



Workbook



Cost Accounting

ZAHEER SWATI



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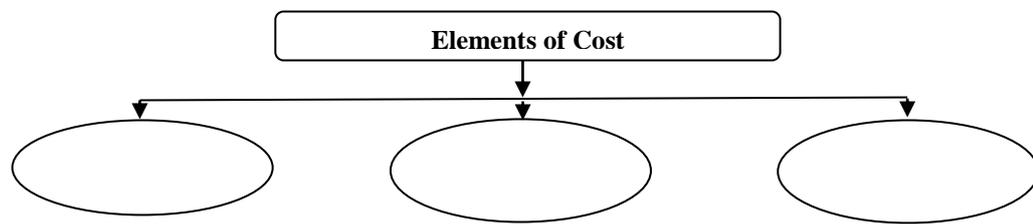
COSTING CONCEPTS

1.1 Cost and Expense

- Costs can be defined as money paid or spent to acquire an asset. It is mainly a one-time payment that is capitalized and reflected on a balance sheet. Cost is sacrifice of economic resources for example purchase of machinery etc.
- Expense is expired cost that charged against revenue in particular accounting period say depreciation, rent etc.
- The expense is an amount of money that must be spent especially regularly to pay for something. An expense is an ongoing payment, like rent, depreciation, salaries, and marketing.
- The difference between cost and expense is that cost identifies an expenditure, while expense refers to the consumption of the item acquired.

1.2 Elements of Manufacturing Cost

- Cost of production/manufacturing consists of various expenses incurred on production/manufacturing of goods or services sold.
- These are the elements of cost which can be divided into three groups i.e. Material, Labor and Expenses.



1.2.1 Direct material

- Direct Material is that material which can be easily identified and related with specific product, job, and process
- Timber is a raw material for making furniture, cloth for making garments, sugarcane for making sugar, and Gold/silver for making jewellery, etc. are some examples of direct material

1.2.2 Direct labor

- ❖ Labor which takes active and direct part in the production of a product or providing services
- ❖ Direct labor is that labor which can be easily identified and related with specific product, job and process
- ❖ Direct labor cost is easily traceable to specific products
- ❖ Direct labor varies directly with the volume of output
- ❖ Cost of wages paid to carpenter for making furniture, cost of a tailor in producing readymade garments, cost of washer in dry cleaning unit are some examples of direct labor

1.2.3 Expenses

- ☞ All cost incurred in the production of finished goods other than material cost and labor cost are termed as expenses
- ☞ Expenses are classified into two categories i.e. Direct expenses, and Indirect expenses (Factory Overheads)

1.2.3.1 Direct expenses

- ✚ These are expenses which are directly, easily, and wholly allocated to specific cost center or cost units and charged to direct material section
- ✚ All direct cost other than direct material and direct labor are termed as direct expenses
- ✚ Some examples of the direct expenses are cost of wages, inward carriage and freight, cost of patents, royalties etc.

1.2.3.2 Indirect expenses

- These expenses cannot be directly, easily, and wholly allocated to specific cost center or cost units
- All indirect costs are indirect material, indirect labor and indirect expenses
- Thus, indirect expenses are treated as part of Factory Overheads

1.2.3.2.1 Indirect materials:

- Grease, oil, lubricants etc.
- Small tools, brushes for sweeping, sundry supplies etc.
- Gum, nails, consumable stores
- Factory printing and stationery

1.2.3.2.2 Indirect Labor:

- ✓ Salary of factory manager, foremen, supervisors, clerks etc.
- ✓ Salary of storekeeper, security staff, time keepers
- ✓ Salary and fee of factory directors and technical directors
- ✓ Contribution to pension fund, leave pay etc. of factory employee

1.2.3.2.3 Indirect expenses:

- Rent of factory buildings and land
- Insurance of factory building, plant, and machinery
- Municipal taxes of factory building
- Depreciation of factory building, plant and machinery, and their repairs and maintenance charges
- Power and fuel used in factory
- Factory telephone expenses

Example # 1.1: The following information has been taken from company records. You are required to calculate Direct Material, Direct Labor and Factory Overhead?

Items	Amount
Inventory at the start of year	8,000
Purchases of direct material	5,000
Payment for repair of machinery	3,000
Carriage inward	1,500
Purchase of supplies	6,000
Transportation inward	4,000
Payment to security staff	2,200
Stock at the end of year	2,900
Depreciation of factory machine	1,600
Salaries of Supervisor	1,400
Return to supplier	600
Payment to factory worker	10,000
Factory power	2,300
Wages of operators	7,000
Wages of oilmen	600
Wages of machine cleaners	900
Gum, nails and consumable stores	1,300
Insurance of factory	700

Solution

<i>Direct Material</i>	<i>Amount</i>	<i>Amount</i>
<i>Total</i>		

<i>Direct Labor</i>	<i>Amount</i>
<i>Total</i>	

<i>Factory Overhead</i>	<i>Amount</i>
<i>Total</i>	

1.3 Cost of Sales

- ✓ The term cost of sales use for merchandising or trading business
- ✓ The cost of sales involves the identification of the expenses that are related to the trading process
- ✓ Opening stock plus net purchases (with any direct expense) minus closing stock

Example # 1.2: Test your understanding?

a. Ascertain Cost of Sales from the following figures:

Opening Inventory / Stock	Rs. 3,700
Purchases	20,800
Closing Inventory / Stock	2,500

b. Ascertain Cost of Sales from the following figures:

Opening Stock	Rs. 8,500
Purchases	30,700
Direct Expenses	4,800
Marketing Expenses	5,200
Closing Inventory	9,000

c. Ascertain Purchases from the following figures:

Cost of Sales	Rs. 80,700
Opening Stock	5,800
Closing Stock	6,000

1.4 Gross Profit, Operating Profit and Net Profit

- A company's net revenue minus its cost of goods sold or cost of sales
- Operating profit is gross profit minus commercial expenses of the company
- Net profit is operating profit minus (financial charges, taxes and other expenses) plus other income

1.4 .1 Commercial Expenses

➤ Marketing expenses and administrative expenses are combine called commercial expenses. Following are some examples for commercial expenses

Marketing Expenses

Sales salaries
 Commission to sales staff
 Advertisement
 Entertainment
 Travel expenses
 Freight out and cartage out
 Miscellaneous marketing expense

+

Administrative Expenses

Administrative and office salaries
 Employer payroll taxes
 Rent
 Property tax
 Office Depreciation
 Auditing expenses
 Legal Expenses
 Uncollectable accounts
 Miscellaneous administrative expenses

Example # 1.3: Test your understanding?

a) Calculate Gross Profit from the following figures:

Cost of Goods Sold	Rs. 70,800
Sales	130,200

b) Ascertain Gross Profit from the following figures:

Opening Inventory	Rs. 5,570
Purchases	13,816
Sales	15,284
Purchase Return	390
Return Inward	524
Closing Stock	8,880

c) From the following information extract Gross Profit and Net Profit:

Beginning Inventory	Rs. 2,400	Carriage in	Rs. 524
Purchases	15,205	Wages	2,800
Sales	20,860	Wages Outstanding	96
Return Outward	185	Taxes	1,000
Return Inward	860	Interest Expenses	200
Closing Inventory	3,840		

Video Lecture Costing Concepts

<https://youtu.be/0CfJIPJ751E>

Workbook Solution Costing Concepts

<https://www.accountancyknowledge.com/costing/>

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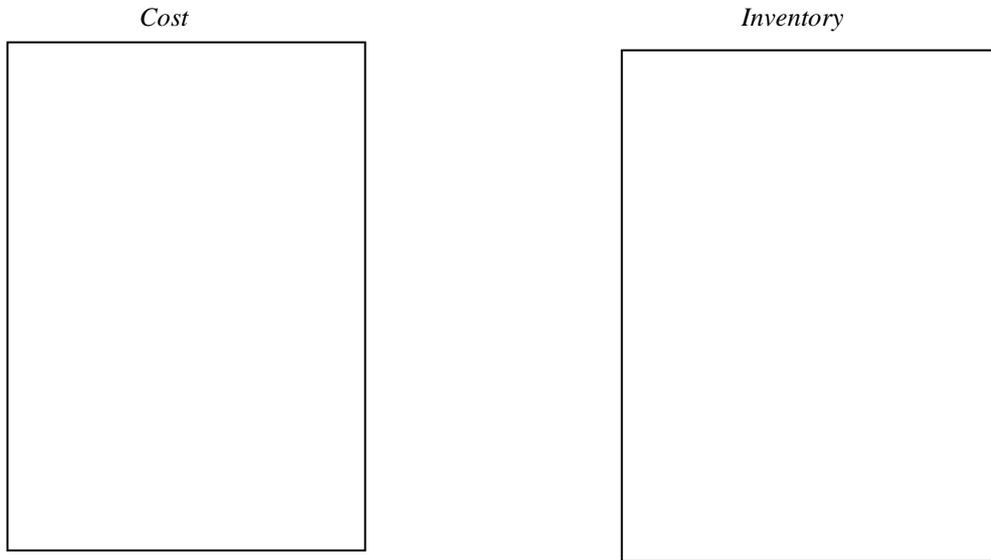
Workbook



COST OF GOODS SOLD

Cost of goods sold (CGS) includes the costs attributable to the production of the goods sold by company. This amount includes the materials cost used in creating the goods along with the direct labor costs used to produce the good and also includes Factory Overhead (FOH) which are all indirect costs. CGS appears on the income statement and can be deducted from net revenue to calculate a company's gross profit.

Six elements for CGS



2.1 Format of Cost of Goods Sold

Name of Company

Cost of Goods Sold Statement

For the year Ended

Opening Inventory		*****
Purchases	*****	
Purchase Return/Discount/Allowances	(*****)	
Net Purchase		*****
Direct Expenses		*****
Material Available for use		*****
Closing Inventory		(*****)
Direct Material used		*****
Direct Labor		*****
Prime Cost		*****
Factory Overhead Cost		*****
Total Factory Cost		*****
Opening Work in Process		*****
Cost of Goods to be Manufactured		*****
Closing Work in Process		(*****)
Cost of Goods Manufactured		*****
Opening Finished Goods		*****
Cost of Goods to be Sold		*****
Closing Finished Goods		(*****)
Cost of Goods Sold		*****

2.2 Some Important Equation

1. Direct Material Used = Opening Inventory + Net Purchases (Purchases - all contra purchases) + Direct Expenses - Ending Inventory
2. Prime Cost = Direct Material Cost + Direct Expenses Cost + Direct Labor Cost
3. Total Factory Cost = Direct Material Cost + Direct Expenses + Direct Labor Cost + Factory Overhead Cost (All indirect expense of factory are called FOH)
4. Conversion Cost = Direct Labor Cost + FOH Cost
5. Cost of Goods Manufactured = Total Factory Cost + Opening Work in Process - Ending Work in Process
6. Cost of Goods Sold = Cost of Goods Manufactured + Opening Finished Goods - Ending Finished Goods
7. Gross Profit/Loss = Net Sales (Sales - all contra sales) - Cost of Goods Sold
8. Operating Profit/Loss = Gross Profit - Commercial Expenses
9. Net Profit/Loss = Operating Profit - Financial Charges - Taxes - Other Expenses + other income
10. Per Unit Cost = Cost of Goods Manufactured / No. of Units Produced

Example # 2.1: The following are the figures relating to the YYY Commodity Production for the month of March, 2010.

Description	Amount	Description	Amount
Stock on 1.03.2010_ Raw Material	Rs. 75,000	Stock on 31.03.2010_ Raw Material	Rs. 50,000
Factory overheads	8,000	Sales	270,000
Purchases of Raw Material	100,000	Carriage on Purchases	5,000
Stock on 1.03.2010_ Finished Goods	48,000	Stock on 31.03.2010_ Finished Goods	25,000
Direct Labor	12,000	Office & Admin Overhead	3,000
Return inward	10,000	Marketing Expenses	15,000
Work in process on 1.03.2010	5,000	Work in process on 31.03.2010	3,000

Requirement: Prepare statement showing Prime Cost; Conversion Cost; Total Cost; Cost of Goods Manufactured; Cost of Goods Sold. Calculate Gross Profit; Net Profit and per unit cost by assuming that 38,000 units were produced during March.

Further Study and Practice of Cost of Goods Sold

Video Lecture (Cost of Goods Sold)

<https://youtu.be/yV-rKH3fDxE>

Workbook Solution (Cost of Goods Sold)

<https://www.accountancyknowledge.com/cost-of-goods-sold/>

Practice MCQs (Cost of Goods Sold)

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Practice Problems with Solutions (Cost of Goods Sold)

<https://www.accountancyknowledge.com/cost-of-goods-sold-problems-and-solutions/>



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Financial Statements

3.1 Income Statement

- ☞ An Income Statement presents the results of a company's operations for a given reporting period
- ☞ Accountants in accordance with General Acceptable Accounting Principles (GAAP) prepare it
- ☞ The Income Statement presents the Revenues earned and Expenses incurred by an entity during a specific time period, resultant in a figure known as Net profit or Net loss.

Standard Format for Income Statement (Statement/Report Form)

Name of Company		
<i>Income Statement</i>		
<i>During the Period ended</i>		
Descriptions	Rs.	Rs.
Sales	*****	
Sales Return/Discounts/Allowances etc.	(****)	
Net Sales		*****
Cost of Goods/Sales/Services Sold		(*****)
Gross Profit/Loss		*****
Commercial Expenses:		
Selling Expenses	*****	
Administrative Expenses	*****	
Operating Profit		****
Other Income		***
Other Expenses		(**)
Earnings Before Interest and Taxes (EBIT)		*****
Financial Charges		(****)
Earnings Before Tax (EBT)		*****
Tax		(**)
Net Profit		*****
Dividend		*****
Add to Retained Earning		*****

3.2 Balance Sheet

- ❖ A Financial Statement that summarizes a company's Assets, Liabilities and Owner Equity at a specific point in time called Balance Sheet. It shows financial position of the business
- ❖ The Balance Sheet must follow the following formula: $Assets = Liabilities + Shareholders' Equity$

Standard Format for Balance Sheet (Statement/Report Form)

Name of Company
Balance Statement
As on

Description	Rs.	Rs.
Assets		
Current Assets:		
Cash & Cash equivalents in hand	****	
Cash at Bank	*****	
Marketable Securities	*****	
Note Receivables	****	
Account Receivables	****	
Inventory	****	
Other Current Assets	****	
Prepaid Expenses	****	
<i>Total Current Assets</i>		*****
Long Term Assets:		
Advance to employees	*****	
Bonds Investments	****	
Goodwill/Rights/Patents/Trade Mark etc.	****	
Other Long Term Assets	****	
<i>Total Long Term Assets</i>		*****
Fixed Assets:		
Furniture	*****	
Accumulated Depreciation	(*****)	*****
Machinery	*****	
Accumulated Depreciation	(*****)	*****
Building	*****	
Accumulated Depreciation	(*****)	*****
Land	*****	
<i>Total Fixed Assets</i>		*****
Other Assets		*****
Total Assets		*****
Liabilities		
Current Liabilities:		
Note Payable	*****	
Account Payable	*****	
Expenses Outstanding/Payable	****	

Cost Accounting

Unearned Revenues	*****	
Other Current Liabilities	*****	
<i>Total Current Liabilities</i>		*****
Long Term Liabilities:		
Bank Loan	****	
Bonds Outstanding	*****	
Mortgage Loan	*****	
Debentures	*****	
Other Long Term Liabilities	*****	
<i>Total Long Term Liabilities</i>		*****
Total Liabilities		*****
Shareholder's Equity		
Preferred Stock/Shares	*****	
Common/Ordinary Shares/Stock	****	
Retain Earning	****	
Other Reserves	****	
Total Owner Equity		*****
Total Equities		*****

Example # 3.1: From the following particulars taken out from the books of Mirpur Ltd. you are required to prepare Cost of Goods Sold, Income Statement and Balance Sheet as at June 30th, 2010.

Mirpur Ltd.
Trial Balance
June 30th, 2010

S #	Heads of Accounts	Ref	Amount	
			Dr	Cr
1	Cash		4,000	
2	Sales			27,000
3	General Reserve			3,000
4	Purchases		4,500	
5	Transportation in		800	
5	Note Payable			1,600
6	Other Expense		400	
7	Commission received			3,200
8	Note Receivable		700	
9	Account Receivable		1,400	
10	Salaries Payable			100
11	Prepaid Rent		500	
12	Inventory:			
13	Raw Material		800	
14	Work-in-Process		1,000	
15	Finish Goods		1,200	
16	Return inward		1,300	
17	Carriage inward		250	
18	Return outward			650
19	Transportation outward		150	
20	Financial Charges		1,200	
21	Advertisement Expenses		2,200	

Total Factory Cost		8,500
Cost of Goods sold		Rs. 9,000

Mirpur Ltd.
Income Statement
For the year ended June 30th, 2010

Descriptions	Rs.	Rs.
Gross Profit		16,700
Operating Profit		12,750
Earnings Before Interest and Taxes (EBIT)		15,550
Net Profit		11,150
Retain Earning		7,650

<i>Total Long Term Liabilities</i>		55,400
<i>Total Liabilities</i>		
<i>Owner Equity</i>		
<i>Total Owner Equity</i>		53,700
<i>Total Equities</i>		

Further Study and Practice of Financial Statements

Video Lecture (Financial Statements)

<https://youtu.be/0YJ7zdeUtO4>

Practice MCQs (Financial Statements)

<https://www.accountancyknowledge.com/financial-statement-mcqs/>

Working Page

INVENTORY VALUATION (I)

- Inventory is tangible goods held for resale in the normal course of business or that will be used in producing goods (manufacturer) for sale
- Assets not normally held for resale are excluded from merchandise inventory
- An important aspect of inventory accounting is determining inventory ownership
- If the buyer is responsible for freight charges (FOB factory or shipping point), ownership passes to the buyer as soon as goods are loaded
- If the seller pays for the freight charges (FOB destination), ownership passes to the buyer only when the goods arrive at the destination
- The cost of inventory includes all expenses made in bringing the goods or assets to their existing condition and location for sale
- Inventory cost therefore equals invoice price less discounts (if any), plus transportation, storage, import duties, insurance, and other costs of preparing the inventory for sale
- These additional or incidental costs add value to the inventory and should be included in the purchase cost



4.1 Inventory Valuation System

Merchandising companies use one of two systems to account for inventory

4.1.1 Perpetual Inventory System

- A Perpetual Inventory System is one in which continuous stock records of inflow and outflow of inventory are kept
- Every time a unit of good is bought or sold, such a transaction is updated in the stock records. By doing so, the enterprise can determine the cost of goods on hand (Closing stock) by just looking at the stock records, without the need to perform a stock count
- Under this inventory method, the cost of goods sold is determined each time a sale is made. The company's cost of the merchandise is debited to the CGS expense account at the time of each sale to a customer
- Purchases of merchandise are recorded (as increases or debits) in the Inventory account. The Inventory account is reduced (or credited) each time a sale is made by whatever amount the goods cost the company

4.1.2 Periodic / Physical Inventory System

- A Periodic Inventory system determines the inventory at the beginning and end of certain periods of time (by physical count) such as annually, semi-annually, quarterly, or monthly
- When a business maintains a periodic inventory system, it does not consistently update information about the cost of goods sold, or the stock balance on a particular day
- As merchandise is purchased its cost is recorded in the purchase account. No entry is made for cost of goods sold
- Therefore, at the end of the period, opening and ending inventories are adjusted against cost of goods sold account or profit and loss account



Comparison of Journal Entries for each method:

Perpetual	Periodic
<i>To purchase inventory item (on credit):</i>	
Inventory Account Payable	Purchases Account Payable
<i>To make a return (on credit):</i>	
Account Payable Inventory	Account Payable Purchases
<i>To record a credit sale (2 entry) :</i>	
Account Receivable Sales	Account Receivable Sales
Cost of Goods Sold Inventory	
<i>End of the year (No entry):</i>	
	Cost of Goods Sold Opening Stock
	Closing Stock Cost of Goods Sold

Example 4.1: The following examples illustrate the differences in the journal entries and ledger accounts for Inventory and Cost of Goods Sold, which are required under the Perpetual and Periodic Inventory System?

- (a) On December 12, a company purchases 300 units at Rs. 2 per unit on account

Perpetual		Periodic	
12/12		12/12	

(b) One December, 20 a company sold 100 units at Rs. 5 unit on credit

Perpetual		Periodic	
20/12		20/12	
20/12			

(c) On December, 31, the books are closed and financial statements are prepaid assuming that 900 units are opening stock at rate Rs. 2 per unit and 1,100 unit of closing stock at 2 per unit.

Perpetual		Periodic	
		31/12	
		31/12	

Example 4.2: From the following journal entries prepare ledger accounts for Inventory and Cost of Goods Sold, which are required under the Perpetual and Periodic Inventory Systems.

Perpetual		Periodic	
12/12	Inventory 600	12/12	Purchases 600
	Account Payable 600		Account Payable 600
20/12	Account Receivable 500	20/12	Account Receivable 500
	Sales 100		Sales 100
20/12	Cost of Goods Sold 200		
	Inventory 200		
		31/12	Cost of Goods Sold 1,800
			Opening Inventory 1,800
		31/12	Closing Inventory 2,200
			Cost of Goods Sold 2,200

Solution: Inventory and Cost of Goods Sold accounts in Perpetual Inventory System

Account # 1				Inventory Account				Page #
Date	Description	Ref	Amount	Date	Description	Ref	Amount	
Total				Total				

Account # 2				Cost of Goods Sold				Page #
Date	Description	Ref	Amount	Date	Description	Ref	Amount	
Total				Total				

Solution: Inventory and Cost of Goods Sold accounts in Periodic Inventory System

Account # 1				Inventory Account				Page #
Date	Description	Ref	Amount	Date	Description	Ref	Amount	
Total				Total				

Account # 2				Cost of Goods Sold				Page #
Date	Description	Ref	Amount	Date	Description	Ref	Amount	
Total				Total				

Remember: Formula for GGS in Periodic Inventory System is

$$CGS = \text{Opening Inventory} + \text{Net Purchases} - \text{Closing Stock}$$

4.2 Inventory Valuation Methods

Two methods are used to value the inventory

4.2.1 Specific Identification Method

- ❖ The Specific Identification Method can only be used for items that can in some way be labeled and identified (Heterogeneous)
- ❖ The specific identification inventory costing method identifies and uses the purchase invoice of each item sold to determine the cost assigned to cost of goods sold and to the ending inventory
- ❖ Specific identification will produce identical results under either a perpetual or a periodic inventory system

4.2.2 Cost Flow Assumptions

Three Cost Flow Assumptions are used, discuss below both for perpetual inventory system and periodic inventory system

4.2.2.1 FIFO:

- The first-in, first-out inventory costing method is based on the assumption that the first items received were the first items sold
- In other words, items in the beginning inventory or the oldest items are assumed to be sold first
- The most recent inventory purchased is assumed to remain in ending inventory

Example 4.3: You are required to value the inventory by FIFO (Perpetual System). Opening Inventory is 8 Units at Rate of Rs. 10 at start of December and during the year the following were the purchases and sales of inventory:

<u>Purchases</u>		<u>Sales</u>	
2/12	6 units @ Rs. 12	15/12	4 units @ Rs. 22
22/12	10 units @ Rs. 16	31/12	14 units @ Rs. 25

Solution:

Store Ledger Card (SLC)

Date	Descriptions	Purchased			Sales			Balance		
		Unit	@	Amount	Unit	@	Amount	Unit	@	Amount
1/12										
2/12										
15/12										
22/12										
31/12										
Total		16	-	232	18	-	216	6	-	96

4.2.2.2 LIFO:

- The last-in, first-out inventory costing method is based on the assumption that the last items received were the first items sold
- In other words, the most recent purchases are assumed to be sold first and the old goods remain in inventory. However, the assumed flow of goods can differ from the actual physical flow
- During inflationary times, recent costs are higher than old costs, resulting in higher cost of goods sold, lower net income, and lower income taxes

Example 4.4: You are required to value the inventory by LIFO (Perpetual System). Opening Inventory is 8 Units at Rate of Rs. 10 at start of December and during the year the following were the purchases and sales of inventory:

Purchases

2/12 6 units @ Rs. 12
 22/12 10 units @ Rs. 16

Sales

15/12 4 units @ Rs. 22
 31/12 14 units @ Rs. 25

Solution:

Store Ledger Card (SLC)

Date	Descriptions	Purchased			Sales			Balance		
		Unit	@	Amount	Unit	@	Amount	Unit	@	Amount
1/12										
2/12										
15/12										
22/12										
31/12										
Total		16	-	232	18	-	252	6	-	60

4.2.2.3 Average or Weighted Average:

- ✓ The weighted-average inventory costing method uses a weighted-average cost per inventory unit in assigning cost to units sold and to inventory
- ✓ A weighted-average is recalculated at the time of each purchase

Example 4.5: You are required to value the inventory by weighted average (Perpetual System). Opening Inventory is 8 Units at Rate of Rs. 10 at start of December and during the year the following were the purchases and sales of inventory:

<u>Purchases</u>			<u>Sales</u>		
2/12	6 units @ Rs. 12		15/12	4 units @ Rs. 22	
22/12	10 units @ Rs. 16		31/12	14 units @ Rs. 25	

Solution:

Store Ledger Card (SLC)

Date	Descriptions	Purchased			Sales			Balance		
		Unit	@	Amount	Unit	@	Amount	Unit	@	Amount
1/12										
2/12										
15/12										
22/12										
31/12										
Total		16	-	232	18	-	231.46	6	-	80.58

Comparative Cost Sheet (in amount)

<i>Methods</i>	<i>Balance</i>	<i>Purchases</i>	<i>(Closing Stock)</i>	<i>CGS</i>	<i>Sales</i>	<i>(CGS)</i>	<i>Gross Profit</i>
<i>FIFO</i>							Rs. 222
<i>LIFO</i>							Rs. 186
<i>Average</i>							Rs. 206.58

Further Study and Practice of Inventory Valuation

Video Lecture (Inventory Valuation)

<https://youtu.be/hMorHAyfv-Q>

Workbook Solution (Inventory Valuation)

<https://www.accountancyknowledge.com/inventory-valuation/>

Practice MCQs (Inventory Valuation)

<https://www.accountancyknowledge.com/inventory-valuation-mcqs/>

Practice Problems with Solutions (Inventory Valuation)

<https://www.accountancyknowledge.com/inventory-valuation-problems-and-solutions/>

INVENTORY VALUATION II

5.1 Results Variation in Inventory Valuation Methods

- Each method is based on a different assumption about the cost of the merchandise that are sold and the cost of the merchandise that are left in ending inventory.

Method	Cost of Sales	Cost of Ending Inventory
Specific Identification	Specifically identified	What is left over
First-in, first-out	First items purchased	Last items purchased
Last-in, first-out	Last items purchased	First items purchased
Average	Computed using an average cost	Computed using an average cost

5.2 Impact of LIFO and FIFO in periods of rising prices

Following are some impact on financial by using LIFO or FIFO

	LIFO	FIFO
Cost of goods sold	Higher	Lower
Income before taxes	Lower	Higher
Income taxes	Lower	Higher
Net income	Lower	Higher
Inventory balance	Lower	Higher

5.3 Cost flow Assumption under Periodic Inventory System

- In physical inventory system stock taking are done at the end of period
- No up-to-date record for cost of sales are available
- In this type of problems issuing date are not mention

Example 5.1: You are required to value the inventory (Cost of Sales and Ending Inventory) by FIFO, LIFO and Weighted average (Periodic System) and Comparative Cost Sheet in amount:

Date		Units	@	Total
1 Jan	Balance	100	10	Rs. 1,000
5 Jan	Purchases	100	11	1,100
10 Jan	Purchases	150	12	1,800

During the period 300 unit were sold @ Rs. 15 per unit

Solution: FIFO

<i>Cost of Sales</i>		
Units	@	Amount

<i>Cost Ending Inventory</i>		
Units	@	Amount

Solution: LIFO

<i>Cost of Sales</i>		
Units	@	Amount

<i>Cost Ending Inventory</i>		
Units	@	Amount

Solution: W. Avg

<i>Cost of Sales</i>		
Units	@	Amount

<i>Cost Ending Inventory</i>		
Units	@	Amount

W. Avg Rate =

Comparative Cost Sheet (in amount)

Methods	Balance	Purchases	(Closing Stock)	CGS	Sales	(CGS)	Gross Profit
<i>FIFO</i>							1,200
<i>LIFO</i>							1,100
<i>Average</i>							1,157

Video Lecture (Inventory Valuation)

<https://youtu.be/hMorHAyfv-Q>

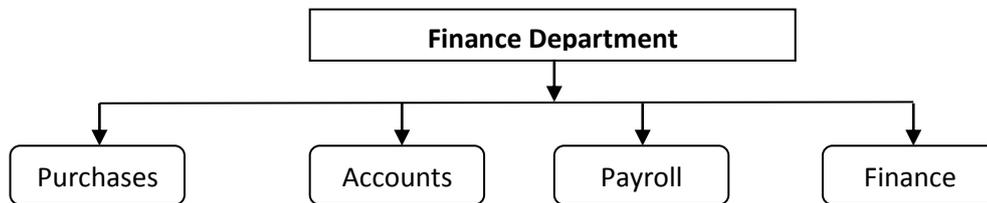
Inventory Management

Inventory means material that is used as input for production of finished output or rendering of services or for office use and packaging. It will also ensure preparation of accurate statements of the value of inventory consumed by each department/job and final statements prepared according to their needs

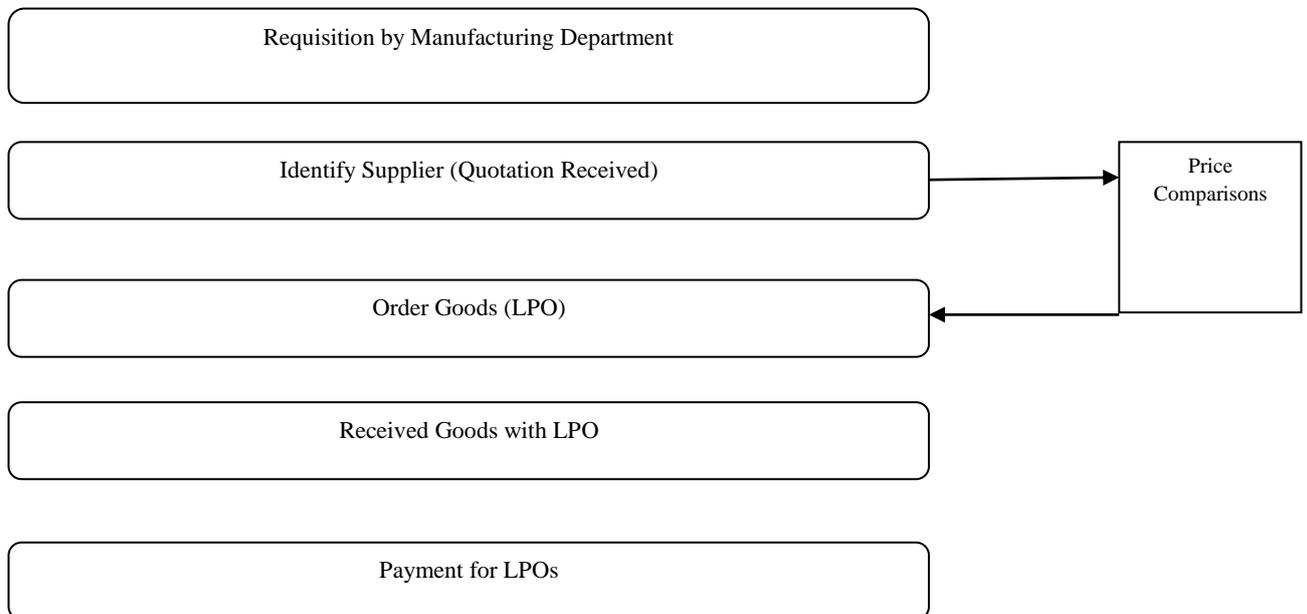
Inventory Management

From the inventory management point of view, the following are some important requirements of the effective material control:

- ❖ That no inventory is purchased without proper authority
- ❖ That the quantity of inventory purchased is in fact received
- ❖ That there should be proper storage facilities
- ❖ That no material is issued without proper authorization and the purpose for which the material is required is recorded
- ❖ That the accounts provide a running balance of the value of the inventory on hand
- ❖ Large business have specialized purchase departments for effective inventory control



Purchase Process



Levels of Inventory

- ☉ In order to ensure that the optimum quantity of materials is purchased and stock—neither less nor more
- ☉ The storekeeper applies scientific techniques of materials management. Fixing of certain levels for each item of materials. The following levels are generally fixed
 - ☛ Order level
 - ☛ Maximum level
 - ☛ Minimum level
 - ☛ Danger level

Order Stock Level/point

- ★ It is also known as Re-ordering level/point in relation with an item of stock
- ★ It is the point at which it becomes essential to initiate purchase orders for its fresh supplies
- ★ Normally, re-ordering level is a point between the maximum and the minimum stock levels
- ★ Fresh orders must be placed before the actual stocks touch the minimum level, so as to take care of lapse in time the placing of the order and the receipt of materials in stores

$$\text{Order Level} = \text{Maximum Consumption} * \text{Lead Time (Maximum)}$$

- ★ *The maximum consumption:* This is the maximum quantity of the material that is expected to be consumed in a day or in a week or in a month time
- ★ *Lead time:* This is the estimated time period in number of days or in weeks or in months, which is necessarily required for placing an order and finally receiving it in the stores

Maximum Stock Level

- The maximum stock level indicates the maximum quantity of an item of material which can be held in stock at any time

$$\text{Maximum Stock Level} = \text{Reorder level} - (\text{Minimum Consumption} * \text{Lead Time}) + \text{EOQ}$$

- *Re-ordering level:* It is the point at which it becomes essential to initiate purchase orders for its fresh supplies. Normally, re-ordering level is a point between the maximum and the minimum stock levels
- *Minimum consumption:* This is the minimum quantity of the material that is expected to be consumed in a day or in a week or in a month time
- *Lead time:* This is the estimated time period in number of days or in weeks or in months, which is necessarily required for placing an order and finally receiving it in the stores
- *Economic ordering quantity:* It is the level where the ordering quantity will be most economical for organization

Minimum Stock Level

- This represents the quantity below which the stock of any item should not be allowed to fall
- In other words, an enterprise must maintain minimum quantity of stock so that the production is not adversely affected due to non-availability of materials

$$\text{Minimum Stock Level} = \text{Reorder level} - (\text{Average consumption} * \text{lead time})$$

- *Re-ordering level*: It is the point at which it becomes essential to initiate purchase orders for its fresh supplies. Normally, re-ordering level is a point between the maximum and the minimum stock levels
- *Lead time*: This is the estimated time period in number of days or in weeks or in months, which is necessarily required for placing an order and finally receiving it in the stores
- *Average consumption*: This is the average quantity of the material that is expected to be consumed in a day or in a week or in a month time

Danger Stock Level

- ❖ The danger level is below the minimum level and represents a stage where immediate steps are taken for getting stock replenished
- ❖ When the stock reaches danger level it is indicative that if no emergency steps are taken to restock the materials, the stores will be completely exhausted and normal production stopped

$$\text{Danger Stock Level} = \text{Average consumption} \times \text{Emergency time}$$

- ❖ Generally, the danger level of stock is fixed below the minimum level

Illustration 1: What do you understand by maximum stock level, minimum stock level, and re-order level?

Calculate the above from the following data:

Re-order quantity (EOQ)	1,500 units
Lead Time	4 to 6 weeks
Average consumption	325 units per week
Maximum consumption	400 units per week
Minimum consumption	250 units per week

Solution

1. *Re-order level* = *Maximum consumption * Lead Time [maximum]*

Re-order level =

Re-order level =

2. *Maximum stock level* = *Reorder level – (Min consumption * Lead time [minimum]) + EOQ*

Maximum stock level =

Maximum stock level =

3. $Minimum\ stock\ level = Reorder\ level - (Average\ consumption * lead\ time\ [Average])$

Minimum stock level=

Minimum stock level=

Illustration 2: Following is the information provided by the concerned departments about two components Wood and Steel regarding their replenishment and usage:

Minimum usage 25 units per week each
 Maximum usage75 units per week each
 Average usage50 units per week each

Re-ordering Quantity	<i>Wood</i>	300 units
	<i>Steel</i>	500 units
Re-ordering Period	<i>Wood</i>	4 to 6 weeks
	<i>Steel</i>	2 to 4 weeks
Emergency Lead Time	<i>Wood</i>	2 weeks
	<i>Steel</i>	1 week

Calculate for each component:

- | | |
|----------------------------|------------------------|
| 1. Re-order level | 2. Maximum stock level |
| 3. Minimum stock level and | 4. Danger stock level |

Solution

1. $Re\text{-}order\ level = Maximum\ consumption * Lead\ Time\ [maximum]$

Wood

Steel

2. $Maximum\ stock\ level = Reorder\ level - (Min\ consumption * Lead\ time\ [minimum]) + EOQ$

Wood

Steel

3. $Minimum\ stock\ level = Reorder\ level - (Average\ consumption * lead\ time\ [Average])$

$Average\ lead\ time = \frac{Maximum + Minimum}{2}$

2

Wood

Steel

4. $Danger\ stock\ level = Average\ consumption * Emergency\ lead\ time$

Wood

Steel

Illustration 3: In manufacturing its Products, a Company uses three raw materials. A, B and C, in respect of which the following apply on monthly basis

Raw material	Max. Usage per unit Product Kg	Min. Usage Product kg	Re-order Quantity Kg	Price Per kg	Delivery Period			Danger Lead time
					Min	Avg	Max	
A	1,000	500	10,000	0.10	2	3	4	1
B	3,000	1,500	8,000	0.30	3	4	5	2
C	2,000	1,000	6,000	0.15	2	3	4	1

Requirements:

- (a) Re-order level (b) Maximum stock (c) Minimum stock (d) Danger stock level

Solution

a) Re-order level=

- A
- B
- C

b) Maximum stock level=

- A
- B
- C

c) Minimum stock level=

- A
- B
- C

d) Danger stock level = Average consumption x Emergency lead time

- A
- B
- C

Further Study and Practice of Inventory Management

Video Lecture (Inventory Management)

<https://youtu.be/LwvWKaeFui8>

Workbook Solution (Inventory Management)

<https://www.accountancyknowledge.com/inventory-management/>

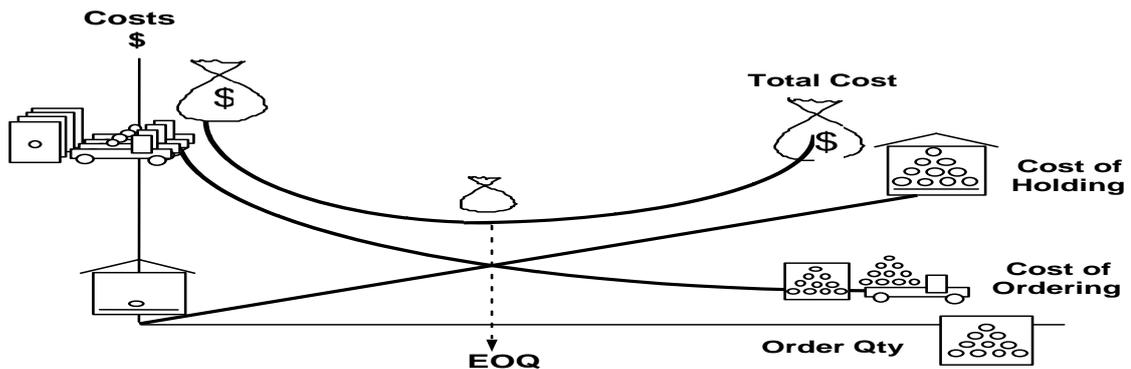
Practice Problems with Solutions (Inventory Management)

<https://www.accountancyknowledge.com/inventory-valuation-problems-and-solutions/>



Economic Order Quantity (EOQ)

- ④ Economic order quantity is the level of inventory that minimizes the total inventory holding costs and ordering costs.
- ④ It is one of the oldest classical production scheduling models
- ④ Economic order quantity refers to that number (quantity) ordered in a single purchase so that the accumulated costs of ordering and carrying costs are at the minimum level
- ④ In other words, the quantity that is ordered at one time should be so, which will minimize the total of
 - 💧 Cost of placing orders and receiving the goods, and
 - 💧 Cost of storing the goods as well as interest on the capital invested.



- ④ The economic order quantity can be determined by the following simple formula:

$$EOQ = \sqrt{\frac{2 * RU * OC}{UC * CC\%}}$$

EOQ = Economic Order Quantity, RU = Annual Required Units, OC = Ordering Cost for one Unit
 UC = Inventory Unit Cost, CC = Carrying Cost as %age of Unit Cost

Illustration 1: Demand for the Child Cycle at Best Buy is 500 units per month. Best Buy incurs a fixed order placement, transportation, and receiving cost of Rs. 4,000 each time an order is placed. Each cycle costs Rs. 500 and the retailer has a holding cost of 20 percent. Evaluate the number of computers that the store manager should order in each replenishment lot?

Solution:

$$EOQ = \sqrt{\frac{2 * RU * OC}{UC * CC\%}}$$

Illustration 2: ABC Ltd. uses EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs. 1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ, No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory.

Solution

1. Economic Order Quantity

2. Number of Order Per Year

$$\text{No of order per year} = \text{Annual Requirements} / \text{EOQ}$$

3. Ordering Cost

$$\text{Ordering Cost} = \text{Fixed ordering cost (F)} * \text{Number of Order per year N}$$

4. Carrying Cost

$$\text{Carrying Cost} = \text{Carrying Cost (C)} * \text{EOQ}/2$$

5. Total Inventory Cost

$$\text{Total Inventory Cost} = \text{Ordering cost} + \text{Carrying Cost}$$

Illustration 3: Midwest Precision Control Corporation is trying to decide between two alternate Order Plans for its inventory of a certain item. Irrespective of the plan to be followed, demand for the item is expected to be 1,000 units annually. Under Plan 1st, Midwest would use a teletype for ordering; order costs would be Rs. 40 per order. Inventory holding costs (carrying cost) would be Rs. 100 per unit per annum. Under Plan 2nd order costs would be Rs. 30 per order. And holding costs would 20% and unit Cost is Rs. 480. Find out EOQ and Total Inventory Cost than decide which Plan would result in the lowest total inventory cost?

Solution:

Plan 1st

$$Total\ Inventory\ Cost = [Fixed\ ordering\ cost\ (F) * Number\ of\ Order\ per\ year\ N] + [Carrying\ Cost\ (C)* EOQ/2]$$

Total Inventory Cost =

Total Inventory Cost =

Plan 2nd

Total Inventory Cost =

Total Inventory Cost =

Total Inventory Cost =

Total Inventory Cost =

Illustration 4: A local TV repairs shop uses 36,000 units of a part each year (A maximum consumption of 100 units per working day). It costs Rs. 20 to place and receive an order. The shop orders in lots of 400 units. It cost Rs. 4 to carry one unit per year of inventory.

Requirements:

- (1) Calculate total annual ordering cost
- (2) Calculate total annual carrying cost
- (3) Calculate total annual inventory cost
- (4) Calculate the Economic Order Quantity
- (5) Calculate the total annual cost inventory cost using EOQ inventory Policy
- (6) How much save using EOQ
- (7) Compute ordering point assuming the lead time is 3 days

Solution: (1) Calculate total annual ordering cost

Solution: (2) Calculate total annual carrying cost

Solution: (3) Calculate total annual inventory cost

Solution: (4) Calculate the Economic Order Quantity

Solution: (5) Calculate the total annual cost inventory cost using EOQ inventory Policy

Solution: (6) How much save using EOQ

Solution: (7) Compute ordering point assuming the lead time is 3 days

Further Study and Practice of Inventory Management

Video Lecture (Economic Order Quantity)

https://youtu.be/OvreD_bvdMA

Practice Problems with Solutions (Economic Order Quantity)

<https://www.accountancyknowledge.com/economic-order-quantity-problems-and-solutions/>

COST VOLUME PROFIT ANALYSIS (I)

Basically, break-even analysis determines the “break-even point”, at which operations neither make money nor lose money. At the break-even point, there is no gain or loss; hence costs or expenses are equal to revenues/incomes. Determining the break-even point for a business is the useful business planning tool.

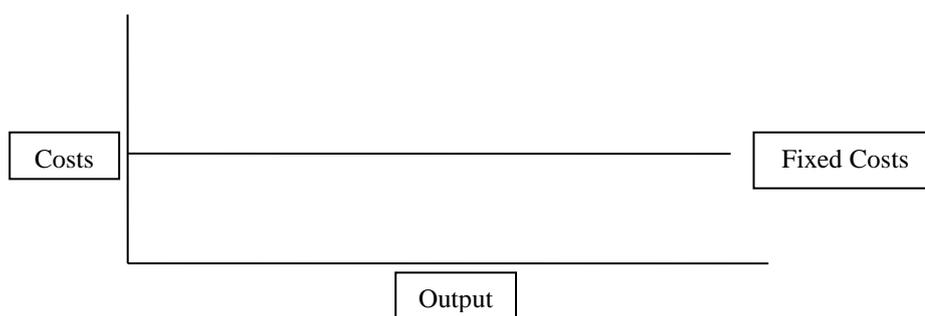
Cost, Revenue and Profit

Following are costs and revenues are used for break-even analysis

Fixed Cost

Fixed costs are those that remain the same regardless of sales volume or production. They are expressed usually in amount or rupees say Rs. 200,000. Rent, insurance, supervisory salary and real estate taxes are usually examples of fixed cost

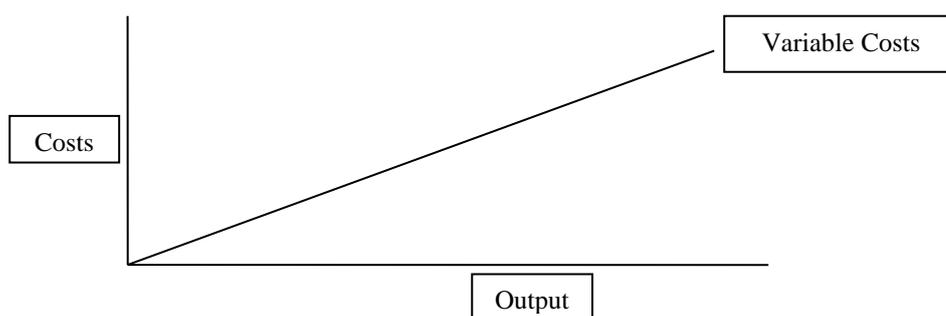
- ❖ Fixed cost remains the same whether the business produces nothing or is working at full capacity
- ❖ Fixed cost per unit is variable, when production increase it decrease and vice versa



Variable Cost

Variable costs are those which change as sales volume or production changes. They are expressed usually as a percent of sold units like 8% of sales. Inventory, raw materials and direct production labor, for example, are usually variable costs.

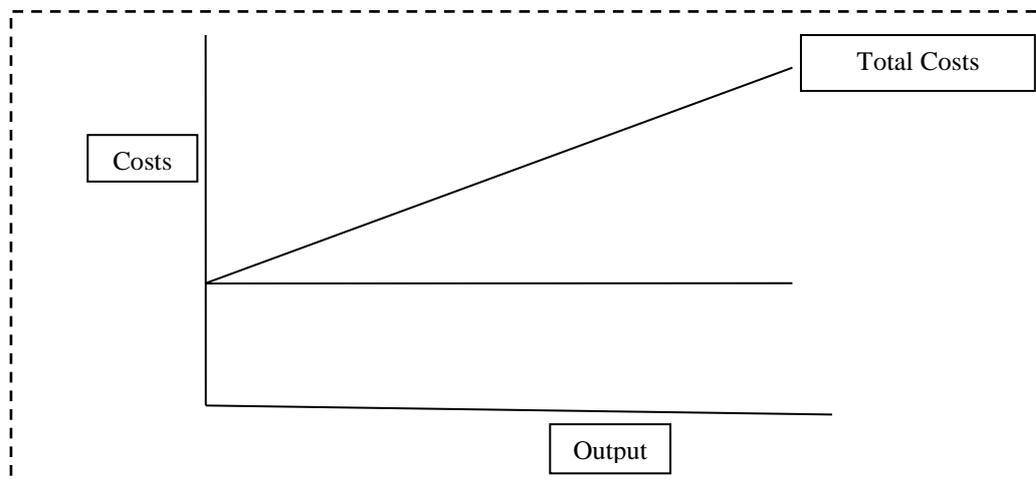
- Variable Cost = Variable Cost per Unit x Sold Units
- Variable cost per unit is fixed



Total Costs

By adding fixed and variable cost we derive total cost

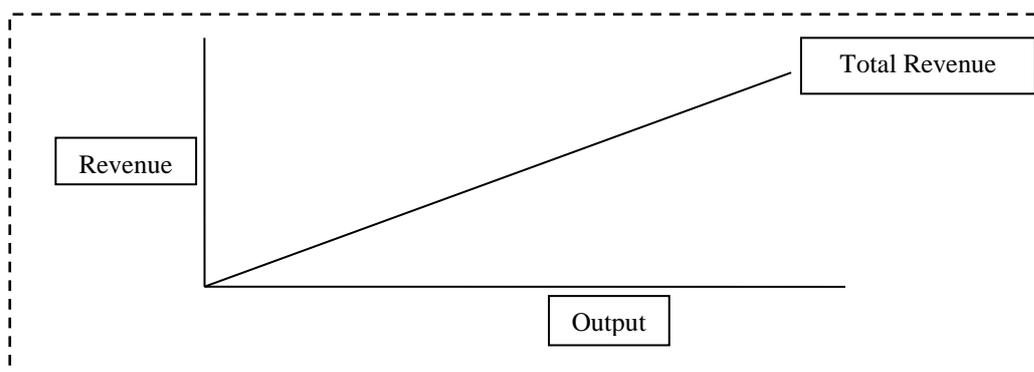
$$\text{Total Cost} = \text{Fixed Cost} + \text{Variable Cost}$$



Total Revenue

This is the amount of money that a firm receives from selling the product or providing services

$$\text{Total Revenue} = \text{Price per Unit} \times \text{Sold Units}$$



Profit

Profit is net of revenue from expenses. The state when revenues are higher side and expenses are in lower side is called profit.

$$\text{Profit} = \text{Total Revenue} - \text{Total Cost}$$

$$\text{Profit} = \text{SP} (X) - \text{VC} (X) - \text{FC}$$

SP = Selling price;

X = Quantity of units produced or sale

VC = Variable cost and

FC = Fixed cost

Example # 1: Ahmed, Inc. produces and sells a single product for Rs. 40 per unit. Costs are: variable cost per unit Rs. 30 and fixed costs Rs. 360,000. Using the profit equation determine the break-even point in units.

Solution:

$$\text{Profit} = \text{SP (X)} - \text{VC (X)} - \text{FC}$$

Contribution Margin

Contribution Margin is the amount of money remaining after the variable costs of producing or purchasing is subtracted from the selling price.

- Contribution margin = Selling price - Variable cost
- Contribution margin can be calculated as per unit and as a ratio

$$\text{Contribution Margin (per unit)} = \text{Selling price per unit} - \text{Variable costs per unit}$$

$$\text{Contribution Margin (ratio)} = 1 - [\text{Variable costs} / \text{Selling price}]$$

Cost-Volume-Profit (CVP) Analysis

Calculating break-even is also referred to as Cost-Volume-Profit Analysis (CVP) or Contribution Analysis. Break even analysis is sometimes referred to as cost-volume-profit analysis because these are three key elements (i.e. cost, volume and profit) in the calculation. It is sometimes referred to as contribution analysis because calculating break even requires determining how many service or product contributions (selling price per unit minus variable costs per unit) are necessary to cover, or pay for, the product's expected fixed costs. CVP Analysis includes:

1. Break-Even in units and amount
2. Margin of Safety
3. Calculating the Target Sales (in units and amount) required to achieve target profit
4. Estimated Future Profit
5. Deciding Selling Price

Break-Even in units and amount

Break-even is volume of sales or units at which business just 'break even'. At break-even point total cost is equal to total revenue. At break-even point, total contribution is just large enough to cover fixed cost. There are two methods for calculating break-even point in unit and amount:

- ✓ Mathematical equation
- ✓ Graphical presentation

Mathematical Equations for Break-even Analysis: Following are equations for Break-even analysis

Break-Even in Rupee = Total Fixed Cost / Contribution Margin Ratio

$$\text{Break - even in Rupee} = \frac{\text{Total Fixed Cost}}{1 - \frac{\text{Variable Cost}}{\text{Selling Price}}}$$

Break-Even in Units = Total Fixed Cost / Contribution Margin per unit

$$\text{Breakeven in units} = \frac{\text{Total Fixed Cost}}{\text{Price per unit} - \text{Variable Cost per unit}}$$

$$\text{Breakeven Capacity} = \frac{\text{Breakeven sales}}{\text{Normal Sales}}$$

Example # 2: A Company has fixed costs of Rs. 10,000 for this period. Direct labor is Rs. 1.50 per unit, and material is Rs. 0.75 per unit. The selling price is Rs. 4.00 per unit and normal sales is Rs. 24,000. Find the break-even point in dollars and in units and also break-even capacity?

Solution

The break-even point in dollars

The break-even point in units

Break-even capacity

Example # 3: Following data is extracted from Ali (Pvt.) Ltd. You are required to calculate the break-even in rupees, in units and capacity. The data shows sales Rs. 5,000,000, per unit sale price Rs. 4 and variable cost per unit is 2.4.

Accounts	Total	Variable	Fixed
Material	1,000,000	1,000,000	0
Labor	1,400,000	1,400,000	0
FOH	1,600,000	400,000	1,200,000
Marketing Expenses	350,000	150,000	200,000
Admin Expenses	250,000	50,000	200,000

Solution

The break-even point in dollars

The break-even point in units is:

The break-even capacity

Margin of Safety

Actual sales volume may not be the same as budgeted sales volume. Actual sales may fall short or exceed to budget. The difference between the budgeted sales volume and the break-even sales volume is known as the margin of safety. It usually expressed as a percentage of budgeted sales ($100/\text{Budgeted Sales} \times \text{Margin of Safety}$).

$$\text{Margin of Safety} = \text{Budgeted Sales Units} - \text{Break-Even Sales Units}$$

Example # 4: Following data extracted from the books of ABC Company:

Budgeted sales	80,000 units	Selling price	Rs. 8
Variable cost	Rs. 4 per unit	Fixed cost	Rs. 200,000

Solution:

Further Study and Practice of Inventory Management

Video Lecture (Cost Volume Profit Analysis)

<https://youtu.be/dLBsoqKa6B0>

Workbook Solution (Cost Volume Profit Analysis)

<https://www.accountancyknowledge.com/cost-volume-profit-analysis/>

Practice MCQs (Cost Volume Profit Analysis)

<https://www.accountancyknowledge.com/cost-volume-profit-analysis-mcqs/>

Practice Problems with Solutions (Cost Volume Profit Analysis)

<https://www.accountancyknowledge.com/cost-volume-profit-analysis-problems-and-solutions/>

COST VOLUME PROFIT ANALYSIS (II)

Calculating the Target Sales (in units and amount) required to achieve target profit

CVP analysis can also be used to calculate the volume of sales that would be required to achieve a target level of profit. To achieve the target profit, the business will have to earn enough contribution to cover all of its fixed cost and then make the required amount of profit.

$$\text{Break-Even in Rupee} = (\text{Total Fixed Cost} + \text{Profit}) / \text{Contribution Margin Ratio}$$

$$\text{Target Sales in Rupee} = \frac{\text{Total Fixed Cost} + \text{Profit}}{1 - \frac{\text{Variable Cost}}{\text{Selling Price}}}$$

$$\text{Break-Even in Units} = (\text{Total Fixed Cost} + \text{Profit}) / \text{Contribution Margin per unit}$$

$$\text{Target Sales in units} = \frac{\text{Total Fixed Cost} + \text{Profit}}{\text{Price per unit} - \text{Variable Cost per unit}}$$

Example # 1: ABC Foods just purchased Sports Drink Company located in Abbottabad. You have been hired to run it as Financial Manager. Corporate headquarters wants you to improve the profitability of the company. You decide to use break-even analysis to help reach the “right” decision. You have the following information: The wholesale price per case is Rs. 15; Variable costs: direct labor, materials, and variable factory overhead are Rs. 5.50 per case and Fixed overhead, including your salary, and other costs that will not change with production volume are Rs. 80,000 per month. What should be targeted sales to achieve a target profit of Rs. 30,000 in Rupee and in Units?

Solution

$$\text{Target Sales (in Rupee)} = \frac{\text{Total Fixed Costs} + \text{Target Profit}}{\text{Contribution Margin Ratio}}$$

Estimated future profit

CVP analysis is used to estimate future profits

Example # 2: ZC Limited makes and sells a single product. It budgeted sales for the next year are 40,000 units.

The Product sells for Rs. 18

Variable cost of production and sales are:

Direct material	2.40	Direct labor	5.00
Variable production overhead	0.50	Variable selling overhead	1.25

Fixed expenses are estimated for the year as:

Fixed production overhead	80,000	Administration costs	60,000
Fixed selling costs	90,000		

Required: Calculate the expected profit for the year

Solution:

Deciding Selling Price

CVP analysis can be useful in helping management to compare different courses of action and select the option that will earn the biggest profit. For example, management might be considering two or more different selling prices for a product, and want to select the profit maximization price. The profit maximization price is the contribution maximization price.

Example # 3: A company has developed a new product which has a variable cost of Rs. 12. Fixed cost relating to this product is Rs. 48,000 each month. Management is trying to decide what the selling price for the product should be. A market research has suggested that monthly sales demand for the product will depend upon the selling price chosen as follows:

Sales Price	Rs. 16	Rs. 17	Rs. 18
Expected monthly Sales	17,000 Units	14,500 Units	11,500 Units

Required: Identify the selling price at which the expected profit will be maximized

Solution:

Multiple-Product Break-Even Analysis

Break-even can be calculated for multiple-product

Example # 4: Star Wood Company produces Chairs and Tables. Fixed costs are Rs. 1,290,000 per year. Sales revenue and variable costs per unit are as follow:

	<i>Chairs</i>	<i>Tables</i>
Sales Price	Rs. 20	Rs. 25
Variable Costs	8	10

Requirements:

- (a) Suppose the company currently sells 140,000 Chairs per year and 60,000 Tables per year. Assuming the sales mix stays constant how many Chairs and Tables must the company sell to break-even in units?
- (b) Suppose the company currently sells 60,000 chairs per year and 140,000 tables per year. Assuming the sales mix stays constant, how many chairs and tables must the company sell to break even per year?

Solution (a):

<i>Units</i>	<i>Chairs</i>	<i>Tables</i>	<i>Total</i>

Break-even in Unit = Fixed Cost / Weighted Average Contribution Margin

Weighted Average Contribution Margin = Total Contribution / Total units

Contribution Margin Income Statement

The contribution margin income statement is preferable for internal, management purposes. It separates costs by their behavior: variable costs or fixed costs. It also works very well with CVP analysis.

Example # 5: Let's see what happens when we sell all 60,000 units that were produced. Make a contribution margin income statement:

Production	60,000 units	Assume no opening inventory
Sales	60,000 units	Rs. 12/unit
Costs:		
Direct material	Rs. 180,000	Rs. 3 per unit produced
Direct labor	Rs. 120,000	Rs. 2 per unit produced
Variable overhead	Rs. 60,000	Rs. 1 per unit produced
Fixed overhead	Rs. 150,000	
Variable selling/administrative	Rs. 60,000	Rs. 1 per unit sold
Fixed selling/administrative	Rs. 30,000	

Solution:

Contribution Margin Income Statement

Sales (60,000 x Rs. 12)		
Less variable costs		
Direct material (60,000 x Rs. 3)		
Direct labor (60,000 x Rs. 2)		
Variable overhead (60,000 x Rs. 1)		
Variable selling & administrative (60,000 x Rs. 1)		
Contribution margin		
Less fixed costs		
Fixed overhead		
Fixed selling & administrative		
Operating income		Rs. 120,000

Further Study and Practice of Inventory Valuation

Video Lecture (Cost Volume Profit Analysis)

<https://youtu.be/b14IY2y6so8> (Part 1)

<https://youtu.be/FRHxONSgYus> (Part 2)

Workbook Solution (Cost Volume Profit Analysis)

<https://www.accountancyknowledge.com/cost-volume-profit-analysis/>

Practice MCQs (Cost Volume Profit Analysis)

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Practice Problems with Solutions (Cost Volume Profit Analysis)

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LABOR COSTING (I)

- Labor accounting assumes importance, as it is the second major item of cost of production
- Like material, cost of labor also should be controlled for reducing cost of production and improving the effectiveness
- The total amount of wages and salaries paid by a company to its employees is called payroll

9.1 Payroll

- ✓ A list of a company's employees and the amount of money they are to be paid is called payroll
- ✓ Payroll expense consists of:
 - Labor cost (Direct and indirect)
 - Administrative staff expenses (Fixed and variable)
 - Selling and distribution staff expenses (Fixed and variable)
 - Labor related cost (Commission, Overtime pay, bonus pay, shift allowances, and other benefits)

9.2 Employee Pay

- Financial compensation paid to an employee by an employer for work done
- Amount of money paid to an employee by an employer in return for work performed
- Pay has two parts i.e. Gross pay and Net pay

9.2.1 Gross Pay or Employer's Payment

- ❖ The amount of pay to which an employee is entitled may be earned in a variety of different ways. These include:
 - a.* Basic pay, such as:
 - Wages paid according to the number of hours worked
 - Wages paid according to the output of the employee
 - Salaries, for salaried staff
 - b.* Allowances, such as:
 - House rent
 - Compensatory allowance
 - Medical allowance etc.
 - c.* Bonuses and commission, such as:
 - Bonuses paid under bonus schemes, based on productivity, or profitability
 - Commission paid, normally based on sales
 - d.* Other pay, such as:
 - Overtime pay, for extra hours worked by the employee
 - Shift pay, to compensate for unsocial hours

9.2.2 Net Pay or Take Home Pay

- Net pay is equal to Gross pay minus Total Deductions
- Deductions are two type i.e. Statutory and Non-Statutory Deductions
 - Statutory deductions are deductions from pay that are made by state or law. In the Pakistan income tax is taken away from gross pay and paid to Income Tax Department
 - Non-statutory deductions are voluntary deductions from pay that the employee chooses to make Examples of these are:
 - Contributions by the employee to a pension scheme
 - Any advance taken by employee
 - Insurance etc.

Example 1: The following figures have been extracted from a trader's records in respect of salaries for July.

Basic Pay	Rs. 16,300	Income tax	Rs. 1,600
Employees' pension contributions	700	Employer's pension contributions	700
House Rent	3,500	Medical Allowance	2,200
Insurance	400	Car Advance Deduction	1,800
Compensatory Allowance	800	Other Allowances	3,000

Requirement (A): What is the total amount the trader will have to pay?

Requirement (B): What is the net pay received by employee?

9.3 Payroll Entries

- ❖ There are three entries have been passed in this regard:
 - Payroll Preparation
 - Payroll Distribution
 - Payroll Payment

Example 2: Prepare journal entries to record payroll preparation, distribution and payment as on June 30th, 2011

Direct Labor	Rs. 15,000
Indirect Labor	10,000
Sales Salaries	7,000
Administrative Salaries	8,000
Total	Rs. 40,000

Deductions:

Income tax	Rs. 4,000
Group insurance	1,000

Solution (a) Payroll Preparation

General Journal					
Date		Account Titles and Explanation	Ref	Amount (Rs)	
				Debit	Credit
2011					
June	30				
Total				Rs. 40,000	Rs. 40,000

Solution (b) Payroll Distribution

General Journal					
Date		Account Titles and Explanation	Ref	Amount (Rs)	
				Debit	Credit
2011					
June	30				
Total				Rs. 40,000	Rs. 40,000

Solution (c) Payroll Payment

General Journal					
Date		Account Titles and Explanation	Ref	Amount (Rs)	
				Debit	Credit
2011					
June	30				
		Total		Rs. 35,000	Rs. 35,000

Further Study and Practice of Labor Costing

Video Lecture (Labor Costing)

<https://youtu.be/0CfJIPJ751E>

Workbook Solution (Labor Costing)

<https://www.accountancyknowledge.com/labor-cost/>

Practice MCQs (Labor Costing)

<https://www.accountancyknowledge.com/labor-cost-mcqs/>

LABOR COSTING (II)

10.1 Payroll Systems

- Different payroll systems have been devised for meeting the requirements of both employees and employers
- Usually the employer makes a specified monetary payment to workers for a specified work or job done
- The specified monetary payment could either be related to a particular hours of attendance or to the quantity of work
 - ❖ Time Rate Based Premium Plan
 - ❖ Piece Rate Based Premium Plan

10.1 Time Based Premium Plan

- ✓ Under this system, wages to a worker are paid on time basis irrespective of the quantity of production
- ✓ The wage is measured on the basis of unit of time i.e. hourly, daily, weekly or monthly
- ✓ Some of the important time based incentive wage plans are briefly discussed below with practical examples

10.1.1 Halsey Premium Plan:

- ✓ Under this system, a standard time is fixed for each job or operation
- ✓ Time rate is guaranteed to a worker, if he completes the job within standard time or more than the standard time, he is paid standard rate
- ✓ But if the Job is completed in less than the standard time fixed for the job, he is given wages for the actual hours taken plus bonus equal to one half of the wage of the time saved

Halsey Premium Plan = Normal wages + Premium

Or

$$\text{Halsey Premium Plan} = (\text{Time worked} * \text{wage rate}) + (\frac{1}{2} \text{ Time saved} * \text{wage rate})$$

Example 1: Following are data related to payroll are extracted from the books of Ali Khan Ltd:

Wage rate per hour	Rs. 50	Time allowed for the job	10 hours
Time taken	6 hours		

Required: (a) Calculate the Gross wages using Halsey premium plan (b) Find out Effective Rate of Earnings

Solution:

$$\text{Halsey Premium Plan} = (\text{Time worked} * \text{wage rate}) + (\frac{1}{2} \text{ Time saved} * \text{wage rate})$$

10.1.2 Halsey-Weir Premium Plan:

- Under this method, other things being the same as Halsey Plan, the rate of premium usually applied is 1/3 of the wage of the time saved

$$\begin{aligned} \text{Halsey-Weir Premium Plan} &= \text{Normal wages} + \text{Premium} \\ \text{Or} \\ \text{Halsey-Weir Premium Plan} &= (\text{Time worked} * \text{wage rate}) + (1/3 \text{ Time saved} * \text{wage rate}) \end{aligned}$$

Example 2: Following are data related to payroll are extracted from the books of Ali Khan Ltd:

Wage rate per hour	Rs. 50	Time allowed for the job	10 hours
Time taken	6 hours		

Required: (a) Calculate the Gross wages using Halsey-Weir Premium Plan (b) Find out Effective Rate of Earnings

Solution:

$$\text{Halsey-Weir Premium Plan} = (\text{Time worked} * \text{wage rate}) + (1/3 \text{ Time saved} * \text{wage rate})$$

10.1.3 Rowan Premium Plan:

- ❖ This system is similar to the above two plans. The worker is guaranteed at ordinary rate of wages and premium or bonus is paid in respect of time saved
- ❖ Under the Rowan system the premium rate is calculated as the proportion of time saved to the standard time allowed
- ❖ Premium Rate = $\frac{\text{Time allowed} - \text{Actual time taken}}{\text{Time allowed}} * 100$
- ❖ In order to get premium amount premium rate is multiplied by normal wages

$$\begin{aligned} \text{Rowan Premium Plan} &= \text{Normal wages} + \text{Premium} \\ \text{Or} \\ \text{Rowan Premium Plan} &= (\text{Time worked} * \text{wage rate}) + (\text{Premium Rate} * \text{Normal Wages}) \\ \\ \text{Premium Rate} &= \frac{\text{Time allowed} - \text{Actual time taken}}{\text{Time allowed}} * 100 \end{aligned}$$

Solution: Halsey Premium Plan

Solution: Halsey-Wire Premium Plan

Solution: Rowan Premium Plan

Comparative Wage Sheet

Premium Plans	Normal Wages	Premium	Gross Wage	ERE
Halsey Premium Plan				
Halsey-weir Premium Plan				
Rowan Premium Plan				

10.1.2 Piece Rate Based Premium Plan

- ✓ Under this method of remuneration a worker is paid on the basis of production and not time taken by him to perform the work
- ✓ Piecework is where a fixed amount is paid per unit of output achieved irrespective of the time spend
- ✓ This is one of the simplest and most commonly used of all incentive schemes. The rate is expressed in terms of certain sum of money for every unit produced, e.g. Rs 2 etc.

10.1.2.1 Straight Piece Rate:

- Wages are paid in this system in accordance with the output of production. This is independent of time spent on the job

$$\text{Straight Piece Rate} = \text{Unit Produced} * \text{Rate Per Unit}$$

Example 5: If a worker produces 25 pieces per day and he is paid at the rate of Rs. 20 per piece, what will be the total wages per day?

Solution:

$$\text{Straight Piece Rate} = \text{Unit Produced} * \text{Rate Per Unit}$$

10.1.2.2 Piece-rate with guarantee:

- A piece rate with guarantee operates to give the employee some security if the employee does not provide enough work in particular period
- If an employee’s earning for the amount of units produced in the periods are lower than guaranteed amount, then the guaranteed amount is paid

Example 6: Mr. Mohsin Khan is paid Rs. 3.00 for every unit that he produces but he has a guaranteed wage of Rs. 28.00 per eight-hour a day. In a particular week he produces the following number of units:

Monday 12 units	Tuesday 14 units
Wednesday 9 unit	Thursday 18 units
Friday 8 units	

Calculate Mohsin’s wages of this week?

Solution:

Week days	Calculation	Wages
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Total		Rs. 188

10.12.3 Differential piece rates:

- There are various differential piece rate plans. The differential piece rate plans aim at maximum production by giving an additional incentive to increase output just at the stage at which the worker would otherwise begin to feel that further efforts was not worthwhile
- These schemes are devised in such a manner that with the increase in efficiency of a worker his wages are automatically increased. Some of the differential schemes are:
 - ✓ Taylor Differential Piece Rate Plan
 - ✓ Merrick Differential Piece Rate Plan

5.4.2.3.1 Taylor differential piece rate system:

- This system was originated by W.F. Taylor, the father of scientific management
- It is based on the assumption that the degree of efficiency varies from worker to worker and hence the worker must be paid according to their degree of efficiency
- Under this system two piece rates are fixed
- One lower rate applicable to worker whose production is below standard and another higher rate is applicable to a worker whose production is at or above the standard

Example 7: From the following particulars, calculate the earnings of workers under Taylor's Differential Piece Rate Plan.

Standard production per day	27 pieces
Normal rate per piece	80
A produces	25 units
B produces	35 units

Differential to be applied 80% of piece rate below standard. 120% of piece rate at or above standard

Solution:

A

Per unit Rate =

Gross wages =

B

Per unit Rate =

Gross wages =

10.1.2.3.2 Merrick differential piece rate system

- ❖ Merrick Differential system is a modification of the Taylor's system
- ❖ Uses three rates instead of two. The three rates are as under:
- ❖ Efficiency upto 80% Normal Piece rate applicable
- ❖ Efficiency upto 100% 10% above normal rate
- ❖ Efficiency above 100% 20% above normal rate

Example 8: From the following particulars calculate the total earnings of the three workers who are paid wages under the Merrick Differential System.

Normal piece rate (upto 80%)	Rs. 5 per unit
Standard Production	40 units per week
Output of the workers for the week:	
A	32 units
B	37 units
C	42 units

Solution:

A

Efficiency Level =

Gross wages =

B

Efficiency Level =

Per unit Rate =

Gross wages =

C

Efficiency Level =

Per unit Rate =

Gross wages =

OVERHEAD (I)

- ✓ Factory overhead is the costs incurred during the manufacturing process, not including the costs of direct labor, direct materials and direct expenses
- ✓ Costs that cannot practically be assigned directly to the production or sale of a particular product. In accounting terms, such costs are not directly identifiable with a specific cost objective
- ✓ Costs of minor amount may be treated as indirect costs
- ✓ Overheads are to be classified on the basis of functions to which overheads are related
 - Production overheads
 - Administrative overheads
 - Selling overheads
 - Distribution overheads
- ✓ Overheads may also be classified on the basis of behavior such as variable overheads, semi-variable overheads and fixed overheads
- ✓ Overheads comprise of indirect materials, indirect employee costs and indirect expenses which are not direct expenses which are not directly identifiable or allocable to a cost object in a economically feasible way
- ✓ Manufacturing overhead consists of three primary costs: indirect materials, indirect labor, and indirect expenses

11.1 Indirect Material

- ✓ Indirect materials include factory supplies such as sandpaper to smooth rough edges, blades to cut materials, oil for the production machines & lubricants and other factory-related materials and supplies that do not directly become part of a product
- ✓ Indirect material costs differ from direct materials in that indirect costs are not traceable to a particular product

11.2 Indirect Labor

- ❖ Indirect labor includes factory supervisor salaries, factory maintenance workers salaries or wages, production supervisor salaries, quality assurance salaries, materials management salaries, employee benefits, materials handling, overtime premium, plant security, Workers' Compensation Insurance and other costs for factory-related workers who do not directly contribute to producing a particular product
- ❖ Indirect labor costs differ from direct labor in that indirect costs are not traceable to a particular product

11.3 Indirect Expenses

- Some examples are factory rent, factory insurance, factory building and equipment depreciation, factory utilities, Equipment setup costs, factory small tools and factory, defective work, fuel, heat and light, power, property tax, Telephone/Fax, Water and equipment maintenance

Example 1: A Company makes two products X and Y. During a given period, the company makes 2,000 units of each product. The direct cost of product X is Rs. 120,000 and direct cost of Product Y is Rs. 100,000. Overhead cost for the period is Rs. 200,000.

If we want to establish a cost for Product X and Product Y, the direct costs of each product are easily established, but what about the Overhead? Should each product be given a share of the overhead cost? If the overhead cost are to be divided between the two products, on what basis should the total cost be shared?

11.4 Accounting Treatment for Overheads (Absorption Costing)

- ❖ The product, services or activities are charged with a fair share of indirect cost
- ❖ There are four-step process involved in charging overhead cost to product are services
- ❖ Overhead Allocation, Overhead Apportionment, Overhead Re-Appportionment and Overhead absorption Rate also called Overhead Recovery

11.4.1 Overhead Allocation

- ✚ Overhead allocation is first of the three stages in establishing a full cost for a product or services
- ✚ Overhead allocation is the process of charging a whole item of cost to a cost centre
- ✚ Cost Centre is defined as to a unit or organization for which costs are accumulated or computed
- ✚ In other words, cost centre is area, machine, or person to whom direct and indirect costs are allocated
- ✚ Factory overhead costs are incurred in three main centers:
 - Production centers costs arising in production departments such as the costs of fuel, indirect material, depreciation and supervision
 - Service centers the cost of operating support departments or sections within the factory, for example, the costs of materials handling, production control etc.
 - General costs centers general production overhead such as factory rent/taxes, heating and lighting and canteen
- ✚ An item of expenses which can be directly related to a cost centre is to be allocation to the cost centre. For example , depreciation of a particular machine should be allocated to a particular cost centre if the machine is directly attached to the cost centre
- ✚ When factory overhead expenses are not identified with a specific product, they are charged to product by a process of overhead allocation
- ✚ Allocations may be made for each item of expense incurred and the allocations made at the end of the accounting period
- ✚ The purpose of cost accounting is to provide information to the management. Management need to know cost per unit as a basis for decision making

Example 2: A manufacturing business operates with two production departments P and Q and a department S. It manufactures soup and shampoo. It incurs the following costs in a given period.

Indirect labor cost in department S	Rs. 6,500	Direct labor cost in department P	Rs. 4,700
Cost of supervision in department Q	2,100	Direct material cost in department P	10,300
Lighting and heating	900	Machine repair cost, department Q	800
Indirect material in department S	1,100	Depreciation of machinery, department S	700
Indirect material consumed by department P	500	Cost of works canteen	1,500

Requirement: Allocate these costs as overhead cost to the following cost centres:

Production Cost Centre (P), Production Cost Centre (Q), Service Cost Centre (S) and General Cost Centre (G)

Solution:

Overhead Allocation

Description	Cost Centres			
	P	Q	S	G
Total	500	2,900	8,300	2,400

11.4.2 Overhead Apportionment

- Once overhead costs have been allocated to cost centres, general overhead must be shared out or apportioned. This may be to production or services cost centres
- Overhead apportionment is the process of sharing out overhead costs on fair basis
- Overheads are to be apportionment to different cost centres based on following two principle
 - *Cause and Effect:* Cause is the process or operation or activity and effect is the incurrence of cost
 - *Benefits received:* Overheads are to be apportioned to the various cost centres in proportion to the benefits received by them

Example 3: A general cost in a manufacturing company is factory rental. Annual rental costs are Rs. 80,000. How this cost should be apportioned between production cost centres and services cost centres? Rental costs are usually apportioned between cost centres on the basis of the floor space taken up by each centre. Suppose that three cost centres have floor space of 50,000 square meters; Production cost centre (A) has 10,000 square meters, Production cost centre (B) has 15,000 square meters and Service cost centre (C) has 25,000 square meters.

Solution:

Production Cost Centre (A) =
 Production Cost Centre (B) =
 Service Cost Centre (C) =

11.4.2.1 Bases for Overhead Apportionment:

- ✘ Basis of apportionment must be rational to distribute overheads
- ✘ Once the base is selected the same is to be followed consistently
- ✘ However, change in basis for apportionment can be adopted only when it is considered necessary due to change in circumstances like change in technology, degree of mechanization product mix etc.

Common Bases for Apportionment of Overheads

Costs	Basis for Apportionment
Building Maintenance	Floor space
Inspection and Packing	Production volume
Asset Maintenance	Book value of an asset
Heating and Lighting	Floor space
Oil for Machine Lubrication	Machine hours or number of machine
Supervision or Employee Benefits	Number of workers
Canteen Costs	Number of workers
Petrol for Vehicles	Number of vehicles or mileage of vehicles
Rent and Electricity	Floor space
Cost of material, Store and Warehouse	Number of material requisitions
Depreciation of assets or Insurance	Book value of an asset
Power or Fuel	Machine hours
Labor welfare cost	Number of employees

Example 6.4: An organization has two production department A and B and two services departments, Stores and canteen.

The general overhead costs for the organization in total are as follows:

Rent	Rs. 32,000	Building maintenances costs	Rs. 5,000
Machinery insurance	2,400	Machinery depreciation	11,000
Machinery running expenses	6,000	Power	7,000

There are also specific costs that have already been allocated to each cost centre as follows:

Department A	Rs. 5,000	Department B	Rs. 4,000
Stores	1,000	Canteen	2,000

The following information about the various cost centres is also available:

Basis for Apportionment	Total	Dept. A	Dept. B	Stores	Canteen
Floor Space (sq ft)	30,000	15,000	8,000	5,000	2,000
Power usage	100%	45%	40%	5%	10%
Book value of machine	250,000	140,000	110,000	-	-
Machine hours	80,000	50,000	30,000	-	-
Book value of equipment	20,000	-	-	5	15
Number of employees	40	20	15	3	2
Value of stores requisitions	150,000	100,000	50,000	-	-

Required: Allocate and apportioned the cost to the four departments by making Overhead Analysis Sheet?

Further Study and Practice of Overhead

Video Lecture (Overhead)

Workbook Solution (Overhead)

<https://www.accountancyknowledge.com/factory-overhead/>

Practice MCQs (Overhead)

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OVERHEAD (II)

Difference between Cost Allocation and Cost Apportionment

Cost Allocation	Cost Apportionment
1. Deals with whole items of costs	1. Deals with proportions of items of cost
2. Is a direct Process	2. Is an Indirect Process for which suitable bases are to be selected
3. Cost allocation depends upon the nature of cost	3. Apportionment does not depend upon the nature of cost

12.1 Re-Appportionment

- Organizations may have service departments (canteen, maintenance and administration) which cannot be related to any income producing activity
- To find the full cost of a cost unit these department costs should also be absorbed into the unit cost
- Therefore, service departments must be apportioned to the various departments producing the products or services
- There are three methods are used for re-apportionment

12.1.1 Direct Distribution Method

- ♣ In this method services cost centres will be re-apportioned to production cost centre only
- ♣ In this situation where service cost centres do not service each other (Non-Reciprocal Apportionment)

Example 1: Using the information produced in the previous example, the allocated and apportioned overhead costs are:

Description	Total	Production Cost Centres		Service Cost Centres	
		Dept. A	Dept. B	Stores	Canteen
Total Allocation and Apportionment	Rs. 75,400	Rs. 37,904	Rs. 24,813	7,517	5,166

The apportionment of the stores cost centre will be on the basis of the value of requisitions by each production cost centre. The apportionment of the canteen costs should be on the basis of the number of employees in production dept. A and B

Basis for Apportionment	Total	Dept. A	Dept. B	Stores	Canteen
Number of employees	40	20	15	3	2
Value of stores requisitions	150,000	100,000	50,000	-	-

Requirement: Show how the service cost centre costs should be re-apportioned and the resulting total overhead costs of each production cost centre assuming that store cost centre does not work for canteen and canteen does not work for store cost centre?

Overhead Analysis Sheet

Description	Total	Production Cost Centres		Service Cost Centres	
		Dept. A	Dept. B	Stores	Canteen
Total Overhead	Rs. 75,400	Rs. 45,867	Rs. 29,533	0	0

12.1.2 Step-Down Method

- ⊗ Some organizations use the step-down method, also called the sequential or repeated allocation method
- ⊗ Which allocates services-department costs to other services departments and to production departments in a sequential manner that partially recognizes the mutual services provided among all service depts. (Reciprocal Apportionment)
- ⊗ Distributes service department costs regressively to other service departments and then to production departments.

Example 2: A company has three production departments and two service departments. Distribution summary of overheads is as follows:

Production Department		Service Departments	
A	Rs.3,000	D	Rs.234
B	Rs.2,000	E	Rs.300
C	Rs.1,000		

The expenses of service departments are charged on a percentage basis which is as follows:

Departments	Production Department			Service Departments	
	A	B	C	D	E
D	20%	40%	30%	-	10%
E	40%	20%	20%	20%	-

Requirement: Find out the total overheads of production departments by step-down method?

Overhead Analysis Sheet

Items	Production Cost Centre			Service Cost Centre	
	A	B	C	D	E
Total	Rs. 3,191	Rs. 2,187	Rs. 1,156	0	0

12.1.3 Algebraic Distribution Method

- ♣ It is also reciprocal apportionment using equation
- ♣ Distributes costs by simultaneous equations recognizing the relationship of services rendered by departments to each other

Example 3: A company has three production departments and two service departments. Distribution summary of overheads is as follows:

Production Department		Service Departments	
A	Rs.3,000	D	Rs.234
B	Rs.2,000	E	Rs.300
C	Rs.1,000		

The expenses of service departments are charged on a percentage basis which is as follows:

Departments	Production Department			Service Departments	
	A	B	C	D	E
D	20%	40%	30%	-	10%
E	40%	20%	20%	20%	-

Requirement: Find out the total overheads of production departments by Algebraic Distribution Method?

Let x denotes total overhead of service department D

y denotes total overhead of service department E

Re-arrange the equation

To solve the equations multiply by 10 to remove decimals

Multiplying (6) equation by 10 and solving

Putting the value of y in equation (1)

$$x = 300$$

Overhead Analysis Sheet

Items	Production Cost Centre		
	A	B	C
Total	3192	2186	1156

12.1.4 Overhead absorption Rate

- ✘ An absorption rate is the rate at which overheads are added to costs
- ✘ Production overhead costs are absorbed into product costs on a particular bases selected by the organization
- ✘ The calculation of an overhead absorption rate requires two elements i.e. the total overhead attributable to a cost centre and the absorption base
- ✘ The absorption bases should be appropriate. The most common bases of absorption are:
 - ❖ Percentage of direct material cost
 - ❖ Percentage of direct labor cost
 - ❖ Percentage of prime cost
 - ❖ Rate per unit produced
 - ❖ Rate per labor hour
 - ❖ Rate per machine hour
 - ❖

$$\text{Overhead Absorption Rate} = \frac{\text{Estimated Total Factory Overhead}}{\text{Estimated Base}} * 100$$

- ✘ Once an Overhead absorption rate has been calculated, the amount of overhead absorption can be calculated as follow:
- ✘ Overhead absorption = Actual Activity Level * Overhead Absorption Rate

Example 4: The Company estimated that it would incur Rs. 320,000 in manufacturing overhead costs and would work 40,000 direct labor-hours. What is the company's Overhead Absorption rate?

Solution:

12.2 Product and Period Costs

- ♣ All manufacturing costs are product costs i.e. direct material, direct labor and factory overhead costs
- ♣ Period costs are not associated with the production of goods. Some examples of period costs are:
 - Selling, advertising, marketing costs
 - Delivery of products to customers (e.g., freight-out, transportation-out, delivery expense)
 - General and administrative costs
 - Corporate occupancy such as corporate rent, corporate insurance, corporate utilities, corporate depreciation

Further Study and Practice of Overhead

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JOB ORDER COSTING

- Product costing plays a critical role in the manufacturing environment and is also a significant factor in service industries
- A good costing should be flexible and reliable. It provides information for a variety of purposes and can be used to answer a variety of questions
- In general, the cost accounting system is used to satisfy the needs for cost accumulation, cost measurement, and cost assignment
- Cost accumulation refers to the recognition and recording of costs. The cost accountant needs to develop source documents, which keep track of costs as they occur
- A source document describes a transaction. Data from these source documents can then be recorded in a database. Well-designed source documents can supply information in a flexible manner
- Cost measurement refers to classifying costs and consists of determining the amounts of direct materials, direct labor, and overhead. Two common methods of cost measurement in production are (1) Actual costing and (2) Normal costing
- An actual costing system uses actual costs for direct materials, direct labor, and overhead to determine unit cost
- A normal costing system uses actual costs for direct materials and direct labor but measures overhead costs on a predetermined basis
- Cost assignment refers to distributing costs to units of product manufactured or units of service delivered.
- There are two Product Cost systems used to assign costs to products or services:
 - ⊗ Job-Order Costing
 - ⊗ Process Costing

13.1 Job-Order Costing

- ♣ In a Job-Order Costing System, costs are accumulated by job
- ♣ Firms operating in job-order industries produce a wide variety of products or jobs that are usually quite different from each other
- ♣ Customized or built-to-order products fit into this category, as do services that vary from customer to customer
- ♣ The key feature of job-order costing is that the cost of one job differs from another job and must be monitored separately
- ♣ Once any given job is completed, the unit cost can be computed by dividing total job costs by the number of units produced on that job
- ♣ It is important to understand that the different documents used in a job-order costing system
- ♣ The document that identifies each job and accumulates its manufacturing costs in the job-order cost sheet
- ♣ The job-order cost sheet reflects direct materials, direct labor, and overhead costs for the job

13.1.1 Materials Requisitions

- ❖ The cost of direct materials is traced to each job through the use of a materials requisition form
- ❖ When direct materials are issued to production, the materials requisition form identifies the job, the quantity and type of direct materials, and the cost of direct materials

13.1.2 Job Time Sheet

- ✘ Job time sheet or ticket are the source documents used to assign direct labor costs to jobs
- ✘ When a direct laborer works on a job, he or she fills out a time ticket indicating the time spent on the job, along with the wage rate

13.1.3 Overhead Application

- ✓ Overhead is assigned to jobs using predetermined rates or Overhead Absorption Rate (OAR)
- ✓ If the rate is based on direct labor hours, then the predetermined rate and the information from the time tickets are used to assign overhead to jobs

<i>Type of cost</i>	<i>Name of source document</i>	<i>Description of source document</i>
Direct materials	Materials requisition	Authorizes materials to be taken from the storeroom for use on a job
Direct labor	Time Sheet	A form filled out by employees that reports how much time they spent on each job
Factory overhead	Accountant's working	Factory overhead costs are not allocated to each job based on actual costs. They are allocated based on an estimate called a predetermined overhead rate

Example # 13.1: A Furniture Mart received an order to manufacture furniture for a school the order was assigned a job code FS-6. FS-6 job was priced at Rs. 400,000 and selling & admin cost allocated to the job was 10% of selling price.

Material Requisition

Date	Requisition #	Cost
March 05	978	25,000
March 15	1,060	50,000
March 25	1,100	40,000
Total		Rs. 115,000

Job Time Sheet

Date	Hours	Rate	Cost
March 05	400	50	20,000
March 15	400	50	20,000
March 25	200	50	10,000
Total	1,000	-	50,000

FOH cost is applied at Rs. 180 per direct labor hour (OAR)

Requirement: Make a Job Order Cost Sheet for FS-6

Solution:

Job Order Cost Sheet

Description	FS-6

Overhead Amount = Actual Activity Level * Overhead Absorption Rate

13.2 Job Pricing

- ✘ Since each job is different , there will be no set price for each job
- ✘ Pricing is based on Cost-Plus Pricing also known as markup pricing
- ✘ In this method first calculates the cost of the product and then adds a proportion markup

Example # 13.2: A company carries out small building work for domestic customers. A customer asked the company to quote a price for building an extension at the back of his house. The company’s estimator has come up with the following estimated costs:

Direct Material	Rs. 2,500	Direct Labor	Rs. 4,000
Direct Expenses	Rs. 500	OAR	100% of Direct Labor Cost
Office Overheads	20% of Production Cost	Profit Mark-up	25% of Total Cost

Solution:

Job Order Cost Sheet

Description	Amount

13.2 Accounting Entries for Job Order Costing

⊗ Following are accounting procedure used for job order costing

Example # 13.3: Pass journal entries for the year for Company appear below:

Jan 3, 2019. Raw materials were purchased on account for Rs. 200,000

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	3				

Jan 6, 2019. Raw materials that cost Rs. 160,000 were issued from the storeroom for use in production. Of this total, Rs. 136,000 was for direct materials and Rs. 24,000 for indirect materials

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	6				

Jan 9, 2019. The following costs were incurred for employee services: direct labor, Rs. 200,000; indirect labor, Rs. 85,000; selling and administrative wages and salaries, Rs. 90,000

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	9				

Jan 12, 2019. Supplies costs of Rs. 40,000 were incurred in the factory

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	12				

Jan 15, 2019. Prepaid insurance of Rs. 20,000 expired during the year (80% related to factory operations and 20% to selling and admin)

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	15				

Jan 18, 2019. Advertising costs of Rs. 10,000 were paid during the year.

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	18				

Jan 20, 2019. Depreciation was Rs. 145,000 for the year on factory assets and Rs. 15,000 on selling and admin assets

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	15				

Jan 22, 2019. Manufacturing overhead was applied to jobs. The company’s predetermined overhead rate was based on the following estimates: manufacturing overhead, Rs. 315,000; direct labor cost, Rs. 210,000. Since the total direct labor cost incurred was Rs. 200,000

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	22				

Jan 23, 2019. Goods that cost Rs. 650,000 to manufacture according to their job cost sheets were completed and transferred to the finished goods warehouse

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	22				

Jan 25, 2019. Sales (all on credit) were Rs. 900,000

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	25				

Jan 25, 2019. The goods that were sold had cost Rs. 600,000 to manufacture according to their job cost sheets.

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2019					
Jan	25				

Example # 13.4: The following information related to XYZ Company

Direct Materials:

House #1	Rs. 90,000
House #2	100,000
House #3	<u>30,000</u>
Total Direct Materials	<u>Rs. 220,000</u>

Direct Labor:

House #1	Rs. 65,000
House #2	70,000
House #3	<u>15,000</u>
Total Direct Labor	<u>Rs. 150,000</u>

Overhead is applied at 50 percent of direct labor costs.

PROCESS COSTING (I)

- Process costing is a method of costing used to ascertain the cost of production of each process, operation or stage of manufacture where processes are carried in having one or more of the following features
 - The output of one process becomes the input to the next process
 - The continuous nature of Homogeneous production
 - There is often a loss in process due to spoilage, shrinkage, wastage so on
 - Output from production may be a single product, but there may also be a by-product (or byproducts) and/or joint products
- Process costing is a costing method used where it is not possible to identify separate units of production, or jobs, usually because of the continuous nature of the production processes
- It is common to identify process costing with continuous production such as the following
 - ⊗ Oil refining
 - ⊗ Foods and drinks
 - ⊗ Paper
 - ⊗ Chemicals
- However, there are some important differences between job order and processing costing as described below

Job Order Costing	Process Costing
Each job is different	All products are identical
Costs are accumulated by job	Costs are accumulated by department
Costs are captured on a Job Cost Sheet	Costs are accumulated on a Cost of Production Report
Unit costs are computed by job	Unit costs are computed by department

14.1 Cost of Production Report

- In process costing Cost of Production Report also called Process Cost Sheet is the key document
- At the end of costing period, generally a month, a Cost of Production Report is prepared
- It summarizes the data of quantity produced and cost incurred by each producing department
- It also serves as a source document for passing accounting entries at the end of costing period
- A cost of production report shows:
 - ♣ Total unit costs transferred to it from a preceding department
 - ♣ Materials, labor, and factory overhead added by the department
 - ♣ Unit cost added by the department
 - ♣ Total and unit costs accumulated to the end of operations in the department.
 - ♣ The cost of the beginning and ending work in process inventories
 - ♣ Cost transferred to a succeeding department or to a finished goods storeroom
- Cost of production report is divided into five sections. Each section is meant to provide specific information. A brief description of these sections is presented below:

1. Quantity Schedule
2. Cost Charged to the Department
3. Equivalent units produced
4. Cost Per Unit
5. Cost Accounted for as Follows

Example # 14.1: A manufacturing company makes a single production in one department; you are required to make a Cost of Production Report (CPR) from the following data:

<i>Cost Data</i>		<i>Production Data</i>	
Material Cost	Rs. 24,500	Unit started for production	50,000 Units
Labor Cost	29,450	Unit completed	45,000
Factory overhead Cost	28,500	Unit in process	5,000

At the end of month Raw material 100% completed and Labor and FOH 50%.

14.1.1 Quantity Schedule

- o The first section Quantity Schedule contains input and output data in terms of quantities. The information is presented in the following order.

Quantity Schedule:

Units started in process		50,000
		=====
Units completed and transferred to next department	45,000	
Units still in process (All materials – 50% Labor and FOH)	5,000	
		50,000
		=====

14.1.2 Cost Charged to the Department

- + This section contains direct materials, direct labor and factory overhead added by the department

Cost Charged to the Department:

Materials	Rs. 24,500
Labor	29,450
Factory Overhead (FOH)	28,500

<i>Cost Charged to the Department</i>	<i>Rs. 82,450</i>
	=====

14.1.3 Equivalent Units Produced

- ❖ In order to arrive at cost per unit of output, total of each cost element is divided by the number of units produced
- ❖ For this purpose, where at the end of costing period, there are some partially completed units in process, these units must be stated in terms of equivalent completed units
- ❖ These equivalent units are added to units completed by the department to arrive at equivalent production. Then total cost is divided by this equivalent production figure to calculate unit cost

Equivalent Units Produced:

Materials (45,000) + (5,000*100%)	50,000 Units
Labor (45,000) + (5,000*50%)	47,500 Units
Factory Overhead (45,000) + (5,000*50%)	47,500 Units
	=====

14.1.4 Cost per Unit

- The unit cost of the equivalent units for a given period is calculated as follows:

$$\text{Unit Cost} = \frac{\text{Cost of the period}}{\text{Equivalent units of the period}}$$

Cost per Unit:

Materials (24,500 / 50,000)	0.49 per Units
Labor (29,450 / 47,500)	0.62 per Units
Factory Overhead (28,200 / 47,500)	0.60 per Unit
<i>Total per unit cost</i>	<i>1.71 per Unit</i>

14.1.5 Cost Accounted for as Follows

- This section shows total cost for which the departments are accountable

Cost Accounted for as Follows:

Transferred to next department (45,000 × Rs. 1.71)		Rs. 76,950
Work in process - ending inventory:		
Materials (5,000 × 100% × Rs. 0.49)	Rs. 2,450	
Labor (5,000 × 50% × Rs. 0.62)	1,550	
Factory Overhead (5,000 × 50% × Rs. 0.60)	1,500	5,500

Total cost accounted for		Rs. 82,450
		=====

14.2 One Department Case

- This case assume that company has a one department

Example # 14.2: Mini Soap Manufacturing units started to incurring cost in first department for 1,000 soaps. At the end of the week 600 soaps were completed and 400 incomplete. 100% of direct material had been incurred. But 75% conversion cost was yet incurred on the incomplete work. Detail of cost incurred by the department as follows:

Direct Material	Rs. 500
Direct Labor	Rs. 225
FOH	Rs.135

Required: Cost of Production Report at the end of March, 2012.

Solution:

Mini Soap Manufacturing
Cost of Production Report (Department I)
For year ended, March 2012

1. Quantity Schedule:	Units	Units
Units started in process		
Units completed and transferred store room		
Units still in process (All materials – 75% conversion costs)		
2. Cost Charged To the Department:	Amount	Amount
Material		
Direct Labor		
FOH		
<i>Cost Charged to the Department</i>		Rs. 860
3. Equivalent Units Produced:	Units	Units
Material (600) + (400 × 100%)		
Labor (600) + (400 × 75%)		
FOH (600) + (400 × 75%)		
4. Cost per Unit:	Units	Units
Material (500/1,000)		
Labor (225 / 900)		
FOH (135 / 900)		
<i>Cost per Unit</i>		<i>0.9 per unit</i>
5. Cost Accounted for as Follows:	Amount	Amount
Transferred to finished goods store (600 × Rs. 0.9)		
Work in process - ending inventory:		
Material (400 × 100% × 0.5)		
Labor (400 × 75% × 0.25)		
FOH (400 × 75% × 0.15)		
<i>Cost Accounted for</i>		Rs. 860

Example # 14.3: Heera Manufacturing Company manufactures a product. Production made and manufacturing costs incurred in the first department during the month of October, 2011 are given below:

10,000 units were started in process out of which 9,400 units were transferred to next department and remaining 600 units were 1/2 complete as to materials, labor and overhead. Direct materials Rs. 19,400, direct labor Rs. 24,250 and factory overhead Rs. 4,850 was charged to production.

Required: Cost of production report for the month.

Solution:

Heera Manufacturing Company
Cost of Production Report (Department I)
For year ended, October 2011

1. Quantity Schedule:	Units	Units
Units started in process		
Units completed and transferred to warehouse		
Units still in process		
<hr/>		
2. Cost Charged To the Department:	Amount	Amount
Material		
Direct Labor		
FOH		
<i>Cost Charged to the Department</i>		Rs. 48,500
<hr/>		
3. Equivalent Units Produced:	Units	Units
Material		
Labor		
FOH		
<hr/>		
4. Cost per Unit:	Units	Units
Material		
Labor		
FOH		
<i>Cost per Unit</i>		<i>5.0 per unit</i>
<hr/>		

5. Cost Accounted for as Follows:	Amount	Amount
Transferred to warehouse		
Work in process - ending inventory:		
Material		
Labor		
FOH		
<i>Cost Accounted for</i>		Rs. 48,500

Example # 14.4: Production and cost data of first production department of Excellent Manufacturing Company for the month of January, 2012 are as follow:

Units started in process were 5,000. Units completed and transferred to second department were 4,500. Remaining units were in process estimated to be 50%, 40%, 60% completed as to materials, labor and factory overhead respectively. Costs of materials, labor and overhead were Rs. 49,875, Rs. 59,925 and Rs. 40,032 respectively

Required: Cost of production report

Solution:

Excellent Manufacturing Company
Cost of Production Report (Department I)
For year ended, January 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
3. Equivalent Units Produced:	Units	Units

Further Study and Practice of Process Costing

Video Lecture (Process Costing)

<https://youtu.be/g0CYESYzoDk>

Workbook Solution (Process Costing)

<https://www.accountancyknowledge.com/process-costing/>

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PROCESS COSTING (II)

More than One Department Case

- ♣ In this case it is assumed that a company has more than one department for processing

Example # 1: Mini Soap Manufacturing units started incurring cost in the first department for 1,000 soaps. At the end of the week 600 soaps were completed and 400 incomplete. 100% of direct material had been incurred. But 75% conversion cost was yet incurred on the incomplete work. Detail of cost incurred by the department I as follows:

Direct Material	Rs. 500
Direct Labor	Rs. 225
FOH	Rs. 135

Mini Soap Manufacturing unit completed and transferred out 600 soaps to department II. In department II 500 soaps completed and transferred out. Units which were still in process 100 (100% material, Conversion cost 60%). Cost received from preceding department Rs. 540

Following costs were incurred by department II

Direct Material	Rs. 150
Direct Labor	Rs. 112
FOH	Rs. 168

Required: Cost of Production Report at the end of March, 2012 for department I and II

Solution:

Mini Soap Manufacturing
Cost of Production Report (Department I)
For year ended, March 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 860</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 860</i>

Mini Soap Manufacturing
Cost of Production Report (Department II)
For year ended, March 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 970</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 970</i>

Example # 2: Nadeem manufacturing company produces products. The processing of this product is to be done in three departments known as department A, B and C. from department A the work passed sequentially through department B and C, emerging as finished product. The cost transactions of the company are shown in the following journal entries:

General Journal

Date		Account Title and Explanations	Ref	Amount (Rs)	
				Debit	Credit
2011					
Nov.	30	Work in Process-Department-A		35,000	
		Work in Process-Department-B		60,420	
		Work in Process-Department-C		29,835	
		Material			125,255
	30	Work in Process-Department-A		25,600	
		Work in Process-Department-B		18,200	
		Work in Process-Department-C		10,920	
		Payroll			54,720
	30	Work in Process-Department-A		4,800	
Work in Process-Department-B			15,400		
Work in Process-Department-C			5,720		
	Factory Overhead			25,920	
Total				Rs. 205,895	Rs. 205,895

The quantity of production statement for this period appears as follows:

Description	Dept. A	Dept. B	Dept. C
Unit put in process	35,000		
Transferred to next department/Finished goods	30,000	27,000	25,000
Work in Process (All material, 2/5 of conversion cost)	5,000		
Work in Process (50% material, 1/3 of conversion cost)		3,000	
Work in Process (25% material, 50% of conversion cost)			2,000

Requirement: Prepare cost of Production Report

Solution:

Nadeem Manufacturing Company
Cost of Production Report (Department I)
For year ended, November 2011

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 65,400</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 65,400</i>

Nadeem Manufacturing Company
Cost of Production Report (Department II)
For year ended, November 2011

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 152,520</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 152,520</i>

Nadeem Manufacturing Company
Cost of Production Report (Department III)
For year ended, November 2011

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 188,765</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 188,765</i>

Further Study and Practice of Overhead

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<https://www.youtube.com/watch?v=g0CYESYzoDk>

Workbook Solution (Process Costing)

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PROCESS COSTING (Losses)

- ♣ There is always a chance of occurrence of losses during the manufacturing process and even in the finished goods storeroom. Such losses are classified as normal loss and abnormal loss:
 - Normal Loss
 - Abnormal Loss

16.1 Normal loss

- ⊗ Occurrence of this type of loss is always expected
- ⊗ It is unavoidable loss and is inherent in the manufacturing process or its chances of happening are more likely than not
- ⊗ For example; while transporting petrol, it is normal that a little quantity will be evaporated

16.2 Abnormal loss

- ❖ It is an unexpected loss. Measures are always taken to avoid abnormal losses
- ❖ For example; security system is installed to secure loss by theft from warehouse of finished goods
- ❖ Safety measures are undertaken during manufacturing process against any loss of breakage of the output. Special care is taken during transportation of petrol to avoid its leakage
- ❖ Normal and abnormal losses are treated differently in the financial accounting and in the cost accounting as well.
- ❖ Following is the self explanatory chart that will help in understanding the difference between accounting treatment of the two different types of losses.

Treatment in Financial Accounting	
Normal loss	Abnormal loss
1. Ignored (no treatment).	1. Specifically recorded
2. Per unit cost increases.	2. Inventory per unit cost remains same
3. Normal losses are absorbed by the good units.	

Treatment in Cost Accounting	
Normal loss	Abnormal loss
1. Charged to FOH account.	1. Charged to specific WIP account.
2. Overall per unit cost increases	
3. No impact on individual job cost.	

16.3 Normal Loss in First Department

- ⊗ Loss of units during manufacturing process is, in many industries, a normal condition. This loss may be due to unavoidable spoiled work or wastage, evaporation or shrinkage etc
- ⊗ In other words, normal loss represents the lost units expected to arise even under efficient operating conditions
- ⊗ Such a loss is inherent in manufacturing operations and cannot be avoided, for this reason; cost of normal loss is absorbed by the good units produced

- ⊠ It has the effect of increasing unit cost of good output. Total cost of the department is not divided by all units processed, instead. It is divided only by the good units produced
- ⊠ In first department normal loss is shown in quantity schedule only

Example # 1: During the month of January 2012 direct materials worth Rs. 300,000 were issued to produce 26,000 units of finished product. Direct labor to process these materials totaled Rs. 110,000 and factory overhead Rs. 55,000. During the month processing of 20,000 units were completed and these units were transferred to next department, whereas, 1,000 units were lost during processing (the loss is regarded as normal). All of the direct materials had been issued for the units in process at the end of January, but Labor and FOH units were only 40% converted

Required: Cost of Production Report for Ali Ahmed Khan Company

Solution:

Ali Ahmed Khan Company
Cost of Production Report (Department I)
For year ended, January 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 465,000</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units

5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 465,000</i>

16.4 Normal Loss in Departments Subsequent to the First

- ❖ Here an adjustment in unit cost from preceding department is also necessary
- ❖ In the above example total cost of Rs. 390,000 received from department I was for 20,000 units. Out of these 20,000 units, 500 units were lost. Now total cost of Rs. 390,000 applies only to 19,500 remaining good units. This decrease in number of units will cause an increase in unit cost from preceding department
- ❖ In department 2, after the lost units have been taken into account, unit cost from department I come to Rs. 20.00 (i.e. Rs. 390,000 ÷ 19,500 units). This increase of Rs. 0.50 (i.e. Rs. 20.00 less Rs. 19.50) is called adjustment for lost units

Example # 2: ABC manufacturing company makes product in three producing departments. Cost and production data for September, 2011 are:

Cost Data	Dept. A	Dept. B	Dept. C
Material cost	12,250	---	---
Labor cost	14,570	18,655	16,200
FOH cost	14,100	16,400	9,900
Production Data	Units	Units	Units
Unit started or received from preceding Dept.	100,000	90,000	80,000
Units completed and transferred	90,000	80,000	70,000
Units in process	8,000	6,000	8,000
Normal loss	2,000	4,000	2,000
Stage of completion of closing stock			
Material	100%	---	---
Conversion cost	50%	1/3	25%

Required: Cost of Production Report

Solution:

ABC Manufacturing Company
Cost of Production Report (Department A)
For year ended, September 2011

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 40,920</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 40,920</i>

ABC Manufacturing Company
Cost of Production Report (Department B)
For year ended, September 2011

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 73,755</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 73,755</i>

ABC Manufacturing Company
Cost of Production Report (Department C)
For year ended, September 2011

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 96,300</i>
3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 96,300</i>

Example # 3: The Sibi Manufacturing Limited produces a product which passes through three departments. Raw material enters the process in department X only. There are lost units in all departments.

Production Data	(X) Units	(Y) Units	(Z) Units
Unit put in the process	90,000		
Units received from previous department	-0-	85,500	67,500
Units completed and transferred	85,500	67,500	54,000
Units in process	2,000	13,500	9,500
Units lost in process	2,500	4,500	4,000

Cost Data	Dept. X	Dept. Y	Dept. Z
Material cost	179,550	---	---
Labor cost	128,289	148,824	115,022
FOH cost	13,776	36,504	10,404

Stage of completion of closing stock

Material	100%	---	---
Conversion cost	30%	20%	40%

Required: Prepare Cost of Production Report at the end of April, 2012

Solution:

Sibi Manufacturing Limited
Cost of Production Report (Department X)
For year ended, April 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 321,615</i>

3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 321,615</i>

Sibi Manufacturing Limited
Cost of Production Report (Department Y)
For year ended, April 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 501,849</i>

3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 501,831.27</i>

Sibi Manufacturing Limited
Cost of Production Report (Department Z)
For year ended, April 2012

1. Quantity Schedule:	Units	Units
2. Cost Charged To the Department:	Amount	Amount
<i>Cost Charged to the Department</i>		<i>Rs. 567,393.725</i>

3. Equivalent Units Produced:	Units	Units
4. Cost per Unit:	Units	Units
5. Cost Accounted for as Follows:	Amount	Amount
<i>Cost Accounted for</i>		<i>Rs. 567,393.639</i>

Further Study and Practice of Overhead

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<https://www.youtube.com/watch?v=g0CYESYzoDk>

Workbook Solution (Process Costing)

<https://www.accountancyknowledge.com/process-costing/>

Practice MCQs (Process Costing)

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Practical Problems with Solutions

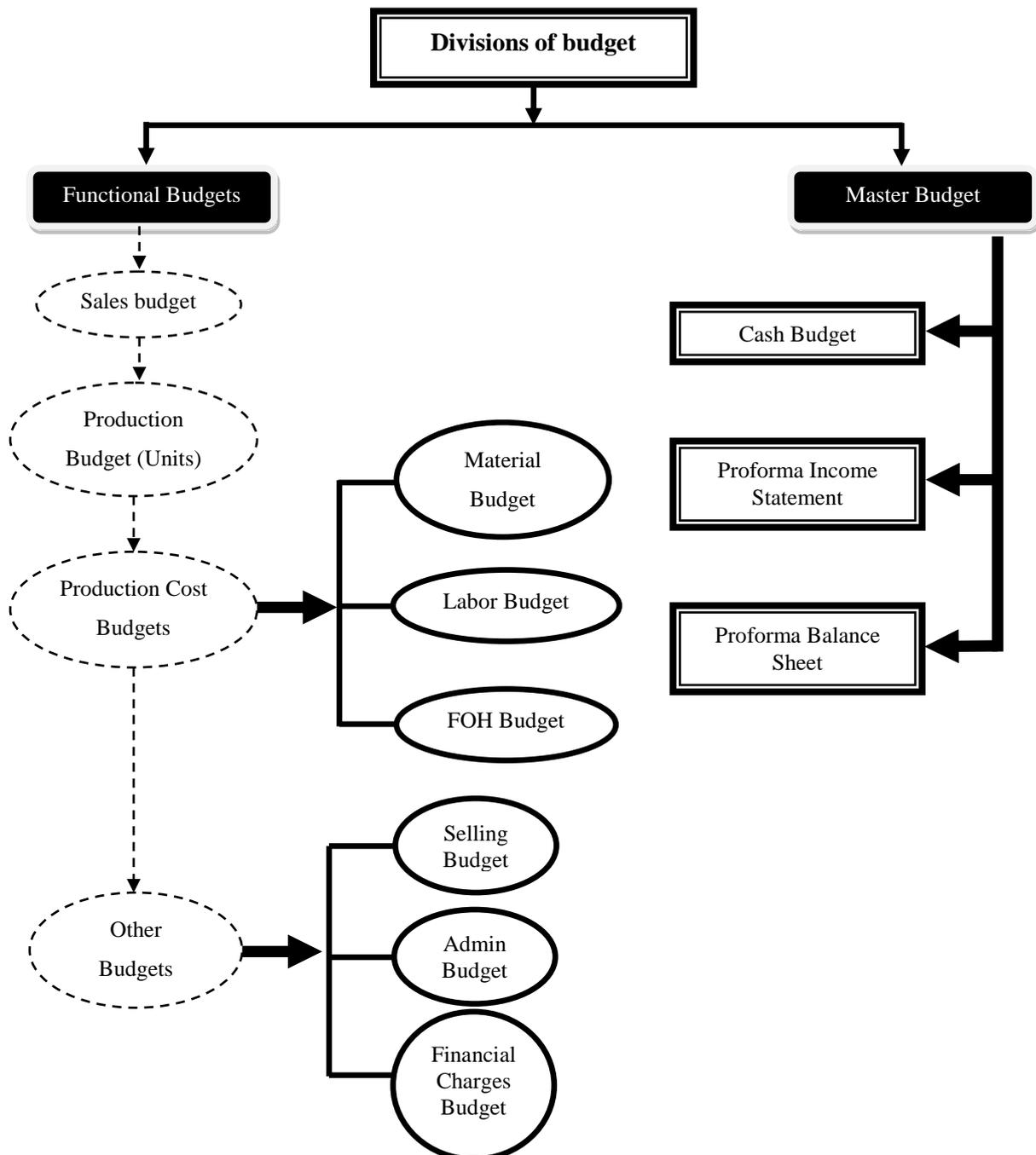
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FUNCTIONAL BUDGETS

Functional budgets are forecasts for related business functions, like sales, production, material, labor or FOH etc. A budget is quantitative expression of a plan of action, which are prepare in advance of the period to which it relates. Budget set out the cost and revenue that are expected to be incurred or earned in future periods. In short, functional budgets represent a comprehensive expression of management's plans for future and how these plans are to be accomplished.

17.1 Divisions of Budget

- Budgets can be divided into functional budgets and master budgets



17.1.1 Functional Budgets

- It usually consists of a number of separate but interdependent budgets. One budget may be necessary before the other can be initiated
- Following are different types of budgets

17.1.1.1 Sales Budget:

- ✓ The sales budget is the starting point in preparing the master budget
- ✓ A sales budget is a detailed schedule showing the expected sales for the budget period; typically, it is expressed in both amount and units of production
- ✓ An accurate sales budget is the key to the entire budgeting in some way. If the sales budget is sloppily done then the rest of the budgeting process is largely a waste of time
- ✓ The sales budget is constructed by multiplying the budgeted sales in units by the selling price
- ✓ The Sales Manager is directly responsible for the preparation and execution of this budget. Usually taking into consideration the following organizational and environmental factors while preparing the sales budget

Internal

Past sales figures and trends
 Salesmen’s estimates
 Plant capacity
 Orders on hand

 Availability of material or supplies

 Cost of distribution of goods
 Financial aspect

External

General trade prospects
 Seasonal fluctuation
 Potential market
 Government controls, rule and regulator relating to the industry
 Political situation and its impact on Market

Example # 17.1: Following data are extracted from ABC manufacturing Ltd. You are required to prepare sales budget?

Estimated Sales:

Product	Karachi	Lahore	Sales Price
A	5,000 units	4,000 units	Rs. 40 per unit
B	7,000 units	1,000 units	Rs. 10 per unit
C	12,000 units	7,000 units	Rs. 30 per unit

Solution:

Sales Budget (in units and Rupees)

Product	Karachi			Lahore			Total	
	Units	Price	Amount	Units	Price	Amount	Units	Amount
A								
B								
C								
Total	24,000	-	630,000	12,000	-	380,000	36,000	1,010,000

Example # 17.2: Estimated sales percentages for the first three-month period of the coming year of the Midland Company

Cities	January	February	March	Total
Karachi	50%	30%	20%	100%
Lahore	55	30	15	100
Islamabad	50	25	25	100
Peshawar	50	25	25	100

Estimated unit sales (at Rs. 2 per unit) by district for the three months are:

District	Units Sales
Karachi	20,000
Lahore	30,000
Islamabad	10,000
Peshawar	40,000
Total	100,000

Requirements: An estimate of sales by units and Rupees for each of the first three months for each district and in total

Solution:

Sales Budget (in units and Rupees)

Cities	January		February		March		Total	
	Units	Amount	Units	Amount	Units	Amount	Units	Amount
Karachi								
Lahore								
Islamabad								
Peshawar								
Total	51,500	103,000	27,500	55,000	21,000	42,000	100,000	200,000

17.1.1.2 Production Budget (Units):

- ❖ The production budget is prepared after the sales budget
- ❖ The production budget lists the number of units that must be produced during each budget period to meet sales needs and to provide for the desired ending inventory
- ❖ Production Budget (units) = Forecast sales + closing inventory of finished goods - opening inventory of finished goods

Example # 17.3: The ABC Company's sales forecasts for the next quarter, ending June 30, indicates the following

Product	Expected Sales
X	21,000 Units
Y	37,500
Z	54,300

Inventories at the beginning and desired quantities at the end of the quarter are as follows:

Product	March 31 st	June 30 th
X	5,800 units	6,200 Units
Y	10,600	10,500
Z	13,000	12,200

Requirement: A Production Budget in units for next quarter

Solution:

Production Budget (in units)

Description	Product X	Product Y	Product Z
Budgeted Sales			
Expected Ending Inventory			
Total Units Requirements			
Beginning Inventory			
Production Budget (in Units)	21,400	37,400	53,500

Example # 17.4: From the following details of Cement Works Limited, complete the production budget for the three-month period ending March 31, 2012

Types of Product	Estimated Stock on January 1, 2012	Estimated Sales	Estimated Stock on March 31, 2012
P	1,000	5,000	1,500
Q	1,500	7,500	2,500
R	2,000	6,500	1,500
S	500	6,000	1,000

Solution:

Production Budget (in units)

Description	Product P	Product Q	Product R	Product S
Production Budget (in Units)	5,500	8,500	6,000	6,500

17.1.1.3 Production Cost Budgets

⊗ Production cost budgets consist of Material Budget, Labor Budget and FOH Budget

17.1.1.3.1 Materials Budget:

- ❖ It is also called purchase or purchase requirement budget
- ❖ Material budget shows the amount of goods to be purchased from its suppliers during the period
- ❖ Materials budget is prepared after computing production requirements by preparing a production budget
- ❖ Direct materials budget details the raw materials that must be purchased to fulfill the production
- ❖ Material budget = Production requirement + ending inventory - opening inventory

Example # 17.5: Prepare Production Budget and Material Budget (units and amount) from the following figures:

Product	Expected Sales	Required material per unit	
		Material 1	Material 2
A	80,000	1 kg	2 Kg
B	40,000	2	4
C	100,000	3	1

Estimated Inventories at the beginning and desired quantities at the end of period as follows

Material KG	Beginning	Ending	Purchase Price per
1	10,000 Kg	12,000 Kg	Rs. 3
2	12,000	15,000	Rs. 5

Product	Beginning	Ending
A	5,000 Units	6,000
B	4,000	2,000
C	10,000	8,000

Solution:

Production Budget (in units)

Description	Product A	Product B	Product C
Budgeted Sales			
Expected Ending Inventory			
Total Units Requirements			
Beginning Inventory			
Production Budget (in Units)	81,000	38,000	98,000

Material Budget (in units and amount)

<i>Description</i>	Material 1	Material 2
Product A		
Product B		
Product C		
Production Requirement		
Desired Ending Inventory		
Total Requirement		
Beginning Inventory		
Material Budget (in unit)		
Purchase Price		
Material Budget in (amount)	1,359,000	2,075,000

Example # 17.6: Following data are extracted from XYZ manufacturing Ltd. You are required to prepare Production budget in unit and Material budget in unit and amount?

Estimated Sales:

Product	Sales units	Sales Price
X	700 units	Rs. 250 per unit
Y	500 units	Rs. 450 per unit
Z	900 units	Rs. 150 per unit

Inventories of material required:

Material	Opening inventory	Closing inventory	Unit cost
101	300 units	400 units	Rs. 10.00
102	100 units	250 units	Rs. 15.00
103	200 units	350 units	Rs. 25.0

Inventories of finished goods/product required:

Product	Opening inventory	Closing inventory	Unit cost
X	20 units	70 units	Rs. 125.70
Y	80 units	100 units	Rs. 82.50
Z	50 units	40 units	Rs. 64.00

Material Requirements:

Products	Material Requirements		
	101	102	103
X	2	7	3
Y	5	3	6
Z	4	8	1

Solution:

Production Budget (in units)

<i>Description</i>	<i>Product X</i>	<i>Product Y</i>	<i>Product Z</i>
Production Budget (in Units)	750	520	890

Material Budget (in units and amount)

<i>Description</i>	<i>101</i>	<i>102</i>	<i>103</i>
Material Budget (in amount)	Rs. 77,600	Rs. 211,200	Rs. 160,250

17.1.1.3.2 Labor Budget

- The direct labor budget is developed from the production budget
- Direct labor requirements must be computed so that the company will know whether sufficient labor time is available to meet the budgeted production needs
- Labor Budget = No of hours * rate per hour

Example # 17.7: A company produces products MM and KK and has budgeted to produce 6,000 units and 1,000 units respectively in coming year. The data about the labor hours required is mentioned below:

	MM per unit	KK per unit
Direct labor hours	8	12

Moreover, standard rate for direct labor is Rs. 5.20

Requirement: You are required to prepare labor budget in rupees

Labor Budget (in rupees)

<i>Product</i>	<i>Production</i>	<i>Hours per Unit</i>	<i>Total Hours</i>	<i>Rate Per Hour</i>	<i>Total</i>
MM					
KK					
Labor Budget (in rupees)					Rs. 312,000

Example # 17.8: A company produces products Chairs and Tables has budgeted to produce 900 units and 500 units respectively in coming year. The data about the labor hours required is mentioned below:

	Chair per unit	Table per unit
Direct labor hours	14	16

Moreover, standard rate for direct labor is Rs. 40 per hour for chair and Rs. 50 per hour for table

Requirement: You are required to prepare labor budget in rupees

Labor Budget (in rupees)

<i>Product</i>	<i>Production</i>	<i>Hours per Unit</i>	<i>Total Hours</i>	<i>Rate Per Hour</i>	<i>Total</i>
Labor Budget (in rupees)					Rs. 904,000

17.1.1.3.3 Manufacturing Overhead Budget

- The manufacturing overhead budget provides a schedule for all costs of production other than direct materials and direct labor

Example # 17.9: A company produces product MM and KK has budgeted to produce 6,000 units and 1,000 units respectively in coming years. The following data about the machine hours required to produce product MM and KK and the standard production overhead per machine hour is relevant to coming year

	MM per unit	KK per unit
Machine hours	8	12

Production overhead per machine hour

Variable	Rs. 1.54 per machine hour
Fixed	Rs. 0.54 per machine hour

Required: Calculate the overhead budget for the coming year?

Overhead Budget

Product	Production	Hours per Unit	Total Hours	Variable	Fixed	Total
MM						
KK						
Overhead Budget						Rs. 124,800

Example # 17.10: Following data are extracted from Wood manufacturing Ltd. You are required to prepare complete set of budgets?

Estimated Sales:

Product	Mansehra	Abbottabad	Sales Price
A	4,000 units	3,000 units	Rs. 200 per unit
B	6,000 units	5,000 units	Rs. 150 per unit
C	9,000 units	6,000 units	Rs. 100 per unit

Inventories of material required:

Material	Opening inventory	Closing inventory	Unit cost
X	30,000 units	40,000 units	Rs. 12.00
Y	10,000 units	12,000 units	Rs. 14.00
Z	2,000 units	2,500 units	Rs. 17.00

Inventories of finished goods/product required:

Product	Opening inventory	Closing inventory	Unit cost
A	200 units	250 units	Rs. 125.70
B	400 units	200 units	Rs. 82.50
C	500 units	400 units	Rs. 64.00

Material Requirements:

Products	Material Requirements		
	X	Y	Z
A	12	5	2
B	8	3	1
C	6	2	1

Labor Requirement:

Product	Labor Requirement (in hours) and Rates		
	Cutting Dept.	Assembling Dept.	Finishing Dept.
A	0.5	2.5	0.8
B	0.375	2.0	0.5
C	0.370	1.75	0.5
Rate per hour	Rs. 8	Rs. 10	Rs. 9

Overhead Requirement:

Product	Cutting Dept.	Assembling Dept.	Finishing Dept.	Total
A	Rs. 3.00	Rs. 7.50	Rs. 4.80	Rs. 15.30
B	2.25	6.00	3.00	11.25
C	2.75	5.25	3.00	10.50

Solution:

Sales Budget (in units and Rupees)

Production Budget (in units)

Further Study and Practice of Functional Budgets

Video Lecture (Functional Budgets)

<https://youtu.be/UhsGFXO2cGE>

Workbook Solution (Functional Budgets)

<https://www.accountancyknowledge.com/functional-budgets/>

Practice MCQs (Functional Budgets)

<https://www.accountancyknowledge.com/functional-budgets-mcqs/>

Problems and Solutions (Functional Budgets)

<https://www.accountancyknowledge.com/functional-budgets-problems-and-solutions/>

MASTER BUDGET

- The master budget consists of a number of budgets
- These include sales, production, direct materials, direct labor, manufacturing overhead, selling and administrative expenses, cash receipts and disbursements, and budgeted financial statements
- The master budget is a collection of smaller budgets that leads to pro-forma (budgeted) financial statements
- The first component of the master budget is the functional budgets. In addition the master budget contains the cash budget, budgeted income statement and budgeted balance sheet
- Each of the budgets impacts the company’s cash position, income statement, and balance sheet. The sales budget is the key to the entire master budgeting process, since most other master budget components depend on the level of sales. The pro-forma income statement and balance sheet are prepared from numbers contained in the various components of the other budgets

18.1 Cash Budget

- Cash budget is a detailed plan showing how cash resources will be acquired and used over some specific time period
- Cash budget is composed of three major sections
 1. The receipts section
 2. The disbursements section
 3. The cash excess or deficiency section

18.1.1 The receipts section

- ✦ The cash receipts section consists of a listing of all of the cash inflows, except for financing, expected during the budgeting period. Generally, the major source of receipts will be from sales

Example #18.1: Naeem Corporation analyzed its payments from customers, it found that 30% of the invoiced amounts were paid in the same month as the work was done and the other 70% were paid in the following month. Revenue information for selected months is presented below:

<i>Month</i>	<i>Revenue</i>	<i>Month</i>	<i>Revenue</i>
November 2011	Rs. 85,000	February 2012	87,000
December 2011	90,000	March 2012	69,000
January 2012	92,000	April 2012	83,000

Calculate the monthly cash receipts for January, February, and March of 2012

Solution:

Description	January	February	March
Total	Rs. 90,600	Rs. 90,500	Rs. 81,600

Example #18.2: All of Ali and Ahmed’s sales are on account. In the past, 15% of the amounts charged have been paid in the same month as the sale, 60% were paid in the following month, and the rest were paid in the second month following the sale. Sales for selected months are given below:

<i>Month</i>	<i>Revenue</i>	<i>Month</i>	<i>Revenue</i>
November 2010	Rs. 580,000	March 2011	750,000
December 2010	600,000	April 2011	725,000
January 2011	550,000	May 2011	700,000
February 2011	650,000		

Prepare the cash receipts budget for the first three months of 2011

Solution:

Description	January	February	March
Total	Rs. 587,500	Rs. 577,500	Rs. 640,000

18.1.2 The disbursements section

- The disbursement section consists of all cash payment that is planned for the budgeted period
- These payments will include raw materials purchases, direct labor payments, manufacturing overhead costs, and so on as contained in their respective budgets
- In addition, other cash disbursements such as equipment purchase, dividends, and other cash withdrawals by owners are listed

Example #18.3: Anees Fida Company pays for 40% of its inventory purchases in the month of the purchase and the remainder in the following month. The company’s inventory purchases totaled Rs. 850,000 in October, Rs. 980,000 in November, and Rs. 720,000 in December. The company also paid for new equipment with a total cost of Rs. 520,000 in November and made a tax payment of Rs. 130,000 in December. Salaries and wages were paid as follows: Rs. 310,000 in October, Rs. 300,000 in November and Rs. 295,000 in December.

Determine the firm’s cash disbursements for November and December

Solution:

Description	November	December
Total	Rs. 1,722,000	Rs. 1,301,000

Example #18.4: Pakistan Company has budgeted the following information for 2011:

	<u>May</u>	<u>June</u>	<u>July</u>
Budgeted purchases	Rs. 104,000	Rs. 110,000	Rs. 102,000

- Cost of goods sold is 40% of sales. Accounts payable is used only for inventory acquisitions
- Company purchases and pays for merchandise 60% in the month of acquisition and 40% in the following month
- Selling and administrative expenses are budgeted at Rs. 30,000 for May and are expected to increase 5% per month. They are paid during the month of acquisition. In addition, budgeted depreciation is Rs. 10,000 per month
- Income taxes are Rs. 38,400 for July and are paid in the month incurred

Instructions: Compute the amount of budgeted cash disbursements for July.

Solution:

Description	July
Total	Rs. 176,675

18.1.3 The cash excess or deficiency section

- ♣ This section is result of above two sections
- ♣ If receipts is higher than disbursement than result is cash excess
- ♣ If receipts is lower than disbursement than result is cash deficiency

Example #18.5: Waleed, Inc. has budgeted sales revenues as follows for 2011:

	<i>June</i>	<i>July</i>	<i>August</i>
Credit sales	Rs. 135,000	Rs. 125,000	Rs. 90,000
Cash sales	90,000	255,000	195,000
Total sales	Rs. 225,000	Rs. 380,000	Rs. 285,000

Past experience indicates that 60% of the credit sales will be collected in the month of sale and the remaining 40% will be collected in the following month. Purchases of inventory are all on credit and 50% are paid in the month of purchase and 50% in the month following purchase. Budgeted inventory purchases are:

June	Rs. 300,000
July	240,000
August	105,000

Other cash disbursements budgeted: (a) Selling and administrative expenses of Rs. 48,000 each month, (b) Dividends of Rs. 103,000 will be paid in July, and (c) Purchase of equipment in August for Rs. 30,000 cash.

The company wishes to maintain a minimum cash balance of Rs. 50,000 at the end of each month. The company borrows money from the bank at 6% interest if necessary to maintain the minimum cash balance. Borrowed money is repaid in months when there is an excess cash balance. The beginning cash balance on July 1 was Rs. 50,000. Assume that borrowed money in this case is for one month.

Instructions

Prepare a cash budget for the months of July and August 2011

Solution:

Waleed, Inc.

Cash Budget

For month of July and August, 2011

Description	July	August
Total Cash Receipts	434,000	349,000

Cash Disbursements:		
Total Cash Disbursements	(421,000)	(250,500)
Ending Cash Balance	50,000	61,315

Example #18.6: Cooper Company has budgeted activity for January, 2011 using the following data:

Description	Amount
Cash sales	Rs. 25,000
Credit sales (60% collected in month of sale)	380,000
Selling and administrative costs (including depreciation)	50,000
Depreciation expense	5,000
Merchandise Inventory, January 1	21,000
Merchandise Inventory, January 31	20,000
Beginning cash balance	3,000
Minimum cash balance required	2,500
Cost of goods sold is 55% of Cooper's selling price	
All purchases are paid in cash	
Selling and administrative costs are paid in month of purchase	

Required: Prepare a cash budget for January

