

NME – II: COST AND MANAGEMENT ACCOUNTING

Objective of the course :This course introduces the concepts of Cost and Management Accounting

Unit-1: Cost Accounting: Definition, Meaning and objectives Distinction between Cost and Financial Accounting. Management Accounting – Definition and objectives – Distinction between management and financial accounting.

Unit-2: Stores Records Inventory Control ABC Analysis Economic Ordering Quantity Maximum, Minimum and Reordering levels Methods of Pricing Issued. Labour: Importance of Labour Cost Control Various Methods of Wage Payment.

Unit-3:Overheads: Factory, Administration, Selling and Distribution of overheads Classification Allocation and Apportionment Redistribution (Secondary Distribution) Absorption of Over heads including 'Machine Hour Rate

Unit-4:Funds Flow and Cash Flow Analysis: Preparation of Statement' Ratio Analysis : Utility and limitations of Accounting Ratios calculation of Accounting Ratios Ratio Analysis for Liquidity, Solvency, Profitability and Leverage.

Unit-5:Marginal Costing: The Concept Break Even Analysis Break Even Chart Importance and assumptions Application of Profit Volumes Ratio Different types of problems (with special emphasis on decision making problems). Budget and Budgetary Control : Procedure and Utility Preparation of different types of Budget including Flexible Budget

1. Recommended Texts & Reference Books:

1. Wheldon A.J., Cost Accounting and Costing Methods.
2. Iyengar S.P., Cost Accounting : Principles and Practice.
3. Bhar B.K., Cost Accounting : Methods and problems.
4. Bigg W.W., Cost Accounts.
5. Prasad N.K, Cost Accounting : Principles and Problems.
6. Jain S.P. and Narang K.L., Advanced Cost Accounting.
7. Agarwal M., Theory and Practices of Cost Accounting
8. Robert Anthony : Management Accounting : Text and cases.
9. Maheswari S.N., Principles of Management Accounting.

Solution:**Cost Sheet**

<i>Particulars</i>	<i>Rs.</i>	<i>Rs.</i>
Direct material consumed		50,000
Direct wages		40,000
Chargeable expenses		10,000
		<u>1,00,000</u>
<u>Prime cost</u>		
Add: <i>Factory overheads:</i>		
Indirect material used in factory	8,000	
Indirect labour used in factory	15,000	
Indirect expenses relating to factory	6,000	29,000
		<u>1,29,000</u>
<u>Factory cost</u>		
Add: <i>Administration overheads:</i>		
Indirect materials used in office	12,000	
Indirect labour in office	20,000	
Indirect expenses of office	3,000	35,000
		<u>1,64,000</u>
<u>Cost of production</u>		
Add: <i>Selling and Distribution overhead:</i>		
Indirect material used in selling	6,000	
Indirect labour in selling	18,000	
Indirect expenses for selling	1,000	25,000
Indirect material used for distribution	4,000	
Indirect wages for distribution	12,000	16,000
		<u>2,05,000</u>
<u>Cost of sales</u>		

Note: 'Chargeable expenses' is an alternative term for 'direct expenses'.

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- (c) Capital expenses and losses written off like goodwill, preliminary expenses, discount on issue of shares, etc.
- (d) Appropriations like dividends paid, transfer to reserves.
- (5) Profit given as percentage of selling price
Usually profit is added to the cost of sales to ascertain the sale price.
If profit percentage is given on sales, it must be converted to percentage on cost.

For example if profit is 20% on sale.
Sale is 100; profit 20 ∴ Cost = $100 - 20 = 80$

$$\text{Profit to cost } \frac{20}{80} = \frac{1}{4} \text{ (or) } 25\%$$

(6) Standard Assumptions

In the context of tenders or quotations, the following assumptions can be made if nothing contrary is given in the problem.

- (a) Factory overhead to direct wages ratio of the previous period holds good for current period also.
- (b) Administrative overhead to works cost ratio of the previous period is applicable in current period also.

ILLUSTRATIONS

(A) Simple Cost Sheet

Illustration 1

Prepare a Cost Sheet from the following data:



Particulars	Rs.	Rs.
Direct material consumed		50,000
Direct wages paid		40,000
Chargeable expenses		10,000
<i>Indirect materials:</i>		
Used in factory	8,000	
Used in office	12,000	
Used in selling	6,000	
Used in distribution	4,000	30,000
<i>Indirect labour:</i>		
In factory	15,000	
In office	20,000	
In selling	18,000	
In distribution	12,000	65,000
<i>Indirect expenses:</i>		
Relating to factory	6,000	
Relating to office	3,000	
Relating to selling	1,000	10,000

II. EOQ – ECONOMIC ORDERING QUANTITY

(A) Simple Problems

Illustration 1

Find out the economic order quantity (EOQ) from the following particulars:

Annual usage : 6,000 units

Cost of Material per unit : Rs. 20

Cost of placing and Receiving one order : Rs.60. Annual carrying cost of one unit : 10% of Inventory value.

[Madras, B.C.S. Oct. 2001 (10 times);

B.C.A., B.Sc., Oct. 2001;

Solution:

B.C.A./B.Sc., (ICE) Oct. 2001; Madurai, B.B.A., Nov. 1991]

$$EOQ = \sqrt{\frac{2AB}{CS}}$$

where :

A = Annual Usage

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost % P.A.

$$EOQ = \sqrt{\frac{2 \times 6,000 \times 60}{20 \times \frac{10}{100}}} = 600 \text{ Units}$$

(B) EOQ-with ordering schedule

Illustration 2

Find out the economic order quantity, the number of orders per year and their frequency from the following information:

Monthly consumption 3,000 units.

Cost per unit Rs.54

Ordering cost Rs.150 per order.

Inventory carrying cost 20% of the average inventory.

[I.C.W.A adapted]

Solution:

Annual consumption = $3,000 \times 12 = 36,000$ units

$$EOQ = \sqrt{\frac{2AB}{CS}}$$

where

A = Annual usage of Material

B = Buying cost per order

C = Cost per unit

III – COMPUTATION OF STOCK LEVELS

(A) Stock levels for one material

Illustration 1

Material 'A' is used as follows :

Maximum usage in a month 600 Nos.

Minimum usage in a month 400 Nos.

Average usage in a month 450 Nos.

Lead time : Maximum 6 months, minimum 2 months.

Reorder Quantity : 1,500 Nos.

Maximum reorder period for emergency purchases – 1 month.

Calculate

- (a) Reorder level
- (b) Maximum level
- (c) Minimum level
- (d) Average stock level
- (e) Danger level

Solution :

The terms 'Lead-Time' and 'Reorder period' mean the same thing.

'Usage' and 'Consumption' are also used as alternative terms.

'Average' and 'normal' are used interchangeably.

$$\begin{aligned}
 \text{(a) Reorder level} &= \text{Maximum consumption} \times \text{Maximum reorder period} \\
 &= 600 \text{ Units} \times 6 \text{ Months} \\
 &= 3,600 \text{ Units}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) Maximum stock level} &= \text{Reorder level} + \text{Reorder quantity} - (\text{Minimum consumption} \times \text{minimum reorder period}) \\
 &= 3,600 + 1,500 - (400 \times 2) \\
 &= 5,100 - 800 = 4,300 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 \text{(c) Minimum stock level} &= \text{Reorder level} - (\text{Normal consumption} \times \text{Normal reorder period}) \\
 &= 3,600 - \left(450 \times \frac{(6+2)}{2} \right) \\
 &= 3,600 - (450 \times 4) \\
 &= 1,800 \text{ units}
 \end{aligned}$$

where

$$\text{Normal reorder period} = \frac{\text{Maximum Reorder period} + \text{Minimum reorder period}}{2}$$

$$\begin{aligned}
 \text{(d) Average stock level} &= \frac{\text{Maximum stock level} + \text{Minimum stock level}}{2} \\
 &= \frac{4,300 + 1,800}{2} = 3,050 \text{ units}
 \end{aligned}$$

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Average stock level is also calculated by using the following formula:

$$\begin{aligned}
 &= \text{Minimum stock level} + \frac{1}{2} \text{ of reorder quantity} \\
 &= 1,800 + \left(\frac{1}{2} \times 1,500 \right) \\
 &= 2,550 \text{ Units}
 \end{aligned}$$

However, the former method is more popular.

(e) Danger level

$$\begin{aligned}
 &= \text{Average consumption} \times \text{Maximum reorder period for} \\
 &\quad \text{emergency purchases} \\
 &= 450 \text{ units} \times 1 \text{ month} = 450 \text{ units.}
 \end{aligned}$$

Illustration 2

In a company, weekly minimum and maximum consumption of material 'A' are 25 and 75 units respectively. The reorder quantity as fixed by the company is 300 units. The material is received within 4 to 6 weeks from issue of supply order. Calculate minimum level and maximum level of material 'A'.

[Madras, B.Com. (ICE) Oct 2005; C.A. Inter. May 1995]

Solution:

Reorder level

$$\begin{aligned}
 &= \text{Maximum consumption} \times \text{Maximum reorder period} \\
 &= 75 \times 6 = 450 \text{ units}
 \end{aligned}$$

Maximum stock level

$$\begin{aligned}
 &= \text{Reorder level} + \text{Reorder quantity} - (\text{Minimum} \\
 &\quad \text{consumption} \times \text{Minimum reorder period}) \\
 &= 450 + 300 - (25 \times 4)
 \end{aligned}$$

$$= 650 \text{ units}$$

Minimum Stock level

$$\begin{aligned}
 &= \text{Reorder level} - (\text{Normal Consumption} \times \text{Normal} \\
 &\quad \text{reorder period})
 \end{aligned}$$

$$= 450 - \left(\frac{(25+75)}{2} \times \frac{(4+6)}{2} \right)$$

$$= 450 - (50 \times 5)$$

$$= 200 \text{ units}$$

where

$$\text{Normal Consumption} = \frac{\text{Maximum Consumption} + \text{Minimum Consumption}}{2}$$

where

$$\text{Normal reorder period} = \frac{\text{Maximum reorder period} + \text{Minimum reorder period}}{2}$$

Solution:

$$(1) \text{ Reorder level} = \text{Maximum consumption} \times \text{Maximum Reorder period}$$

$$= 7,500 \times 4$$

$$= 30,000 \text{ units}$$

(2) Reorder quantity is derived from maximum stock level as follows:

$$\text{Maximum stock level} = \text{Reorder level} + \text{Reorder Quantity} - (\text{Minimum consumption} \times \text{Minimum reorder period})$$

$$42,000 = 30,000 + \text{ROQ} - (4000 \times 2)$$

$$42,000 = 30,000 + \text{ROQ} - 8,000$$

$$42,000 - 22,000 = \text{ROQ}$$

$$\text{ROQ} = 20,000 \text{ units}$$

$$\text{Reorder Quantity} = 20,000 \text{ units.}$$

IV. PRICING OF MATERIAL ISSUES

A) First in First out method (FIFO) (Without Returns And losses)

Illustration 1

From the particulars given below write up the stores ledger card :

1988

January 1	Opening stock	1,000 units at Rs. 26 each.	✓
5	Purchased	500 units at Rs. 24.50 each.	
7	Issued	750 units.	
10	Purchased	1,500 units at Rs. 24 each.	
12	Issued	1,100 units.	
15	Purchased	1,000 units at Rs. 25 each.	
17	Issued	500 units.	
18	Issued	300 units.	
25	Purchased	1,500 units at Rs. 26 each.	
29	Issued	1,500 units.	

Ques/:

Ans/:

Ques/:

Adopt the FIFO method of issue and ascertain the value of the closing stock.

[Madras, B.A. Corp., Sept. 1988]

Solution:**Stores Ledger Account****FIFO Method**

Name : _____

Maximum level : _____

Code No.: _____

Minimum level : _____

Description: _____

Reorder level : _____

Folio No. _____

Bin. No. _____

Location code: _____

Reorder quantity: _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs. P	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.
1998										
Jan. 1	Balance									
	B/d							1,000	26.00	26,000
5	G.R.N. No.	500	24.50	12,250				1,000	26.00	26,000
								500	24.50	12,250
7	M.R. No.				750	26.00	19,500	250	26.00	6,500
								500	24.50	12,250
10	G.R.N. No.	1,500	24.00	36,000				250	26.00	6,500
								500	24.50	12,250
								1,500	24.00	36,000
								250	26.00	6,500
								500	24.50	12,250
								350	24.00	8,400
								1,150	24.00	27,600
12	M.R. No.				1,100					
15	G.R.N. No.	1,000	25.00	25,000				1,150	24.00	27,600
								1,000	25.00	25,000
17	M.R. No.				500	24.00	12,000	650	24.00	15,600
								1,000	25.00	25,000
18	M.R. No.				300	24.00	7,200	350	24.00	8,400
								1,000	25.00	25,000
25	G.R.N. No.	1,500	26.00	39,000				350	24.00	8,400
								1,000	25.00	25,000
								1,500	26	39,000
								350	24.00	8,400
								1,000	25.00	25,000
								150	26.00	3,900
								1,350	26.00	35,100
29	M.R. No.				1,500					

Closing stock 1,350 units at Rs. 26 each = Rs.35,100

Note : G.R.N. No. = Goods Received note number.

M.R. No. = Material Requisition Number. *Issue Jmkt*

(B) Last in first out method (LIFO) (Without Returns and Losses)

Illustration 2

✓ Prepare stores ledger account under LIFO method from the information given in Illustration 1 above.

Solution:

**Stores Ledger Account
(LIFO Method)**

Name : _____
Code No.: _____
Description: _____

Maximum level : _____
Minimum level : _____
Reorder level : _____

Folio No. _____
Bin. No. _____
Location code: _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.
1998										
Jan. 1	Balance B/d							1,000	26.00	26,000
5	G.R.N.No.	500	24.50	12,250	500	24.50	12,250	1000	26.00	26,000
					250	26.00	6,500	500	24.50	12,250
					750			750	26.00	19,500
7	M.R. No.							750	26.00	19,500
10	G.R.N.No.	1,500	24.00	36,000				1,500	24.00	36,000
12	M.R. No.				1,100	24.00	26,400	750	26.00	19,500
								400	24.00	9,600
15	G.R.N.No.	1,000	25.00	25,000				750	26.00	19,500
								400	24.00	9,600
								1,000	25.00	25,000
17	M.R. No.				500	25.00	12,500	750	26.00	19,500
								400	24.00	9,600
								500	25.00	12,500
18	M.R. No.				300	25.00	7,500	750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000
25	G.R.N.No.	1,500	26.00	39,000				750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000
								1,500	26.00	39,000
29	M.R. No.				1,500	26.00	39,000	750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000

Closing Stock = 1,350 units, valued at Rs.34,100 ($750 \times 26 + 400 \times 24 + 200 \times 25$)

Note : G.R.N.No.= Goods Received Note Number; M.R.No.= Material Requisition Number

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2. The stock in hand of a material as on 1-9-1986 was 500 units at Re. 1 per unit. The following purchases and issues were subsequently made. Prepare the stores ledger account showing how the value of the issue would be recorded under FIFO.

Purchases	Issues
6-9-1986 100 units at Rs. 1.10	9-9-86 - 500 units
20-9-1986 700 units at Rs. 1.20	22-9-86 - 500 units
27-9-1986 400 units at Rs. 1.30	30-9-86 - 500 units
13-10-1986 1,000 units at Rs. 1.40	15-10-86 - 500 units.

[Madras, B.A. Corp., Sept. 199]

[Ans : Closing Stock : 700 units at Rs. 1.40 = Rs. 98]

3. The following information is extracted from the stores ledger :

Sep. 1	Opening balance	500	units at	Rs. 10
6	Purchases	100	units at	Rs. 11
20	Purchases	700	units at	Rs. 12
27	Purchases	400	units at	Rs. 13
Oct. 13	Purchases	1,000	units at	Rs. 14
20	Purchases	500	units at	Rs. 15
Nov. 17	Purchases	400	units at	Rs. 16

Issues of Materials :

Sep. 9	-500 units
22	-500 units
30	-500 units
Oct. 15	-500 units
22	-500 units
Nov. 11	-500 units

Issues are to be priced on the principle of 'FIFO'. Write the stores ledger account

[Madras, B.Com. (ICE), May 19]

[Ans : Closing Stock 600 units at Rs. 9,400 (200 × 15+400 × 16+200 × 17)]

4. The following information is extracted from the stores ledger.

Jan. 1	Opening Balance	500 units at Rs. 4
5	Purchases	200 units at Rs. 4.25.
12	Purchases	150 units at Rs. 4.10.
20	Purchases	300 units at Rs. 4.50.
25	Purchases	400 units at Rs. 4.

Issues of Materials were as follows :

Jan. 4	200 units.
10	400 units.
15	100 units
19	100 units.
26	200 units.
30	250 units.

Issues are to be priced on the principle of 'FIFO' method. Write the stores ledger Account.

*[Madras, B.Com. (old) April 2002;
B.Com., C & M, Mar. 1996]*

[Ans : Closing stock : 300 units at Rs. 4 per unit = Rs. 1,200]

5. From the following transactions extracted from the books of accounts of a manufacturing concern as on 31st Dec. 1994, work out (a) Consumption value of raw materials in the month and (b) Value of closing stock as on 31. Dec. 1994 under the FIFO method of pricing issues. Show results in a tabular form.

1994 Dec.		Quantity in units	Rate per unit (Rs.)
1	Opening Stock	300	9.70
3	Purchases	250	9.80
11	Issues	400	
15	Purchases	300	10.05
20	Issues	210	
25	Purchases	150	10.30
29	Issues	100	

[Madras, B.Com. C & M, March 1995]

[Ans : (a) Consumption value of Raw Materials – 710 units, value Rs. 6,968;

(b) Stock as on 31-12-94 = 290 units, value Rs. 2,952

$(140 \times 10.05 + 150 \times 10.30)$

Summary of Formulae for Computation of Ratios

<i>Sl. No.</i>	<i>Ratio</i>	<i>Alternative Names</i>	<i>Formula</i>
<i>I</i>	<i>Profitability ratios</i>		
(1)	Return on investment	ROI	$\frac{\text{Operating profit}}{\text{Capital employed}} \times 100$
(2)	Return on shareholders funds	-	$\frac{\text{Net profit after interest and tax}}{\text{Shareholders' funds}} \times 100$
(3)	Return on equity share holders funds	Return on equity Return on net worth	$\frac{\text{Net profit after interest, tax and pref. dividend}}{\text{Equity shareholders' funds}} \times 100$
(4)	Return on total assets		$\frac{\text{Net profit after tax + Interest}}{\text{Total assets} - \text{Fictitious assets}} \times 100$
(5)	Gross profit ratio	G/P ratio	$\frac{\text{Gross profit}}{\text{Net sales}} \times 100$
(6)	Operating profit ratio	-	$\frac{\text{Operating profit}}{\text{Net sales}} \times 100$
(7)	Operating ratio	-	$\frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$
(8)	Expenses ratios		$\frac{\text{Specific expenses}}{\text{Net sales}} \times 100$
(9)	Net profit ratio	N/P Ratio	$\frac{\text{Net profit after tax}}{\text{Net sales}} \times 100$
(10)	Earnings per share	E.P.S.	$\frac{\text{Net profit after tax and preference dividend}}{\text{No. of equity shares}}$
(11)	Price earnings ratio	P/E ratio	$\frac{\text{Market price per equity share}}{\text{Earnings per equity share}}$
(12)	Pay out ratio	-	$\frac{\text{Equity dividend}}{\text{Net profit after tax and pref. dividend}} \times 100$ (or) $\frac{\text{Dividend per equity share}}{\text{Earnings per equity share}} \times 100$
(13)	Retained earnings ratio	-	$\frac{\text{Retained earnings}}{\text{Net profit after tax and pref. dividend}} \times 100$

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Sl. No.	Ratio	Alternative Names	Formula
(14)	Interest cover ratio	Fixed charges cover ratio	$\frac{\text{Profit before interest and tax}}{\text{Fixed interest charges}}$
(15)	Dividend yield ratio	-	$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$
II <i>Turnover ratios:</i>			
(16)	Inventory turnover ratio	Stock turnover ratio Stock velocity	$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$
(17)	Inventory turnover period	Stock turnover period Stock velocity in days or months	$\frac{\text{Days / months in the year}}{\text{Inventory turnover ratio}}$
(18)	Debtors turnover ratio	Receivables turnover Debtors' velocity	$\frac{\text{Net credit sales}}{\text{Average receivables}}$
(19)	Debtors' collection period	Average collection period	$\frac{\text{Days / months in the year}}{\text{Debtors' turnover ratio}}$
(20)	Creditors' turnover ratio	Accounts payables' turnover Creditors' velocity	$\frac{\text{Net credit purchases}}{\text{Average accounts payable}}$
(21)	Average payment period	Creditors' payment period	$\frac{\text{Days / months in the year}}{\text{Creditors turnover ratio}}$
(22)	Working capital turnover ratio	-	$\frac{\text{Cost of sales or Sales}}{\text{Net working capital}}$
(23)	Fixed assets turnover ratio	-	$\frac{\text{Cost of goods Sold}}{\text{Net fixed assets}}$
			(or)
			$\frac{\text{Sales}}{\text{Net fixed assets}}$
(24)	Capital turnover ratio	-	$\frac{\text{Sales (or) Cost of sales}}{\text{Capital employed}}$
(25)	Owned capital turnover ratio	-	$\frac{\text{Sales (or) Cost of sales}}{\text{Shareholders' funds}}$

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Sl. No.	Ratio	Alternative Names	Formula
(14)	Interest cover ratio	Fixed charges cover ratio	$\frac{\text{Profit before interest and tax}}{\text{Fixed interest charges}}$
(15)	Dividend yield ratio	-	$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$
II <i>Turnover ratios:</i>			
(16)	Inventory turnover ratio	Stock turnover ratio Stock velocity	$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$
(17)	Inventory turnover period	Stock turnover period Stock velocity in days or months	$\frac{\text{Days / months in the year}}{\text{Inventory turnover ratio}}$
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(19)	Debtors' collection period	Average collection period	$\frac{\text{Days / months in the year}}{\text{Debtors' turnover ratio}}$
(20)	Creditors' turnover ratio	Accounts payables' turnover Creditors' velocity	$\frac{\text{Net credit purchases}}{\text{Average accounts payable}}$
(21)	Average payment period	Creditors' payment period	$\frac{\text{Days / months in the year}}{\text{Creditors turnover ratio}}$
(22)	Working capital turnover ratio	-	$\frac{\text{Cost of sales or Sales}}{\text{Net working capital}}$
(23)	Fixed assets turnover ratio	-	$\frac{\text{Cost of goods Sold}}{\text{Net fixed assets}}$
			(or)
			$\frac{\text{Sales}}{\text{Net fixed assets}}$
(24)	Capital turnover ratio	-	$\frac{\text{Sales (or) Cost of sales}}{\text{Capital employed}}$
(25)	Owned capital turnover ratio	-	$\frac{\text{Sales (or) Cost of sales}}{\text{Shareholders' funds}}$

ILLUSTRATIONS**(A) PROFITABILITY RATIOS****Illustration 1**

Calculate Gross Profit Ratio from the following figures:

	Rs.
Sales	10,00,000
Sales returns	1,00,000
Opening stock	2,00,000
Purchases	6,00,000
Purchase returns	1,50,000
Closing stock	65,000

Solution:

$$\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

Gross profit is ascertained by preparing Trading Account.

Trading Account

Particulars	Rs.	Particulars	Rs.
To Opening Stock	2,00,000	By Sales	10,00,000
To Purchases	6,00,000	Less: Returns	1,00,000
Less: Returns	1,50,000	Net sales	9,00,000
To Gross profit	3,15,000	By Closing stock	65,000
	9,65,000		9,65,000

$$\text{Gross profit ratio} = \frac{3,15,000}{9,00,000} \times 100 = 35\%$$

Illustration 2

(a) From the following details of a business concern calculate net profit ratio.

	Rs.
Sales	3,50,000
Cost of goods sold	1,50,000
Administration exp.	50,000
Selling expenses	10,000

(b) From the following details you are required to ascertain net profit and calculate net profit ratio.

	Rs.
Sales	5,40,000
Sales returns	40,000

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Income Statement		Rs.	Rs.
Particulars			
Sales		8,60,000	
Less: Sales returns		60,000	
Net sales			8,00,000
Less: Cost of goods sold			3,50,000
Gross profit			4,50,000
Non operating incomes:			
Add: Profit on sale of investments			30,000
Income from investments			20,000
			5,00,000
Less: Operating expenses:			
Administration expenses		40,000	
Selling expenses		60,000	
Distribution expenses		20,000	
Non operating expenses			
Finance expenses		30,000	
Loss on sale of plant		20,000	
Provision for income tax		30,000	2,00,000
Net profit			3,00,000

Solution:

$$\begin{aligned}
 (1) \text{ Operating ratio} &= \frac{\text{Cost of sales} + \text{Operating expenses}}{\text{Net sales}} \times 100 \\
 &= \frac{3,50,000 + 40,000 + 60,000 + 20,000}{8,00,000} \times 100 \\
 &= \frac{4,70,000}{8,00,000} \times 100 = 58.75\%
 \end{aligned}$$

Note: Administration, selling and distribution expenses are the operating expenses. Finance expenses are generally regarded as non-operating. Similarly provision for tax, loss on sale of plant are also non operating losses or expenses.

(2) Expense Ratios:

$$\begin{aligned}
 (a) \text{ Administration expense ratio} &= \frac{\text{Administration expenses}}{\text{Net sales}} \times 100 \\
 &= \frac{40,000}{8,00,000} \times 100 = 5\%
 \end{aligned}$$

$$(b) \text{ Selling expense ratio} = \frac{\text{Selling expenses}}{\text{Net sales}} \times 100$$

$$= \frac{60,000}{8,00,000} \times 100 = 7.5\%$$

$$(c) \text{ Distribution expense ratio} = \frac{\text{Distribution expenses}}{\text{Net sales}} \times 100$$

$$= \frac{20,000}{8,00,000} \times 100 = 2.5\%$$

$$(d) \text{ Finance expense ratio} = \frac{\text{Finance expenses}}{\text{Net sales}} \times 100$$

$$= \frac{30,000}{8,00,000} \times 100 = 3.75\%$$

$$(3) \text{ Operating profit ratio} = \frac{\text{Operating profit}}{\text{Net sales}} \times 100$$

Operating profit = Gross profit - Operating expenses

$$= 4,50,000 - 40,000 - 60,000 - 20,000$$

$$= \text{Rs. } 3,30,000$$

$$\begin{aligned} (\text{or}) \text{ Operating profit} &= \text{Net profit} + \text{Non operating expenses and} \\ &\quad \text{losses} - \text{Non operating incomes} \\ &= 3,00,000 + 30,000 + 20,000 + 30,000 - 30,000 - 20,000 \\ &= 3,30,000 \end{aligned}$$

$$\therefore \text{ Operating profit ratio} = \frac{3,30,000}{8,00,000} \times 100 = 41.25\%$$

$$(4) \text{ Gross profit ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

$$= \frac{4,50,000}{8,00,000} \times 100 = 56.25\%$$

$$(5) \text{ Net profit ratio} = \frac{\text{Net profit}}{\text{Net sales}} \times 100$$

$$= \frac{3,00,000}{8,00,000} \times 100 = 37.5\%$$

- Note:**
- (1) Operating profit shows profit resulting from routine or normal business operations. Operating profit ratio added to operating ratio should be equal to 100 because they are like two sides of the same coin.
 - (2) Net profit ratio reflects all the profits and losses – both operating and non operating. It is important from shareholders point of view.

Illustration 17

Ganesh Bros. sells goods on cash and credit terms and also purchased goods on cash and credit terms. The following particulars are obtained from their books:

	Rs.
Total sales	5,00,000
Cash sales	40,000
Sales returns	20,000
Debtors at the end	80,000
Bills receivable at the end	20,000
Reserve for doubtful debts	1,000
Total purchases	3,00,000
Cash purchases	50,000
Purchase returns	10,000
Creditors at the end	60,000
Bills payable at the end	20,000
Reserve for discount on creditors	2,000
Opening stock	50,000
Closing stock	40,000
Gross profit	1,00,000
Fixed assets	10,00,000

Calculate activity ratios (turnover ratios)

Solution:

Activity ratios (or) Turnover Ratios

$$\begin{aligned}
 (1) \text{ Stock turnover ratio} &= \frac{\text{Cost of sales}}{\text{Average stock}} \\
 \text{Cost of sales} &= \text{Sales} - \text{Gross profit} \\
 &= 4,80,000 - 1,00,000 = 3,80,000 \\
 \text{Net Sales} &= \text{Sales} - \text{Sales returns} \\
 &= 5,00,000 - 20,000 \\
 &= 4,80,000 \\
 \text{Average stock} &= \frac{\text{Opening stock} + \text{Closing stock}}{2} \\
 &= \frac{50,000 + 40,000}{2} \\
 &= 45,000 \\
 \therefore \text{Stock turnover ratio} &= \frac{3,80,000}{45,000} = 8.44 \text{ times}
 \end{aligned}$$

3.48

$$(2) \text{ Fixed assets turnover ratio} = \frac{\text{Cost of sales}}{\text{Fixed assets}} \text{ (or)} \frac{\text{Sales}}{\text{Fixed assets}}$$

$$\text{On cost of sales basis} = \frac{3,80,000}{10,00,000} = 0.38 \text{ times}$$

$$\text{On sales basis} = \frac{4,80,000}{10,00,000} = 0.48 \text{ times}$$

$$(3) \text{ Debtors turnover ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts receivable}}$$

$$\text{Credit sales} = \text{Total sales} - \text{Cash sales} - \text{Sales returns}$$

$$\text{Net credit sales} = 5,00,000 - 40,000 - 20,000 = 4,40,000$$

$$\text{Accounts receivable} = \text{Debtors} + \text{Bills receivable}$$

$$= 80,000 + 20,000 = 1,00,000$$

Closing receivables alone are used in the absence of opening figures.

$$\text{Debtors turnover ratio} = \frac{4,40,000}{1,00,000} = 4.4 \text{ times}$$

$$(4) \text{ Debtors collection period} = \frac{\text{Months in a year}}{\text{Debtors turnover}}$$

$$= \frac{12 \text{ months}}{4.4} = 2.73 \text{ months}$$

(or)

$$= \frac{\text{Days in the year}}{\text{Debtors turnover}}$$

$$= \frac{365}{4.4} = 83 \text{ days}$$

$$(5) \text{ Accounts payable turnover} = \frac{\text{Credit Purchases}}{\text{Average Accounts payable}}$$

$$\text{Credit purchases} = \text{Purchases} - \text{Purchase returns} - \text{Cash purchases}$$

$$= \text{Rs. } 3,00,000 - 10,000 - 50,000$$

$$= \text{Rs. } 2,40,000$$

$$\text{Accounts payable} = \text{Creditors} + \text{Bills payable}$$

$$= 60,000 + 20,000$$

$$= 80,000$$

$$\text{Accounts payable turnover} = \frac{2,40,000}{80,000} = 3 \text{ times}$$

(6) Accounts payable period (or) Debt payment period

$$\begin{aligned}
 &= \frac{\text{Months in a year}}{\text{Accounts payable turnover}} \\
 &= \frac{12}{3} = 4 \text{ months} \\
 (\text{or}) \quad &= \frac{\text{Days in the year}}{\text{Accounts payable turnover}} = \\
 &= \frac{365}{3} = 122 \text{ days}
 \end{aligned}$$

Note: Reserve for doubtful debts and reserve for discount on creditors are not relevant for any ratio and should be ignored.

(C) FINANCIAL OR SOLVENCY RATIOS**Illustration 18**

You are given the following information:

	Rs.
Cash	18,000
Debtors	1,42,000
Closing stock	1,80,000
Bills payable	27,000
Creditors	50,000
Outstanding expenses	15,000
Tax payable	75,000

Calculate (a) Current ratio (b) Liquidity ratio (c) Absolute liquidity ratio

[Madras, BCom., BBA, etc., April 2008]

[Madurai Kamaraj, B.Com., April 1993]

Solution:

$$\text{(a) Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Current assets	Rs.
Cash	18,000
Debtors	1,42,000
Closing stock	1,80,000
Total	<u>3,40,000</u>

Current liabilities	Rs.
Bills payable	27,000
Creditors	50,000
Outstanding expenses	15,000
Tax payable	75,000
Total	<u>1,67,000</u>

6.36

(c) Number of units to be sold to make a net income of 10% on sales

If 'x' is number of units:

$$20x = \text{Fixed cost} + \text{Variable cost} + \text{Profit}$$

$$20x = 79,200 + 14x + 2x$$

$$20x - 16x = 79,200$$

$$x = \frac{79,200}{4}$$

$$= 19,800 \text{ units}$$

$$\text{Proof: Sales} = 19,800 \times 20 = 396,000$$

$$\text{Less: Variable cost } 19,800 \times 14 = 277,200$$

$$\text{Contribution} = 1,18,800$$

$$\text{Less: Fixed cost} = 79,200$$

$$\text{Profit} = 39,600$$

$$\text{Profit as a \% of sales} = \frac{39,600}{396,000} \times 100 = 10\%$$

Illustration 10

From the following information relating to Palani Bros. Ltd., you are required to find out

(a) P/V Ratio (b) Break even point (c) Profit (d) Margin of safety (e) Volume of sales to earn profit of Rs. 6,000.

	Rs.
Total fixed costs	4,500
Total variable cost	7,500
Total sales	15,000

[Madras, 1st M.Com.(KCA2A) April 2010; B.Com (AF), B.Com(CS), B.Com (Gen)

April 2008; B.Com, BBA. etc. Nov. 2007; 1st M.Com, Nov. 2005; BBA

Solution: (old) Nov. 2006; B.Com(CS) April 2006; B.Com Oct. 2000]

Marginal cost and Contribution statement

Particulars	Amount Rs.
Sales	15,000
Less: Variable cost	7,500
Contribution	7,500
Less: Fixed cost	4,500
Profit	3,000

$$(a) \text{ P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{7,500}{15,000} \times 100 = 50\%$$

Illustration 9

From the following information, calculate

(a) Break-even point

(b) Number of units that must be sold to earn a profit of Rs. 60,000, per year.

(c) Number of units that must be sold to earn a net income of 10% on sales.

Sales price — Rs. 20 per unit.

Variable cost — Rs. 14 per unit

Fixed cost — Rs. 79,200

[Madras, MCA (PCE3A) Nov. 2010; B.Com., (ICE) Oct. 2008;

M.Com. (ICE) Oct. 1989]

solution:

Contribution per unit

$$\begin{aligned} &= \text{Sales price per unit} - \text{Variable cost per unit} \\ &= 20 - 14 = 6 \end{aligned}$$

P/V Ratio

$$= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{6}{20} \times 100 = 30\%$$

(a) Break even point in units

$$\begin{aligned} &= \frac{\text{Fixed expenses}}{\text{Contribution per unit}} \\ &= \frac{79,200}{6} = 13,200 \text{ units} \end{aligned}$$

Break even point (in rupees)

$$\begin{aligned} &= \frac{\text{Fixed expenses}}{\text{P / V Ratio}} \\ &= \frac{79,200}{30\%} \\ &= \text{Rs. } 2,64,000 \end{aligned}$$

(b) Number of units to be sold to make a profit of Rs. 60,000 per year:

Required sales

$$= \frac{\text{Fixed expenses} + \text{Required profit}}{\text{P / V Ratio}}$$

$$= \frac{79,200 + 60,000}{30\%}$$

$$= \text{Rs. } 4,64,000$$

Units

$$= \frac{4,64,000}{\text{Selling price}}$$

$$= \frac{4,64,000}{20}$$

$$= 23,200 \text{ units}$$

$$\text{Break even point} = \frac{20,000}{25\%} = \text{Rs. } 80,000$$

(c) Sales required to earn profit of Rs. 40,000

$$\begin{aligned}\text{Required sales} &= \frac{\text{Required profit} + \text{Fixed cost}}{\text{P / V Ratio}} \\ &= \frac{40,000 + 20,000}{25\%} = \text{Rs. } 2,40,000\end{aligned}$$

(d) Fixed expenses = Rs. 20,000 (as already calculated)

(e) Profit when sales are Rs. 1,20,000

$$\begin{aligned}\text{Contribution} &= \text{Sales} \times \text{P / V Ratio} \\ &= 1,20,000 \times \frac{25}{100} = \text{Rs. } 30,000\end{aligned}$$

$$\begin{aligned}\text{Profit} &= \text{Contribution} - \text{Fixed cost} \\ &= 30,000 - 20,000 \\ &= \text{Rs. } 10,000\end{aligned}$$

Illustration 18

A.G. Ltd. furnished you the following related to the year 1996.

	<i>First half of the year</i> Rs.	<i>Second half of the year</i> Rs.
Sales	45,000	50,000
Total cost	40,000	43,000

Assuming that there is no change in prices and variable cost and that the fixed expenses are incurred equally in the 2 half year periods, calculate for the year 1996:

- (a) The profit volume ratio
- (b) Fixed expenses
- (c) Break even sales and
- (d) % of margin of safety.

[Madras, B.Com (old) Nov. 2008; B.Com (PZH) Nov. 2007;
1st M.Com. (CA2A) April 2010; Nov. 2006; M.Com. (ICE) Oct. 1997]

(2-C) Cost volume profit analysis

When two consecutive periods figures are given

Illustration 17

The sales turnover and profit during two years were as follows:

Year	Sales Rs.	Profit Rs.
2007	1,40,000	15,000
2008	1,60,000	20,000

Calculate :

- (a) P/V Ratio
- (b) Break-even point
- (c) Sales required to earn a profit of Rs. 40,000
- (d) Fixed expenses and
- (e) Profit when sales are Rs. 1,20,000

[Madras, Ist M.Com.(CA2A) Ap. 2009; B.Com(AF) April 2008;
(Modified); B.Com., April 2001 (Old)]

Solution :

When sales and profit or sales and cost of two periods are given, the P/V Ratio is obtained by using the 'Change formulae'.

Fixed cost can be found by ascertaining the contribution of one of the periods given by multiplying sales with P/V Ratio. Then, contribution – Profit can reveal the fixed cost.

Ascertaining P/V ratio using the change formula and finding fixed cost are the essential requirements in these types of problems.

(a) *P/V Ratio*

$$= \frac{\text{Change in profit}}{\text{Change in sales}} \times 100$$

Change in profit

$$= 20,000 - 15,000 = \text{Rs. } 5,000$$

Change in sales

$$= 1,60,000 - 1,40,000 = \text{Rs. } 20,000$$

∴ P/V Ratio

$$= \frac{5,000}{20,000} \times 100 = 25\%$$

(b) *Break even point*

$$= \frac{\text{Fixed expenses}}{\text{P / V Ratio}}$$

Fixed expenses

$$= \text{Contribution - Profit}$$

Contribution

$$= \text{Sales} \times \text{P / V Ratio}$$

Using 2007 sales, contribution = $1,40,000 \times \frac{25}{100} = \text{Rs. } 35,000$

Fixed expenses

$$= 35,000 - 15,000 = \text{Rs. } 20,000$$

Note: The same fixed cost can be obtained using 2008 sales also.

$$\frac{1000}{50} \times 75 = 1500; \quad \frac{1500}{75} \times 100 = 2000$$

Budgeting and Budgetary Control

(J) Flexible Budget

Illustration 16

Draw up a flexible budget for production at 75% and 100% capacity on the basis of the following data for a 50% activity.

	Per unit Rs.	$\frac{2000}{2000} = 1$
Materials	$\frac{50,000 \times 40}{100} = 2000$	100
Labour	$\frac{2000}{100} = 20$	50
Variable expenses (direct)	10	
Administrative expenses (50% fixed)	40,000	
Selling and distribution expenses (60% fixed)	50,000	
Present production (50% activity):	1,000 units	

[Madras, BCA., Nov. 2010; B.Com(ICE) Oct. 2008; B.Com,

B.B.A., etc. April 2008]

$$v.C \quad 40000 \times 50\% = 20,000$$

Solution: $4000 \times 75\% = 30,000$

Flexible Budget

$$40000 \times \frac{100}{100} = 40,000$$

Particulars	Capacity Levels					
	50% 1,000 units		75% 1,500 units		100% 2,000 units	
	Per unit Rs. P.	Total Rs.	Per unit Rs. P.	Total Rs.	Per unit Rs. P.	Total Rs.
Materials	100	1,00,000	100.00	1,50,000	100	2,00,000
Labour	50	50,000	50.00	75,000	50	1,00,000
Variable expenses	10	10,000	10.00	15,000	10	20,000
Prime cost	160	1,60,000	160.00	2,40,000	160	3,20,000
Administration expenses:						
Variable (50%)	20	20,000	20.00	30,000	20	40,000
Fixed (50%)	20	20,000	13.33	20,000	10	20,000
Cost of production	200	2,00,000	193.33	2,90,000	190	3,80,000
Selling and Distribution expenses:						
Variable (40%)	20	20,000	20.00	30,000	20	40,000
Fixed (60%)	30	30,000	20.00	30,000	15	30,000
Total cost	250	2,50,000	233.33	3,50,000	225	4,50,000

Note: (1) Variable costs per unit remain constant at all the capacity levels.

Fixed costs remain constant in total at all the capacity levels.

(2) The effect of constant fixed cost is that the cost per unit goes on decreasing with every increase in capacity level. However, beyond 100% capacity level, fixed costs also may change.

Illustration 17

The cost of an article at a capacity level of 10,000 units is given under A below. For a variation in capacity above or below this level, the individual expenses vary as indicated in B below:

7.38

(3) Cash collections for sales

60% collection for April sales	$90,000 \times \frac{60}{100}$	54,000
20% collection for March sales	$108,000 \times \frac{20}{100}$	21,600
20% collection for February sales	$99,000 \times \frac{20}{100}$	19,800
Total cash collected for sales		<u>95,400</u>

Credit sales collections (or) collection from debtors = $21,600 + 19,800 = 41,400$

(i) Fixed Budget — Master budget

Illustration 15

A company which supplies its output on contract basis as component to an assembling firm has a contract to supply 10,000 units of its only product during 1999. The following were the budgeted expenses and revenue.

Material	Rs. 15 per unit
Wages	Rs. 10 per unit
Works expenses - (Fixed)	Rs. 40,000
Variable	Rs. 4 per unit
General expenses (all fixed)	Rs. 60,000

Profit is 20% on sale price.

Prepare the budget for 1999 showing the costs and profit.

[Madras B.Com., April 2004; B.B.A. (ICE) Oct. 2004]

Solution:

Master Budget
Output 10,000 units

Particulars	Total Rs.	Per unit
Materials	1,50,000	15.00
Wages	1,00,000	10.00
Prime cost	2,50,000	25.00
Add: Works expenses : Fixed	40,000	4.00
Variable	40,000	4.00
Works cost	3,30,000	33.00
Add: General expenses	60,000	6.00
Total cost	3,90,000	39.00
Add: Profit $3,90,000 \times \frac{20}{(100 - 20)}$	97,500	9.75
Sales	<u>4,87,500</u>	<u>48.75</u>

For example
 Sale is 100 Profit 20
 Cost = 100 - 20 = 80
 Profit 20 Cost
 20/80 = 1/4 (25)
 25%

(D) Production Budget**Illustration 6**

You are required to prepare a production budget for the half year ending June 2000 from the following information:

<i>Product</i>	<i>Budgeted sales quantity</i>	<i>Actual stock on 31-12-99.</i>	<i>Desired stock on 30-6-2000</i>
	<i>units</i>	<i>units</i>	<i>units</i>
S	20,000	4,000	5,000
T	50,000	6,000	10,000

Solution:

[Madras, B.Com., (AF) Nov. 2008; BBA (Sem) April 2006]

Production Budget for the half year ending 30-6-2000

<i>Particulars</i>	<i>Products</i>		<i>Total</i>
	<i>S units</i>	<i>T units</i>	
Sales (Budgeted)	20,000	50,000	70,000
Add: Closing stock (desired) as on 30-6-2000	5,000	10,000	15,000
	25,000	60,000	85,000
Less: Opening stock as on 1-1-2000	4,000	6,000	10,000
Quantity to be produced	21,000	54,000	75,000

Note: (1) Production = Estimated sales + Desired closing stock – Estimated opening stock

The formula is presented in the form of a statement. Horizontally different products can be shown, with a total column at the end

(2) If production costs are available, they may be incorporated into the production budget. In that case, it will be a 'cost of production budget'.

(3) If production is planned month wise, or week wise or quarter wise, the production budget can be shown with columns for each month or quarter, horizontally (See Illustrations 7 & 8).

Illustration 7

Lakshmanan Ltd. plans to sell 1,10,000 units of a certain product line in the first fiscal quarter, 1,20,000 units in the second quarter, 1,30,000 units in the third quarter, 1,50,000 units in the fourth quarter and 1,40,000 units in the fifth quarter. At the beginning of the first quarter of the current year, there are 14,000 units of the product in stock. At the end of each quarter, the company plans to have an inventory equal to one-fifth of the sales for the next fiscal quarter. How many units must be manufactured in each quarter of the current year?

[Madras, 1st M.Com. (KCA2A) April 2005; B.Com.,

BBA etc., April 2007; M.Com. April '95]

ILLUSTRATIONS

(1) Preparation of Schedule of changes in working capital (or) Working Capital Statement

Illustration 1

The Balance Sheets of Alacrity Ltd. at the end of 1993 and 1994 are given below. You are required to prepare a schedule of changes in working capital.

<i>Liabilities</i>	<i>1993 Rs.</i>	<i>1994 Rs.</i>	<i>Assets</i>	<i>1993 Rs.</i>	<i>1994 Rs.</i>
Share capital	1,00,000	1,50,000	Land	1,00,000	1,00,000
Share premium	—	5,000	Plant at cost	1,04,000	1,00,000
General reserve	50,000	60,000	Furniture at cost	7,000	9,000
P & L A/c	10,000	17,000	Investments at cost	60,000	80,000
5% Debentures	70,000	50,000	Debtors	30,000	70,000
Provision for depreciation on plant	50,000	56,000	Stock	60,000	65,000
Provision for depreciation on furniture	5,000	6,000	Cash	30,000	45,000
Provision for taxation	20,000	30,000			
Creditors	86,000	95,000			
	<u>3,91,000</u>	<u>4,69,000</u>		<u>3,91,000</u>	<u>4,69,000</u>

[Madras, B.A. Corp. C & M, March 96]

Solution:

Schedule of changes in working capital

<i>Particulars</i>	<i>1993 Rs.</i>	<i>1994 Rs.</i>	<i>Changes in working capital</i>	
			<i>Increase Rs.</i>	<i>Decrease Rs.</i>
<i>Current Assets:</i>				
Debtors	30,000	70,000	40,000	—
Stock	60,000	65,000	5,000	—
Cash	30,000	45,000	15,000	—
Total (A)	<u>1,20,000</u>	<u>1,80,000</u>		
<i>Current Liabilities :</i>				
Creditors	86,000	95,000	—	9,000
Total (B)	<u>86,000</u>	<u>95,000</u>		
Working capital (A - B)	34,000	85,000		
Increase in working capital	51,000	—		51,000
	<u>85,000</u>	<u>85,000</u>	<u>60,000</u>	<u>60,000</u>

Note: (1) Provision for taxation is treated as a non current liability and is not shown in the above schedule.

(2) 'Schedule of changes in working capital' may also be called 'Working capital statement', or 'statement of changes in working capital'.

4.30

(4) Simple Funds Flow Statements

Illustration 10

From the following Balance Sheets, prepare a statement showing flow of funds.

Balance Sheets

Liabilities	31-12-91 Rs.	31-12-92 Rs.	Assets	31-12-91 Rs.	31-12-92 Rs.
Share capital	2,00,000	2,50,000	Land	50,000	66,000
Retained earnings	10,000	23,000	Stock	80,000	90,000
Creditors	70,000	45,000	Debtors	1,20,000	1,15,000
	<u>2,80,000</u>	<u>3,18,000</u>	Cash	30,000	47,000
				<u>2,80,000</u>	<u>3,18,000</u>

[Madras, B.C.A. (Nov. 2005); M.Com. (ICE), May 1994]

Solution:

Funds Flow Statement for the year ending 31-12-92

Particulars	Rs.	Rs.
<i>Sources of funds</i>		
Funds from operations ($23,000 - 10,000$)	13,000	
Issue of shares ($2,50,000 - 2,00,000$)	<u>50,000</u>	
Total Sources (A)		63,000
<i>Applications of Funds</i>		
Land purchased ($66,000 - 50,000$)	16,000	
Total Applications (B)		16,000
Increase in working capital (A - B)		47,000

Note: Increase in retained earnings is taken as Funds From Operations, in the absence of further details.

Funds Flow Statement can also be prepared in the account form as given below. However, the statement form used above is preferable.

Funds Flow Statement for the year ending 31-12-1992

Sources of Funds	Rs.	Applications of Funds	Rs.
Funds from operations ($23,000 - 10,000$)	13,000	Land purchased ($66,000 - 50,000$)	16,000
Issue of shares ($2,50,000 - 2,00,000$)	50,000	Increasing in working capital (Bal. fig.)	47,000
	<u>63,000</u>		<u>63,000</u>

Solution:

$$\text{Absorption rate per unit of output} = \frac{\text{Indirect expenses}}{\text{Units of output}}$$

$$\begin{aligned}\text{Indirect expenses during 2010} &= \text{Rs. } 1,00,000 \\ \text{Output during the year} &= 25,000 \text{ units}\end{aligned}$$

$$\therefore \text{Overhead absorption rate per unit} = \frac{1,00,000}{25,000} = \text{Rs. } 4 \text{ per unit}$$

(E) Labour hour rate method**Illustration 19**

The production overhead of department A-12 in a factory is budgeted at Rs. 80,000. It is anticipated that the labour hours worked during the same period will be 10,000 hours. Calculate the labour hour rate for the purpose of overhead absorption.

Solution:

$$\text{Labour hour rate} = \frac{\text{Production overhead (Budgeted or Actual)}}{\text{Labour hours (Estimated or Actual)}}$$

$$\text{Budgeted production overhead} = \text{Rs. } 80,000$$

$$\text{Anticipated labour hours} = 10,000 \text{ hours}$$

$$\therefore \text{Labour hour rate} = \frac{80,000}{10,000} = \text{Rs. } 8 \text{ per hour}$$

(F) Machine hour rate method**Illustration 20**

During February 2007, works overhead incurred in a factory was Rs. 40,000. The machine hours worked during the month were 8,000 hours. Determine the machine hour rate to be charged to the output to recover the works overhead.

[Bharathiar, B.Com(E.Com) Nov. 2007]

Solution:

$$\text{Machine hour rate} = \frac{\text{Works overhead (Budgeted or Actual)}}{\text{Machine hours (Estimated or Actual)}}$$

$$\text{Works overhead incurred} = \text{Rs. } 40,000$$

$$\text{Machine hours worked} = 8,000 \text{ hours}$$

$$\therefore \text{Machine hour rate} = \frac{40,000}{8,000} = \text{Rs. } 5 \text{ per hour}$$

I. BASES OF APPORTIONMENT

Illustration 1

Indicate the basis you would adopt for apportionment of the following items of overhead expenses to different departments.

- (a) Factory rent (b) Factory lighting (c) Power
- (d) Depreciation of plant and machinery (e) Insurance of plant and machinery and fire insurance of stock.
- (f) Welfare expenses (g) Material handling charges
- (h) Indirect material (i) Indirect wages (j) Supervision (k) Repairs to plant
- (l) Insurance of building (m) Staff recreation (n) Canteen expenses (o) Creche expenses (p) Employer's contribution to E.S.I (q) Employer's contribution to P.F. (r) Stores expenses (s) Sundry expenses.

Solution:**Bases for Apportionment of overhead expenses**

Expenses	Basis of Apportionment
(a) Factory Rent	Floor area
(b) Factory Lighting	Light points, Floor area
(C) Power	K.W.H (Kilowatt hours); HP (Horse power) of plant
(d) Depreciation of plant & machinery	Machine hours; Value of plant.
(e) Insurance of plant and machinery	Insurable value of plant and machinery
Insurance of stock	Value of stock
(f) Welfare expenses	Number of employees
(g) Material handling charges	Value of material
(h) Indirect material	Direct material
(i) Indirect wages	Direct wages
(j) Supervision	Number of employees
(k) Repairs to plant	Value of plant
(l) Insurance of building	Value of building, Floor area
(m) Staff recreation	No. of employees
(n) Canteen expenses	No. of employees
(o) Creche expenses	No. of female employees
(p) Employer's contribution to E.S.I	Wages of each department, No. of employees
(q) Employer's contribution to PF	Wages of each department, No. of employees
(r) Stores expenses	Materials consumed by each department
(s) Sundry expenses	Labour hours; Direct wages

II PRIMARY APPORTIONMENT OF OVERHEAD EXPENSES

Illustration 2

Kumaresh Ltd., has three production departments 'A', 'B' and 'C' and two service departments 'D' and 'E'. The following figures are extracted from the records of the company:

	Rs.
Rent and rates	5,000
Indirect wages	1,500
Depreciation of machinery	10,000
General lighting	600
Power	1,500
Sundries	10,000

Following further details are available:

	<i>Total</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
Floor space in square feet	10,000	2,000	2,500	3,000	2,000	500
Light points	60	10	15	20	10	5
Direct wages (Rs.)	10,000	3,000	2,000	3,000	1,500	500
H.P of machines	150	60	30	50	10	-
Value of machinery (Rs.)	2,50,000	60,000	80,000	1,00,000	5,000	5,000

Apportion the cost to various departments on the most equitable basis by preparing a primary departmental distribution summary.

[Madras, B.Com(Gen) Nov. 2007]

[Delhi B.com (Hon)., 1993]

Solution:**Primary overhead distribution summary**

Item	Basis of Apportionment	Production Depts.			Service Depts.		Total
		Total Rs.	A Rs.	B Rs.	C Rs.	D Rs.	
Rent and rates	Floor space 4:5:6:4:1	5,000	1,000	1,250	1,500	1,000	250
Indirect wages	Direct wages 6:4:6:3:1	1,500	450	300	450	225	75
Depreciation of machinery	Value of machinery 12:16:20:1:1	10,000	2,400	3,200	4,000	200	200
General lighting	Light points 2:3:4:2:1	600	100	150	200	100	50
Power	H.P. of machines 6:3:5:1:-	1,500	600	300	500	100	-
Sundries	Direct wages 6:4:6:3:1	10,000	3,000	2,000	3,000	1,500	500
Direct wages	Allocation	2,000	-	-	-	1,500	500
Total overhead		30,600	7,550	7,200	9,650	4,625	1,575

Note: Direct wages of service departments are also included in the distribution summary since they should also be reapportioned to the production departments and then finally be absorbed by the output. Ignoring the direct wages of service departments will result in 'unabsorbed expenses'

Illustration 3

Krishna producing concern is divided into four departments. 'A', 'B', 'C' are production departments and 'D' is a service department. The actual expenses for a period are as follows:

	Rs.
Rent	10,000
Repairs to plant	6,000
Depreciation of plant	4,500
Lighting expenses	1,000
Supervisory expenses	15,000
Fire insurance (on stock)	5,000
Power	9,000
Employer's liability for insurance	1,500

5.41

Note:(1) ESI (Employees State Insurance) and P.F (Provident fund) contributions made by employer are usually divided on the basis of department wages. However, employer's liability for insurance is assumed to be different from his legal contribution to ESI. So it is divided on the basis of No. of employees.

(2) Power is divided on plant value basis because the horse power or K.W.H. of the plant and machinery is not given.

(3) Wages of service department should also be included because they should also be re-apportioned to the production departments and finally absorbed by the output.

III SECONDARY APPORTIONMENT (OR)

SECONDARY DISTRIBUTION OF OVERHEADS

(A) Direct Reapportionment

Illustration 4

Calculate the overhead allocable to production departments A and B from the following:

There are two service departments X and Y. X renders service to A and B in the ratio of 3 : 2 and Y renders service to A and B in the ratio of 9 : 1. Overhead as per primary overhead distribution is:

A - Rs. 49,800; B - Rs. 29,600; X - Rs. 15,600; Y - Rs. 10,800.

[Bharathiar, B.Com(E.Com) Nov. 2007]

Solution:

Secondary overhead Distribution summary

Particulars	Total	Production Depts.		Service Depts.	
		A Rs.	B Rs.	X Rs.	Y Rs.
Overhead as per Primary distribution	1,05,800	49,800	29,600	15,600	10,800
Service department 'X' O.H. 3 : 2 to A & B	-	9,360	6,240	(-15,600)	
Service department 'Y' O.H. 9 : 1 to A & B	-	9,720	1,080	-	(10,800)
Total overhead of Production departments	1,05,800	68,880	36,920	-	-