L\$ } 27.125$$

We need to find the cost of one installment in Liberia currency.

Given $\text{L\$ } 1 = \$ 0.257732$

$$\Rightarrow \$ 1 = \text{L\$ } \frac{1}{0.257732} = \text{L\$ } 3.879999379$$

$$\therefore \$ 27.125 = 3.879999379 \times 27.125$$

$$= \text{L\$ } 105.2449832$$

Thus, one has to pay = L\$ 105.25 per month.

EXERCISE

- Mr. James income is 2500,000 L\$ per month. The tax-free income is 150,000 L\$. He is taxed at the rate of 10% for the first 40,000 L\$ 15% for the next 40,000 L\$ and 20% on the remaining. Calculate the total amount of tax he will pay.
- Liberia Electronics limited is Governed by three partners James, Prince and Joseph. James receives $\frac{2}{3}$ of the total capital. Prince and Joseph divide the remainder equally. Frank's income is increased by L\$ 500 when the rate of profit rises from 5% to 7%. Find the capital of Prince and Joseph.
- Katumi, Kwame and Napoleon form a partnership to start a new business. Their shares are in the proportions $\frac{1}{3} : \frac{1}{4} : \frac{1}{5}$. Katumi withdraws half his capital at the end of 15 months and after 15 months more, a profit of L\$ 6580 is divided. Find the share of each partner.
- Sarah, Seidu and Benjamin created a new firm by investing capitals of L\$ 60000, L\$ 70000 and L\$ 85000 respectively. The partnership deed provides for 5% interest on capitals, an annual salary of L\$ 10000 to Sarah and travelling allowance of L\$ 3000 to Benjamin before distributing profit of the firm. If the profit earned

by the firm is L\$ 60000 and the partners agree to share the profits in their capital ratios, find the share of profit of each partner.

5. Joseph, Amadu, Alex and Jimmy entered into a partnership investing L\$ 55000, L\$ 55000, L\$ 45000 and L\$ 40000 for 6, 7, 8 and 4 months respectively Alex is an active partner and gets 10% of the total profit. Find the share of each partner if the total profit earned after a year is L\$25000.
6. Futa purchased an item for L\$ 330 including 10% VAT and a mobile accessory for L\$ 212 including 6% VAT. Find the marked price of the item and the mobile accessory.
7. The cost of a DVD player, inclusive of VAT and NHIL, is L\$ 625.50. The VAT is charged at the rate of 15% and NHIL at 2.5% respectively. Find
 - (a) the cost of DVD player (VAT and NHIL exclusive)
 - (b) The NHIL charged
 - (c) The VAT charged
8. How long will the following devices run on 1 kWh of energy?
 - (a) Hair dryer (1.5 kW)
 - (b) Television (150 W)
 - (c) Electric cooker (4 kW)
 - (d) Vacuum cleaner (800 W)
9. A DVD player is priced at L\$ 320 in different shops A and B which offer different hire purchase terms. Shop A requires 20% deposit and 12 monthly installments of L\$ 26.60. Shop B requires 30% deposit and 12 monthly installments of L\$ 23.50. Which shop has the better deal?