UNIT 1. INVENTORIES

1.1 INTRODUCTION

In the last section of Principles of Accounting I, you have learned about the principles and practices of accounting for receivables – one of the current asset items in the balance sheet of a retail business. In this unit you will learn and discuss the concepts in accounting for inventories.

Inventories are asset items held for sale in the ordinary course of business or goods that will be used or consumed in the production of goods to be sold. They are mainly divided into two major:

- Inventories of merchandising businesses
- Inventories of manufacturing businesses

i. Inventories of merchandising businesses are merchandise purchased for resale in the normal course of business. These types of inventories are called merchandise inventories.

ii. Inventories of manufacturing businesses manufacturing businesses are businesses that produce physical output. They normally have three types of inventories. These are:

- Raw material inventory
- Work in process inventory
- Finished goods inventory

1. ***Raw material inventory*** -is the cost assigned to goods and materials on hand but not yet placed into production. Raw materials include the wood to make a chair or other office furniture's, the steel to make a car etc.
2. ***Work in process inventory-*** is the cost of raw material on which production has been started but not completed, plus the direct labor cost applied specifically to this material and allocated manufacturing overhead costs.

3. ***Finished goods inventory-*** is the cost identified with the completed but unsold units on hand at the end of each period.

In this unit only the determination of the inventory of merchandise purchased for resale commonly called ***merchandise inventory*** will be discussed.

1.2 IMPORTANCE OF INVENTORIES

Merchandise purchased and sold is the most active elements in merchandising business, i.e. in wholesale and retail type of businesses. This is due to the following reasons:

1. The sale of merchandise is the principal source of revenue for them.
2. The cost of merchandise sold is the largest deductions from sales.
3. Inventories (ending inventories) are the largest of the current assets or those firms.

Because of the above reasons inventories, have effects on the current and the following period's financial statements. If inventories are misstated (understated of overstated), the financial statements will be distorted.

1.3 THE EFFECTS OF INVENTORIES ON CURRENT AND FOLLOWING PERIOD'S FINANCIAL STATEMENTS.

1.3.1 Effect of ending inventory on current period's financial statements

Ending inventory is the cost of merchandise on hand at the end of accounting period. Let us see its effect on current period's financial statements.

Income statement

a. ***Cost of goods (merchandise) sold =Beginning inventory + Net purchase – Ending inventory***

As you see, ending inventory is a deduction in calculation cost of merchandise sold. So, it has an indirect (negative) relationship to cost of merchandise sold, i.e. if ending inventory is understated, the cost of merchandise sold will be overstated, and if ending inventory is overstated, the cost of merchandise sold will be understated.

b. ***Gross Profit = Net sales – Cost of merchandise sold***

Here, the cost of merchandise sold had indirect relationship to gross profit. So, the effect of ending inventory on gross profit is the opposite of the effect on cost of merchandise sold. That is, if ending inventory is understated, the gross profit will be understated and if ending inventory is overstated, the gross profit will be overstated. This is a direct (positive) relationship.

c. Operating income = Gross Profit – Operating Expenses

Gross profit and operating income have direct relationships. Thus, the effect of ending inventory on net income is the same as its effect on gross profit, i.e. direct (positive) effect (relationship).

Balance Sheet

1. ***Current assets*** - Ending inventory is part of current assets, even the largest. So, it has a direct (positive) relationship to current assets. If ending inventory balance is understated (overstated), the total current assets will be understated (overstated). Since current assets are part of total assets, ending inventory has direct relationship to total assets.

2. ***Liabilities***- No effect on liabilities. Inventory misstatement has no effect on liabilities.

3. ***Owners' equity*** – The net income will be transferred to the owners' equity at the end of accounting period. Closing income summary account does this. So, net income has direct relationship with owners' equity at the end of accounting period. The effect-ending inventory on

owners' equity is the same as its effect on net income, i.e. if ending inventory is understated (Overstated), the owners' equity will be understated (Overstated).

1.3.2 Effects of beginning inventory on current period's financial statements

Beginning inventory is inventory balance that was left on hand in the previous period and transferred to the current period. Its effect is summarized below:

Income Statement

1. ***Cost of merchandise sold= Beginning inventory + Net Purchases – Ending inventory***

   As you see, beginning inventory is an addition in determining cost of goods sold. It has direct effect on cost of merchandise sold. That is, if the beginning inventory is understated (Overstated), the cost of merchandise sold will be understated (Overstated)

2. ***Gross Profit= Net Sales – Cost of merchandise sold***

   The effect of beginning inventory on gross profit is the opposite of the effect on cost of merchandise sold, i.e. indirect (negative) relationship. If the beginning inventory is understated, the gross profit will be overstated and if it is overstated, the gross profit will be understated.

3. ***Net income = Gross Profit – Operating expenses***

   The effect of beginning inventory on net income is the same as its effect on gross profit.

Balance sheet

1. ***Current assets*** – The inventory included in current assets is the ending inventory. So, beginning inventory has no effect on current assets.

2. ***Owners' equity*** - If the effect comes from the previous year, the beginning inventory will not have an effect on ending owners' equity since the positive or negative effect of the previous year will be netted off by the negative or positive effect of the current year. But if the error is made in the current period, it will have indirect effect on ending owners' equity.

1.3.3 Effect of ending inventory on the following period's financial statements

The ending inventory of the current period will become the beginning inventory for the following period. So, it will have the same effect as beginning inventory of the current period. Let us summarize it.

Income statement of the following period

Cost of merchandise sold → direct relationship

Gross profit → indirect relationship

Net income → indirect relationship

Balance sheet of the following period

The ending inventory of the current period will not have an effect on the following period's balance sheet items.

Illustration - 1

The following amounts were reported in Belay Company's financial statements for three consecutive fiscal year ended December 31.

	2000	***2001***	***2002***
a) Cost of merchandise sold	Br. 130,000	Br. 154,000	Br. 140,000
b) Net income	40,000	50,000	42,000
c) Total Current assets	210,000	230,000	200,000

d) Owner's equity 234,000 260,000
224,000

In making the physical counts of inventory, the following errors were made:

- Inventory on December 31,2000, under stated by Br. 12,000
- Inventory on December 31, 2001, overstated by Br. 6000

Required:

Determine the correct amount of the items listed above.

Solution

	2000	***2001***	***2002***
a) *Cost of merchandise sold*:			
Reported	Br. 130,000	Br. 154,000	Br. 140,000
Adjustment of 2000 error	(12,000)		12,000
2001 error		6,000	(6,000)
Corrected	Br. 118,000	Br. 172,000	Br. 136,000
b) *Net income:*			
Reported	Br. 40,000	Br. 50,000	Br. 42,000
Adjustment of 2000 error	12,000	(12,000)	
2001 error		(6,000)	6,000
Corrected	Br. 52,000	Br. 32,000	Br. 48,000
c) *Total current assets:*			
Reported	Br. 210,000	Br. 230,000	Br. 200,000
Adjustment of			

2000 error	12,000	_	
2001 error	_	(6,000)	
Corrected	Br. 222,000	Br. 224,000	Br. 200,000

d) *Owner's equity:*

Reported	Br. 234,000	Br. 260,000	Br. 224,000
Adjustment of			
2000 error	12,000	_	
2001 error	_	(6,000)	
Corrected	Br. 246,000	Br. 254,000	Br. 224,000

1.4 INVENTORY SYSTEMS: PERIODIC VS PERPETUAL

There are two principal systems of inventory accounting periodic and perpetual.

1.4.1 Periodic inventory system

Under this system there is no continuous record of merchandise inventory account. The inventory balance remains the same through out the accounting period, i.e. the beginning inventory balance. This is because when goods are purchased, they are debited to the purchases account rather than merchandise inventory account.

The revenue from sales is recorded each time a sale is made. No entry is made for the cost of goods sold. So, physical inventory must be taken periodically to determine the cost of inventory on hand and goods sold.

The periodic inventory system is less costly to maintain than the perpetual inventory system, but it gives management less information about the current status of merchandise.

This system is often used by retail enterprises that sell many kinds of low unit cost merchandise such as groceries, drugstores, hardware etc.

The journal entries to be prepared are:

1. *At the time of purchase of merchandise:*

Purchases	XX	}	at cost
Accounts payable or cash			XX

2. *At the time of sale of merchandise:*

Accounts receivable or cash	XX	}	at retail price
Sales			XX

3. *To record purchase returns and allowance:*

Accounts payable or cash	XX	
Purchase returns and allowance		XX

4. *To record adjusting entry or closing entry for merchandise inventory:*

Income Summary	XX	
Merchandise inventory (beginning)		XX

To close beginning inventory

Merchandise inventory (ending)	XX	
Income summary		XX

To record ending inventory

1.4.2 Perpetual inventory system

Under this system the accounting record continuously disclose the amount of inventory. So, the inventory balance will not remain the same in the

accounting period. All increases are debited to merchandise inventory account and all decreases are credited to the same account.

There are no purchases and purchase returns and allowances accounts in this system. At the time of sale, the cost of goods sold is recorded in addition to Journal entry for the sale. So, we can determine the cost of inventory as well as goods sold from the accounting record. No need of physical counting to determine their costs.

Companies that sell items of high unit value, such as appliances or automobiles, tended to use the perpetual inventory system.

Given the number and diversity of items contained in the merchandise inventory of most businesses, the perpetual inventory system is usually more effective for keeping track of quantities and ensuring optimal customer service. Management must choose the system or combination of systems that is best for achieving the company's goal.

Journal entries to be prepared are:

1. *At the time of purchase of merchandise*

Merchandise inventory		XX	at cost
Accounts payable/cash	XX		
To record cost of goods sold			

2. *At the time of sale of merchandise*

Accounts receivable or cash	XX		at retail price
Sales		XX	
To record cost of goods sold			

To record the sales			
Cost of goods sold	XX		
Merchandise inventory		XX	at cost

To record the cost of merchandise sold

3. *To record purchase returns and allowances*

Accounts payable or cash	XX	
Merchandise inventory		XX

4. No adjusting entry or closing entry for merchandise inventory is needed at the end of each accounting period.

Illustration – 2

In its beginning inventory on Jan 1, 2002, NINI Company had 120 units of merchandise that cost Br. 8 Per unit. The following transactions were completed during 2002.

February 5 Purchased on credit 150 units of merchandise at Br. 10 per unit.

9 Returned 20 detective units from February 5 purchases to the supplier.

June 15 Purchased for cash 230 units of merchandise at Br 9 per unit.

September 6 Sold 220 units of merchandise for cash at a price of Br. 15 per unit. These goods are: 120 units from the beginning inventory and 100 units for February Purchases.

December 31 260 units are left on hand, 30 units from February 5 purchases.

Required: Prepare general journal entries for NINI Company to record the above transactions and adjusting or closing entry for merchandise inventory on December 31,

a) Periodic inventory system
b) Perpetual inventory system

Solution

a) February 5	Purchases (150 x Br.10)	1,500	
	Account payable		1,500
9	Accounts payable (20 x Br. 10)	200	
	Purchase returns and allowances		200
June 15	Purchases (230 x Br. 9)	2,070	
	Cash		2,070
September 6	Cash (220 x Br. 15)		3,300
	Sales	3,300	
December 31	To record or close the merchandise inventory account		
	Income summary (120 x Br. 8)	960	
	Merchandise inventory (beginning)		960
	_To close the beginning inventory		
	Merchandise inventor (ending)	2,370	
	Income summary [(30 x Br. 10) + (230 x Br. 9)]		2,370
	_ To record the ending merchandise inventory		

b) February 5	Merchandise inventory	1,500	
	Accounts payable		1,500
9	Accounts payable	200	
	Merchandise inventory		200
June 15	Merchandise inventory		2,070
	Cash	2,070	
September 6	i) To record the sales		
	Cash	3,300	
	Sales		3,300
	ii) To record cost of merchandise sold		
	= (120 x Br. 8) + (100 x Br. 10)		
	= Br. 960 + Br. 1,000 = Br. 1,960		

Cost of merchandise sold	1,960	
Merchandise inventory		1,960

December 31 No entry is needed to record or close merchandise inventory account.

1.5 DETERMINING ACTUAL QUANTITIES IN THE INVENTORY

The physical count of inventory is needed under both inventory systems. Under periodic inventory system, it is needed to determine the cost of inventory and goods sold.

The inventory account under a perpetual inventory systems is always up to date. Yet events can occur where the inventory account balance is different from inventory on hand. such events include theft,, loss, damage, and errors. The physical count (some times called “taking an inventory”) is used to adjust the inventory ac count balance to the actual inventory on hand.

We determine a birr (dollar) amount for physical count of inventory on hand at the end of a period by:

(1) Counting the units of each product on hand
(2) Multiplying the count for each product by its cost per unit
(3) Adding the cost for all products

At the time of taking an inventory, all the merchandise owned by the business on the inventory date, and only such merchandise, should be included in the inventory. The merchandise owned by the business may not necessarily be in the warehouse. They may be in transit.

The legal title to the merchandise in transit on the inventory date is known by examining purchase and sales invoices of the last few days of the current accounting period and the first few days of the following accounting period. This legal title depends on shipping terms (agreements).

There are two main types of shipping terms. FOB shipping point and FOB destination

(1) ***FOB shipping poin****t*- the ownership title passes too the buyer when the goods are shipped (when the goods are loaded on the means of transportation, i.e. at the seller's point). The purchaser is responsible for freight charges.
(2) ***FOB destination*** – the title passes to the buyer when the goods arrive at their destination, i.e. at the buyer's point.

So, in general, goods in transit purchased on FOB shipping point terms are included in the inventories of the buyer and excluded from the inventories of the buyer and excluded from the inventories of the seller. And goods in transit purchased on FOB destination terms are included in the inventories of the seller and excluded from the inventories of the buyer.

There are also a problem with goods on consignment at the time of taking and inventory. Goods on consignment to another party (agent) called the consignee. A Consignee is to sell the goods for the owner usually on commission are included in the consignor's inventories and excluded from the consignee's inventories.

1.6. DETERMINING THE COST OF INVENTORY

Costs included in merchandise inventory are those expenditures necessary, directly or indirectly, to bring an item to a salable condition and location. In other words, cost of an inventory item includes its invoice price minus any discount, plus any added or incidental costs necessary to put it in a place and condition for sale. Added or incidental costs can include import duties, transportation-in, storage, insurance against losses while the goods are in transit, and costs incurred in an aging process(for example, aging of wine and cheese).

Minor costs that are difficult to allocate to specific inventory items may be excluded from inventory cost and treated as operating expenses of the period. This is based on materiality principle or the cost-to –benefit constraint.

1.7 INVENTORY COSTING METHODS UNDER PERIODIC INVENTORY SYSTEM

One of the most important decisions in accounting for inventory is determining the per unit costs assigned to inventory items. When all units are purchased at the same unit cost, this process is simple since the same unit cost is applied to determine the cost of goods sold and ending inventory. But when identical items are purchased at different costs, a question arises as to what amounts are included in the cost of merchandise sold and what amounts remain in inventory. A periodic inventory system determines cost of merchandise sold and inventory at the end of the period. We must record cost of merchandise sold and reductions in inventory as sales occur using a perpetual inventory system. How we assign these costs to inventory and cost of merchandise sold affects the reported amounts for both systems.

There are four methods commonly used in assigning costs to inventory and cost of merchandise sold. These are:

- ✎ Specific identification
- ✎ First-in first-out(FIFO)
- ✎ Last-in first-out (LIFO)
- ✎ Weighted average

Let us see these costing methods under ***periodic inventory*** system based on the following illustration

Illustration:

Beza Company began the year and purchased merchandise as follows:

Jan-1	Beginning inventory	80 units@ Br. 60 =	Br. 4,800	
Feb. 16	Purchase	400 units@	56 =	22,400
Sep.2	Purchase	160 units @	50 =	8,000
Nov. 26	Purchase	320 units@	46 =	14,720

Dec. 4	Purchase	240 units	@	40 =	9,600
	Total	1200 units		Br.	59, 520

The ending inventory consists of 300 units, 100 from each of the last three purchases.

1. Specific Identification Method

When each item in inventory can be directly identified with a specific purchase and its invoice, we can use specific identification (also called specific invoice pricing) to assign costs. This method is appropriate when the variety of merchandise carried in stock is small and the volume of sales is relatively small. We can specifically identify the items sold and the items on hand.

Example

From the above illustration, the ending inventory consists of 300 units, 100 from each of the last purchases. So, the items on hand are specifically known from which purchases they are:

Cost of ending inventories under specific identification method

Br. 40 x 100	=	Br. 4,000
Br. 46 x 100	=	4,600
Br. 50 x 100	=	5,000
300units		Br. 13,600

- Cost of Ending inventory cost = Br. 13,600
- The cost of merchandise sold = Cost of goods available for sale - Ending inventory

= Br. 59,520 – Br. 13,600

= Br. 45,920

2 First-in, First-out (FIFO)

This method of assigning cost to inventory and the goods sold assumes inventory items are sold in the order acquired. This means the cost flow is

in the order in which the expenditures were made. So, to determine the cost of ending inventory, we have to start from the most recent purchase and continue to the next recent. Because the first purchased items (old purchases) are the first to be sold they are used (included) in the computation of cost of goods sold.

For example, easily spoiled goods such as fruits, vegetables etc., must be sold near the time of their acquisition. So, the inventory on hand will be from the recent purchases. As an example, consider the previous illustration on page 13.

The cost of ending inventory under FIFO method

= Br. 40 x 240	Br.	9,600
= Br. 46 x 60		2,760
300 units		Br. 12,360

> Cost of Ending inventory Br. 12,360

> Cost of merchandise sold = Br. 59,520 – Br. 12,360

Br. 47,160

3 Last-in first-out (LIFO)

This method of assigning cost assumes that the most recent purchases are sold first. Their costs are charged to cost of goods sold, and the costs of the earliest purchases are assigned to inventory. The cost flow is in the reverse order in which expenditures were made.

In calculating the cost of goods sold, we will start from the earliest purchases.

As an example, take the previous illustration

The cost-ending inventory under FIFO method

=Br.60 x 80 = Br. 4,800

=Br. 56 x 220 = 12,320

300 units

Ending inventory cost = Br. 17,120

Cost of merchandise sold = Br. 59,520 – Br. 17,120

= Br. 42,400

4 Weighted Average Method

This method of assigning cost requires computing the average cost per unit of merchandise available for sale. That means the cost flow is an average of the expenditures.

To calculate the cost of ending inventory, we will calculate first the cost per unit of goods available for sale

$$\textit{Average cost per unit} = \frac{\textit{Cost of goods available for sale}}{\textit{Total units available for sale}}$$

Then the weighted average unit cost is multiplied by units on hand at the end of the period to calculate the cost of ending inventory. Also, the same average unit cost is applied in the computation of cost of goods sold.

As an example, take the previous illustration

Weighted average unit cost = Br. $\frac{59,520}{1,200}$ = Br. 49.60

- Ending inventory cost = Br. 49.60x 300
  = Br. 14,880
- Cost of merchandise sold = Br. 59,520-Br. 14,880
  = Br. 44,640

COMPARISON OF INVENTORY COSTING METHODS

If the cost of units and prices at which they are sold remains stable, all the four methods yield the same results. But if prices change, the three methods usually yield different amounts for:

- Ending inventory
- Cost of merchandise sold
- Gross profit or net income

In periods of rising (increasing) prices: (or if there is inflationary trend):

FIFO yields – higher ending inventory

_ Lower cost of merchandise sold

_ Higher gross profit (net income)

LIFO yields _ Lower ending inventory

_ Higher cost of merchandise sold

_ Lower gross profit (net income)

> Weighted average yields the results between the two.

In periods of declining (decreasing) prices:

FIFO yields _ Lower ending inventory

_ Higher cost of merchandise sold

_ Lower gross profit or net income

LIFO yields_ higher ending inventory

_ Lower cost of merchandise sold

_ Higher gross profit or net income

> Weighted average- between the two

1.8 INVENTORY COSTING METHODS UNDER PERPETUAL INVENTORY SYSTEM

Under perpetual inventory systems we will apply the inventory costing methods each time sale of merchandise is made. We calculate the cost of goods (merchandise) sold and inventory on hand at the time of each sale.

This means the merchandise inventory account is continually updated to reflect purchase and sales.

Illustration:

The beginning inventory, purchases and sales of Nesru Company for the month of January fare as follows:

		Units	***Cost***
Jan. 1	Inventory	12	Br. 10.00
6	Sale	5	
10	purchase	10	Br. 12.00
20	Sale	8	
25	purchase	8	Br. 12.50
27	Sale	10	
30	purchase	15	Br. 14.00

1 First-in first-out Method

The assignment of costs to goods sold and inventory using FIFO is the same for both the perpetual and periodic inventory systems. Because each withdrawal of goods is from the oldest stock on hand. The oldest is the same whether we use periodic inventory system or perpetual inventory system. Let us calculate the cost of goods sold and ending inventory under perpetual inventory system from the above illustration.

Perpetual - FIFO

Date	**Purchase**			**Cost of merchandise sold**			**Inventory**		
	Qty.	**Unit cost**	**Total cost**	**Qty**	**Unit cost**	**Total cost**	**Qty**	**Unit cost**	**Total cost**
Jan. 1							15	Br. 10.00	Br. 150.00
6				5	Br. 10.00	Br. 50.00	10	10.00	100.00

10	10	Br. 12.00	Br.120.00				10 10	10.00 12.00	100.00 120.00
20				8	10.00	80.00	2 10	10.00 12.00	20.00 120.00
25	8	12.50	100.00				2 10 8	10.00 12.00 12.50	20.00 120.00 100.00
27				2 8	10.00 12.00	20.00 96.00	2 8	12.00 12.50	24.00 100.00
30	15	14.00	210.00				2 8 15	12.00 12.50 14.00	24.00 100.00 210.00
				23		Br. 246.00	25		Br. 334.00

So, the cost of merchandise sold and ending inventory under perpetual-FIFO method are Br. 246 and Br. 334 respectively.

Let us see them under periodic - FIFO method:

Units on hand = units available for sale – units sold

= (15 + 10 + 8 + 15) – (5+ 8 + 10)

= 48 - 23 = 25

Cost of ending inventory = Br. 14 x 15 = Br. 210
Br. 12.50 x 8 = 100
Br. 12 x 2 = 24
Br. 334

Cost of goods available for sale = Br. 120 + Br. 100 + Br. 210 = Br. 580
Cost of goods sold = Br. 580 – Br. 334
Br 246

So, the same results of cost of gods sold and ending inventory under both periodic inventory systems.

2 Lasting, First-Out method

Unlike FIFO method, different results may occur under periodic and perpetual inventory system. The most recent purchases change when new purchase occurs.

Let us calculate first the cost of goods sold and ending inventory for the above illustration under perpetual inventory system. Then, we will see the results under periodic inventory system.

Perpetual - LIFO

Date	Purchase			Cost of merch. Sold			Inventory		
	Qty	Unit cost	Total cost	Qty	Unit cost	Total cost	Qty	Unit cost	Total cost
Jan. 1							15	Br. 10.00	Br. 150.00
6				5	Br. 10.00	Br. 50.00	10	10.00	100.00
10	10	Br.	Br.				10	10.00	100.00

		12.00	120.00				10	12.00	120.00
20				8	Br. 12.00	Br. 96.00	10 2	10.00 12.00	100.00 24.00
25	8	12.50	100.00				10 2 8	10.00 12.00 12.50	100.00 24.00 100.00
27				8 2	12.50 12.00	100.00 24.00	10	10.00	100.00
30	15	14.00	210.00				10 15	10.00 24.00	100.00 210.00
				23		Br. 270.00	25		Br. 310.00

So, the cost of merchandise sold and ending inventory under perpetual inventory system are Br. 270 and Br. 310 respectively.

The results under periodic inventory system are:

Cost of ending inventory = Br. 10 x 15 = Br. 150

Br. 12 x $\frac{10}{25}$ = $\frac{120}{}$

Br. $\underline{\underline{270}}$

Cost of merchandise sold = Br. 580 - 270

= $\underline{\underline{\text{Br. 310}}}$

As you see, the results are different under periodic & perpetual inventory systems.

3 Weighted average cost method.

Under this method, the average unit cost is calculated each time purchased is made to be applied on the sales made after the purchases. The results may be different under periodic and perpetual inventory system.

Let us calculate the cost of merchandise sold and ending inventory comes out from the previous illustration under perpetual inventory system.

Average Cost Method (Moving Average)

Date	Purchase			Cost of merchandise sold			Inventory		
	Qty	**Unit cost**	**Total cost**	**Qty**	**Unit cost**	**Total cost**	**Qty**	**Unit cost**	**Total cost**
Jan. 1							15	Br. 10.00	Br. 150.00
6				5	Br. 10.00	Br. 50.00	10	10.00	100.00
10	10	12.00	Br. 120.00				20	11.00 = $\frac{100+120}{10+10}$	220.00
20				8	11.00	88.00	12	11.00	132.00
25	8	12.00	100.00				20	11.60 + $\frac{132+100}{12+8}$	232.00
27				10	11.60	116.00	10	11.60	116.00
30	15	14.00	210.00				15	13.04 $\frac{116+210}{10+15}$	326.00
				23		Br. 254.00	25	Br. 13.04	Br 326.00

So, the cost of goods sold and ending inventory under perpetual inventory system are Br. 254.00 and Br. 326.00, respectively.

The results under periodic inventory system are:

Weighted average unit cost = $\frac{\text{Br. 580}}{}$ = Br. 12.08

Ending inventory cost = Br. 12.08 x 25

= Br. 302

Cost of merchandise sold = Br. 580 – Br. 302

= Br. 278

So, the result is different under periodic and perpetual inventory systems.

1.9. ADDITIONAL VALUATION PROBLEMS FOR INVENTORIES

1.9.1 VALUATION AT LOWER OF COST OR MARKET (LCM)

It was explained how costs are assigned to ending inventory and cost of goods sold using one of four costing methods (FIFO, LIFO, Weighted average, or specific identification). Yet, the cost of inventory is not necessarily the amount always reported on a balance sheet. Accounting principles require that inventory be reported at the market value of replacing inventory when market is lower than cost. Merchandise inventory is then said to be reported on the balance sheet at the lower of cost or market (LCM).

In applying LCM, cost is the acquisition price of inventory computed using one of the historical cost methods - specific identification, FIFO, LIFO, and Weighted average; market is defined as the current market value (cost) of replacing inventory. It is the current cost of purchasing the same inventory items in the usual manner. It is important to know that market is not defined as the sales prices. A decline in market cost reflects a loss of value in inventory. This is because the recorded cost of inventory is higher than the current market cost. When this occurs, a loss is recognized. This is done by recognizing the decline in merchandise inventory from recorded cost to market cost at the end of the period.

LCM is applied in one of three ways:

(1) *Separately to individual item*
(2) *To major categories of items*

(3) *To the whole of inventory*

The less similar the items are that make up inventory, the more likely it is that companies apply LCM to individual items. Advances in technology further encourage the individual item application.

Illustration

The following are the inventory of ABC motor sports, retailer.

Inventory Items	***units on hand***	***per unit cost***	***market***
Cycles:			
Roadster	*50*	*Br. 15,000*	*Br. 14,000*
Sprint	*20*	*9,000*	*9,500*
Off Road:			
Trax-4	*10*	*10,000*	*11,200*
Blaz'm	*6*	*16,000*	*14,500*

Let us see LCM computation under the three ways:

(1) **Separately to each individual item**

Inventory items	***Total cost***	***Total market***	***LCM***
Roadster	Br. 750,000	Br. 700,000	Br. 700,000
Sprint	180,000	190,000	180,000
Categories sub total	Br. 930,000	Br. 890,000	
Trax-4	100,000	112,000	100,000
Blaz'm	96,000	87,000	87,000
Categories sub total	Br. 196,000	Br. 199,000	

Totals	Br.1,126,000	Br. 1,089,000	Br. 1,1,067,000

(2) **Major categories of items**

Inventory categories	***Categories total cost***	***Categories total market***	***LCM***
Cycles	Br. 930,000	Br. 890,000	Br. 890,000
Off. Road	196,000	199,000	199,000
Totals	Br. 1,126,000	Br. 1089,000	Br. 1,086,000

When LCM is applied to the whole of inventory, the market cost is Br. 1,089,000. Since this market cost is Br. 37,000 lower than Br. 1,126,000 recorded cost, it is the amount reported for inventory on the balance sheet. When LCM is applied to individual items of inventory, the marked cost is Br. 1,067,000. Since market is again less than Br. 1,126,000 cost, it is the amount reported for inventory. When LCM is applied to the major categories of inventories, the market is Br. 1,086,000 which is also lower than cost.

1.9.2. ESTIMATING INVENTORY COST

In practice, an inventory amount is estimated for some purposes. When it is impossible to take a physical inventory or to maintain perpetual inventory records.

Example

1) Monthly income statements are needed. It may b e too costly, to take physical inventory. This is especially the case when periodic inventory system is used.

2) When a catastrophe such as a five has destroyed the inventory. In such case, to ask claims from insurance companies, the is a need of estimated inventory.

To estimate the cost of inventory, two methods are used. These are retail method and gross profit method.

1 Retail method of inventory costing

This method is mostly used by retail business. The estimate is made based on the relation ship between the cost and the retail price of merchandise available for sale.

The steps to be followed are:

(1) Calculate the cost to retail ratio = $\frac{\text{Cost of merchandise available for sale}}{\text{Retail Price of merchandise available for sale}}$

(2) Calculate the ending inventory at retail price

Ending inventory at retail price = retail price of merchandise available for sale – ***Sales***

(3) Calculate the estimated cost of ending inventory

Estimated cost of ending inventory = Cost to retail ration X ***Ending inventory at retail***

Example

	Cost	**Retail**
Sep. 1, beginning inventory	Br. 25,000	Br. 40,000
Purchases in September (net)	125,000	160,000
Sales in September (net)		140,000

(1) Cost retail ration = $\frac{\text{Br. 25,000 + Br. 125,000}}{\text{Br. 40,000 + Br. 160,000}}$ = 0.75

(2) Ending inventory at retail = (Br. 40,000 + Br. 160,000) – Br. 140,000 = Br. 60,000

(3) Estimated ending inventory at cost = 0.75 X Br. 60,000

= Br. 45,000

2 Gross profit method

This method uses an estimate of the gross profit realized during the period to estimate the cost of inventory. The gross profit rate may be estimated based on the average of previous period's gross profit rates.

The steps are as follows:

(1) The gross profit rate is estimated and then estimated gross profit is calculated.

Estimated gross profit = Gross profit rate X Sales

(2) Cost of merchandise sold is estimated

Estimated cost of merchandise sold = Sales - Estimated gross profit

(3) Calculate the estimated cost of ending inventory

Estimated cost of ending inventory =

Cost of merchandise available for sale – Estimated cost of merchandise sold.

Example

Oct. 1, beginning inventory (cost) –	Br. 36,000
Net purchases during October (cost)	204,000
Net sales during October	220,000

Estimated gross profit rate is 40%

The ending inventory is estimated as follows:

(1) Estimated gross profit = 0.4 X 220,000

= Br. 88,000

(2) Estimated cost of merchandise sold

= Br. 220,000 – Br. 88,000

= Br. 132,000

(3) Estimated cost of ending inventory

= (Br. 36,000 + 204,000) – Br. 132,000

= Br. 240,000 – Br. 132,000

= Br. 108,000