



Chapter 3

MATERIAL

ACCOUNTS – 2

Introduction

- Whenever materials or goods are purchased, the firm knows the exact price of goods received on the basis of the inward invoices. There the question of making any estimate or guess work about the price does not arise. But when the materials purchased and stored are issued for production or are sold, the question of determining the price of materials issued arises.
- It is not easy to do so. There are various methods used for this purpose. E.g., Under FIFO method, it is assumed that the goods received first are issued first to production and it is priced at the price at which the first lot was purchased. If however, the specific materials purchased are separately stored, they are priced at the actual price of materials, when issued.
- But generally goods purchased at different prices in different lots are kept together. Hence, materials purchased from different lots cannot be separately identified. In such circumstances, it is difficult to determine the prices of materials issued. For this purpose various methods of pricing are used, which are described below.

Methods of stock valuation

- Specific Cost Method
- Identifiable Cost Method
- **First In First Out – FIFO Method**
- **Last In First Out – LIFO Method**
- Average Cost Method:
 - Simple Average Method
 - **Weighted Average Method**
 - Periodic Simple Average Method
 - Periodic Weighted Average Method
- Fixed Price Method
- Standard Price Method
- Inflated Price Method
- Replacement Price Method
- Cost Price or Market Price whichever is lower
- Highest In First Out (HIFO) Method

First In First Out – FIFO Method

- It is assumed under this method that the materials are issued in the order in which they are received. It is immaterial whether the actual physical stock is issued or not in that order. But the pricing of issues is made on that assumption.
- For example, (1) 100 kgs. of materials were purchased at ₹ 25 per kg. on 1st Jan. and 120 kgs. at ₹ 24 on 20th Jan. On 25th January 75 kgs. are issued to production. Here, the issues will be from the first lot of 100 kgs. and will be priced at ₹ 25 per kg. Now there will be a stock of 25 kgs. at ₹ 25 and 120 kgs. at ₹ 24. Suppose, on 29th January again 40 kgs. are issued to production. Here, first 25 kgs. will be issued from the first lot at ₹ 25 per kg. When it is exhausted, the remaining 15 kgs. will be assumed to be issued from the second lot and will be priced at ₹ 24 per kg. If no further issues are made, then on 31st January the stock will be 105 kgs. from the second lot and will be priced at ₹ 24 per kg.

Advantages of FIFO Method

- The main advantage of this method is that the materials are charged at actual cost. No adjustment of profit or loss on account of selecting arbitrary price is needed.
- Secondly, the value of inventory would be nearer the current market price, as the value of stock is based on the price of latest purchases.
- The rule that perishable items must be sold in the order in which they are purchased, is observed.

Disadvantages of FIFO Method

- The method involves complicated calculations and entails much clerical work.
- The application of the system may prove unjust during falling prices in the sense that one job started a little later may be charged at lower price and the other job started little earlier may be charged at higher price because the materials from the earlier lot may have been exhausted. Thus two jobs using materials of the same nature are charged different prices.
- In times of rising prices, the materials are charged at lower price as they are issued from earlier issues and the cost of production would be lower. Reverse would be the case in the period of falling prices.

1. The following are the transactions receipts and issues of an item of raw material :

2011			Units	Price per unit Rs.
March	1	: Purchases	600	1.50
"	4	: Purchases	1,200	2.00
"	6	: Issued	1,000	—
"	10	: Purchases	1,400	2.00
"	15	: Issued	1,600	—
"	20	: Purchases	600	2.50
"	23	: Issued	200	—

Ascertain the quantity of closing stock as on March 31 and state what will be its value in each case, if the issues are made under the following methods :

(1) First in First out.

• **Solution:**

Stock Register (FIFO Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
Mar. 1	--	600	1.50	900	--	--	--	--	600	1.50	900
4	--	1200	2.00	2400	--	--	--	--	{ 600 1200	{ 1.50 2.00	{ 900 2400
6	--	--	--	--	--	{ 600 1000	{ 1.50 2.00	{ 900 800	--	--	--
10	--	1400	2.00	2800	--	--	--	--	{ 800 1400	{ 2.00 2.00	{ 1600 2800
15	--	--	--	--	--	{ 800 1600	{ 2.00 2.00	{ 1600 1600	--	--	--
20	--	600	2.50	1500	--	--	--	--	{ 600 600	{ 2.00 2.50	{ 1200 1500
23	--	--	--	--	--	200	2.00	400	{ 400 600	{ 2.00 2.50	{ 800 1500
Total	--	3800	--	7600	--	2800	--	5300	1000	--	2300

3. The following is a summary of one basic raw-material item used in a chemical product. The following data relate to the month of March, 2011 :

- 1-3-'11 Opening balance 100 kgs. @ Rs. 4-90 per kg.
- 4-3-'11 Received 50 kgs. @ Rs. 5 per kg.
- 10-3-'11 Issued 50 kgs.
- 15-3-'11 Materials from the above issue returned from the process 10 kgs.
- 20-3-'11 Received 100 kgs. @ Rs. 5.20 per kg.
- 25-3-'11 Issued 150 kgs.
- 28-3-'11 Received 80 kgs. @ Rs. 5.25 per kg.

On 31st March, 2011 the stock verifier detected a shortage of 5 kgs.

Prepare a Stock Register under FIFO Method and find the value of closing stock on 31-3-'11.

• **Solution:**

Stock Register (FIFO Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
Mar. 1	Opening	100	4.90	490	--	--	--	--	100	4.90	490
4	--	50	5.00	250	--	--	--	--	{ 100	4.90	490
									{ 50	5.00	250
10	--	--	--	--	--	50	4.90	245	{ 50	4.90	245
									{ 50	5.00	250
15	Returned	10	4.90	49	--	--	--	--	{ 60	4.90	294
									{ 50	5.00	250
20	--	100	5.20	520	--	--	--	--	{ 60	4.90	294
									{ 50	5.00	250
									{ 100	5.20	520
25	--	--	--	--	--	{ 60	4.90	294	--	--	--
						{ 50	5.00	250	--	--	--
						150 { 40	5.20	208	60	5.20	312
28	--	80	5.25	420	--	--	--	--	{ 60	5.20	312
									{ 80	5.25	420
31	--	--	--	--	Shortage	5	5.20	26	{ 55	5.20	286
									{ 80	5.25	420
Total	--	340	--	1729	--	205	--	1023	135	--	706

Last In First Out – LIFO Method

- The assumption under this method is that the materials purchased last are issued first. The materials are charged at price of last purchase and then at prices previous purchase and so on. The method is quite the reverse of the FIFO method.
- Suppose, 100 kgs. are purchased at ₹ 25 on 1st Jan., 2011 and 120 kgs. on 20th January are purchased at ₹ 24 per kg. If 75 kgs. are issued to production on 25th January, then it would be charged at ₹ 24 per kg. i.e., the price at which the last purchase was made, because issues are priced on the assumption that last purchased goods are issued first.
- Now on 25th January, after issuing goods, the stock will be of 100 kgs. at ₹ 25 and 45 kgs. at ₹ 24. Now, if on 29th January 50 kgs. are issued then 45 kgs. will be issued from the second lot at ₹ 24 and the remaining 5 kgs. will be issued from the first lot at ₹ 25. Now, the closing stock will be 95 kgs. at ₹ 25 (₹ 2,250).

Advantages of LIFO Method

- As the materials are charged at latest price, the cost of production would reflect the current market price and is more reliable for fixing selling price.
- The principle of charging materials at actual cost is retained.
- In actual condition, the material last purchased is put above the earlier purchases. It is therefore, natural that the goods stored above will be taken out first.

Disadvantages of LIFO Method

- It involves complicated calculations and increases the possibility of clerical errors.
- Secondly the inventory valuation is made at old rates and consequently the value of closing stock fails to reflect correct value.
- It is not useful for perishable items.
- There will be difference in the prices of goods issued to two different jobs, within a short interval.

1. The following are the transactions receipts and issues of an item of raw material :

2011			Units	Price per unit Rs.
March	1	: Purchases	600	1.50
"	4	: Purchases	1,200	2.00
"	6	: Issued	1,000	—
"	10	: Purchases	1,400	2.00
"	15	: Issued	1,600	—
"	20	: Purchases	600	2.50
"	23	: Issued	200	—

Ascertain the quantity of closing stock as on March 31 and slate what will be its value in each case, if the issues are made under the following methods :

(2) Last in, First out.

• **Solution:**

Stock Register (LIFO Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
Mar. 1	--	600	1.50	900	--	--	--	--	600	1.50	900
4	--	1200	2.00	2400	--	--	--	--	{ 600 1.50 900 } { 1200 2.00 2400 }		
6	--	--	--	--	--	1000	2.00	2000		600 1.50 900	
10	--	1400	2.00	2800	--	--	--	--	200 2.00 400		
									600 1.50 900		
									200 2.00 400		
									1400 2.00 2800		
15	--	--	--	--	--	{ 1400 2.00 2800 } { 200 2.00 400 }			--	--	--
							1600			600 1.50 900	
20	--	600	2.50	1500	--	--	--	--	600 1.50 900		
									600 2.50 1500		
23	--	--	--	--	--	200	2.50	500	600 1.50 900		
									400 2.50 1000		
Total	--	3800	--	7600	--	2800	--	5700	1000	--	1900

4. The following is the record of receipts and issues of a certain material in the factory during July, 2011 :

2011

July	1	Opening Balance	100	tons at Rs. 10 per ton
"	3	Issued	60	"
"	7	Received	120	" at Rs. 10.10 per ton
"	15	Issued	50	"
(Stock verification reveals loss of 2 tons)				
"	19	Received back from order	20	(Previously issued at Rs. 9.90 per ton)
"	22	Issued	80	"
"	25	Received	44	" at Rs. 10.20 per ton
"	30	Issued	66	"

Prepare Stock Register, assuming that issues are priced on (i) FIFO and (ii) LIFO method.

• **Solution:**

Stock Register (FIFO Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
July 1	Opening	100	10.00	1000	--	--	--	--	100	10.00	1000
3	--	--	--	--	--	60	10.00	600	40	10.00	400
7	--	120	10.10	1212	--	--	--	--	{ 40 10.00 400 } { 120 10.10 1212 }		
15	--	--	--	--	--	{ 40 10.00 400 } 50 { 10 10.10 101 }				--	--
15	--	--	--	--	Shortage		2	10.10	20.2	110	10.10
19	Returned	20	9.90	198	--	--	--	--	{ 108 10.10 1090.8 } { 20 9.90 198 }		
22	--	--	--	--	--	80	10.10	808		108	10.10
25	--	44	10.20	448.8	--	--	--	--	{ 28 10.10 282.8 } { 20 9.90 198 }		
30	--	--	--	--	--	{ 28 10.10 282.8 } { 20 9.90 198 }				28	10.10
							66 { 18 10.20 183.6 }			20	9.90
									44	10.20	448.8
									26	10.20	265.2
Total	--	284	--	2858.8	--	258	--	2593.6	26	--	265.2

Stock Register (LIFO Method)

Date	Receipts				Issues				Balance			
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.	
2011												
July 1	Opening	100	10.00	1000	--	--	--	--	100	10.00	1000	
3	--	--	--	--	--	60	10.00	600	40	10.00	400	
7	--	120	10.10	1212	--	--	--	--	40	10.00	400	
										120	10.10	1212
15	--	--	--	--	--	50	10.10	505	40	10.00	400	
									70	10.10	707	
15	--	--	--	--	Shortage	2	10.10	20.2	40	10.00	400	
									68	10.10	686.8	
19	Returned	20	9.90	198	--	--	--	--	40	10.00	400	
									68	10.10	686.8	
									20	9.90	198	
22	--	--	--	--	--	80	20	9.90	198	40	10.00	400
							60	10.10	606	8	10.10	80.8
25	--	44	10.20	448.8	--	--	--	--	40	10.00	400	
									8	10.10	80.8	
									44	10.20	448.8	
30	--	--	--	--	--	66	44	10.20	448.8	--	--	--
							8	10.10	80.8	--	--	--
							14	10.00	140.0	26	10.00	260
Total	--	284	--	2858.8	--	258	--	2598.8	26	--	260	

Weighted Average Method

- In order to eliminate the effects of price fluctuations, an average price method is used. The assumption is that once the goods are purchased and are received in stores, they lose their identity. There are two types of average, viz. (a) Simple average and (b) weighted average.
- (a) Simple average is the average of prices at which various lots of materials are purchased, without taking into account the quantity purchased. E.g., one lot of 200 kgs. material A is purchased at ₹ 15 per kg. and 600 kgs. are purchased at ₹ 16 per kg. then the simple average will be $\text{₹ } 15 + \text{₹ } 16 = 31 \div 2 = \text{₹ } 15.50$ per kg. Thus simple average is obtained by adding up prices and dividing the total by the number of prices so added. This method is defective, as it ignores the quantities purchased in each lot. Secondly, as the prices charged are not at actual cost, the profit or loss may arise in the stores ledger account.

Weighted Average Method_(cont.)

- (b) Weighted average method is more practical, as it gives due weightage to the quantities purchased. It is obtained by dividing the total value of stock by the total quantity. The average will have to be calculated afresh, every time fresh supply arrives. The formula used will be $\frac{\sum WX}{\sum W}$ where, W = weight and X = price.
- Suppose, 200 kgs. are purchased on 5-2-'08 at ₹ 15 per kg. and 600 kgs. on 8-2-'08 at ₹ 16 per kg. then the weighted average price will be calculated as under:

$$\frac{(200 \times 15) + (600 \times 16)}{200 + 600} = \frac{3000 + 9600}{800} = \frac{12,600}{800} = ₹ 15.75$$

- This can be calculated with the help of another formula:

$$\text{Weighted average} = \frac{p_1 q_1 + p_2 q_2}{q_1 + q_2}$$

Advantages of Weighted Average Method

- As both the quantity and value are taken into consideration, the value of goods issued will be reasonable.
- If there are wide or frequent fluctuation in prices, then its effects will be reduced under this method, because average price reduces the effect of differences in prices.
- Under LIFO and FIFO methods in the same issue-certain goods are charged at one price and certain other goods are charged at different prices. Whereas in Weighted Average Method, the same issue of goods are priced at one price only.
- This method is also approved by the International Accounting Standard Committee.

Disadvantages of Weighted Average Method

- If there are frequent purchases, then this method is not usually adopted because it involves calculation of average at each purchase of goods. Thus the work of calculation of average increases and large number of calculations are involved.

5. The following transactions are recorded in respect of materials used by a company manufacturing cosmetics :

Date	Quantity received Units	Rate per unit Rs.	Quantity issued Units
3-12-2011	400	2.10	—
15-12-2011	500	2.20	—
20-12-2011	—	—	500
26-12-2011	600	2.50	—
28-12-2011	—	—	900

Prepare Stock Register assuming that the issues are priced by **weighted average method**.

• **Solution:**

Stock Register (Weighted Average Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2020											
Dec. 3	--	400	2.10	840	--	--	--	--	400	2.10	840
15	--	500	2.20	1100	--	--	--	--	900	2.16	1940
20	--	--	--	--	--	500	2.16	1080	400	2.15	860
26	--	600	2.50	1500	--	--	--	--	1000	2.36	2360
28	--	--	--	--	--	900	2.36	2124	100	2.36	236
Total	--	1500	--	3440	--	1400	--	3204	100	--	236

Working Note: Weighted Average of Balances.

$$(1) \text{ 15-12-2011} = \frac{(400 \times 2.10) + (500 \times 2.20)}{400 + 500} = \frac{840 + 1100}{900} = \frac{1940}{900} = ₹ 2.16$$

$$(2) \text{ 26-12-2011} = \frac{(400 \times 2.15) + (600 \times 2.50)}{400 + 600} = \frac{860 + 1500}{1000} = \frac{2360}{1000} = ₹ 2.36$$

6. From the following information, prepare a Stock Register adopting the “Weighted Average” method of pricing out issues :

2011

- | | | |
|-------------|-----------|---|
| Aug. | 1 | Opening balance : 50 units @ Rs. 3 per unit |
| | 5 | Issued out to production : 20 units |
| | 7 | Purchased 48 units @ Rs. 4 per unit |
| | 9 | Issued out to production : 20 units |
| | 19 | Purchased 56 units @ Rs. 3 per unit |
| | 24 | Received back into stores 9 units out of 20 units issued on 9th August, 2011 |
| | 27 | Issued out to production : 20 units |

• **Solution:**

Stock Register (Weighted Average Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
Aug. 1	Opening	50	3.00	150	--	--	--	--	50	3.00	150
5	--	--	--	--	--	20	3.00	60	30	3.00	90
7	--	48	4.00	192	--	--	--	--	78	3.62	282
9	--	--	--	--	--	20	3.62	72.4	58	3.62	209.6
19	--	56	3.00	168	--	--	--	--	114	3.31	377.6
24	Return	9	3.62	32.6	--	--	--	--	123	3.34	410.2
27	--	--	--	--	--	20	3.34	66.8	103	3.34	343.4
Total	--	163	--	542.6	--	60	--	199.2	103	--	343.4

Working Note: Weighted Average of Balances. (1) 7-8-2011 = $\frac{90+192}{30+48} = \frac{282}{78} = ₹ 3.62$

(2) 19-8-2011 = $\frac{209.6+168}{58+56} = \frac{377.6}{114} = ₹ 3.31$

(3) 24-8-2011 = $\frac{377.6+32.6}{114+9} = \frac{410.2}{123} = ₹ 3.34$

7. The following are the transactions of the material used by one company :

Date	Receipts Quantity in Units	Rate per Unit	Issues Quantity in Units
		Rs. P's	
4-12-2011	200	4.20	—
16-12-2011	250	4.56	—
21-12-2011	—	—	250
27-12-2011	300	5.00	—
29-12-2011	—	—	400

Prepare the Stock-Register, assuming that pricing of the issues is done by Weighted Average Method.

• **Solution:**

Stock Register (Weighted Average Method)

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
Dec. 4	--	200	4.20	840	--	--	--	--	200	4.20	840
16	--	250	4.56	1140	--	--	--	--	450	4.40	1980
21	--	--	--	--	--	250	4.40	1100	200	4.40	880
27	--	300	5.00	1500	--	--	--	--	500	4.76	2380
29	--	--	--	--	--	400	4.76	1904	100	4.76	476
Total	--	750	--	3480	--	650	--	3004	100	--	476

Working Note: Weighted Average of Balances.

$$(1) 16-12-2011 = \frac{840+1140}{200+250} = \frac{1980}{450} = ₹ 4.40$$

$$(2) 27-12-2011 = \frac{880+1500}{200+300} = \frac{2380}{500} = ₹ 4.76$$

10 The following is a summary of receipts and issues of Material Z in a factory during January, 2008.

Date	Receipts		Issues	
	Units	Rate per Unit Rs.	Date	Units
1-1-08	90	4	12-1-08	150
5-1-08	180	6	20-1-08	240
14-1-08	210	6	29-1-08	30
25-1-08	90	8		

The issue on 12-1-08 and 20-1-08 are priced on LIFO and FIFO basis respectively. It was decided to price the issues of 25-1-08 on Weighted Average Method.

Prepare Stock Register for material.

• **Solution:**

Stock Register

Date	Receipts				Issues				Balance			
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.	
2008												
Jan. 1	--	90	4.00	360	--	--	--	--	90	4.00	360	
5	--	180	6.00	1080	--	--	--	--	90	4.00	360	
12	--	--	--	--	--	150	6.00	900	90	4.00	360	
14	--	210	6.00	1260	--	--	--	--	90	4.00	360	
									30	6.00	180	
									210	6.00	1260	
20	--	--	--	--	--	240	90	4.00	360	--	--	--
							30	6.00	180	--	--	--
							120	6.00	720	90	6.00	540
25	--	90	8.00	720	--	--	--	--	180	7.00	1260	
29	--	--	--	--	--	30	7.00	210	150	7.00	1050	
Total	--	570	--	3420	--	420	--	2370	150	--	1050	

11 The following is a summary of receipts and issues of Material 'B' in a factory during March, 2010 :

Date	Particulars	Quantity (Kg.)	Total Amount Rs.
1-3-'10	Opening Balance	250	5,000
5-3-'10	Purchased	1,750	31,500
8-3-'10	Purchased	1,000	22,000
13-3-'10	Issued	1,200	—
15-3-'10	Purchased	200	5,000
19-3-'10	Issued	1,000	—
20-3-'10	Purchased	1,000	15,200
25-3-'10	Issued	1,500	—

The material issued on 13-3-'10 and 18-3-'10 were priced on 'FIFO' and LIFO basis respectively. It was decided to price the issues by "Weighted Average Method" from 20-3-'10.

• **Solution:**

Stock Register

Date	Receipts				Issues				Balance			
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.	
2010												
Mar. 1	Opening	250	20.00	5000	--	--	--	--	250	20.00	5000	
5	--	1750	18.00	31500	--	--	--	--	250	20.00	5000	
8	--	1000	22.00	22000	--	--	--	--	1750	18.00	31500	
13	--	--	--	--	--	1200	250	20.00	5000	250	20.00	5000
							950	18.00	17100	800	18.00	14400
15	--	200	25.00	5000	--	--	--	--	1000	22.00	22000	
19	--	--	--	--	--	1000	200	25.00	5000	800	18.00	14400
							800	22.00	17600	200	22.00	4400
20	--	1000	15.20	15200	--	--	--	--	2000	17.00	34000	
25	--	--	--	--	--	1500	17.00	25500	500	17.00	8500	
Total	--	4200	--	78700	--	3700	--	70200	500	--	8500	

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The transactions of Material A in Shyam Ltd :

July, 2011	Transactions	Units	Total Amt. Rs.
1	Purchase	250	750
8	Purchase	250	1,000
13	Issued	200	FIFO
15	Purchase	500	2,500
21	Issued	300	LIFO
23	Purchase	300	1,500
30	Issued	400	WEIGHTED AVG.

Prepare Store Ledger for the month of July.

• **Solution:**

Stock Register

Date	Receipts				Issues				Balance		
	Inward Inv. No.	Qty.	Rate	Amt.	Outward Inv. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
2011											
July 1	--	250	3.00	750	--	--	--	--	250	3.00	750
8	--	250	4.00	1000	--	--	--	--	250	3.00	750
13	--	--	--	--	--	200	3.00	600	50	3.00	150
15	--	500	5.00	2500	--	--	--	--	250	4.00	1000
21	--	--	--	--	--	300	5.00	1500	50	3.00	150
23	--	300	5.00	1500	--	--	--	--	250	4.00	1000
30	--	--	--	--	--	400	4.5625	1825	200	5.00	1000
Total	--	1300	--	5750	--	900	--	3925	400	--	1825