

CHAPTER 9

Ratio Analysis

Introduction

The analysis of the financial statements and interpretations of financial results of a particular period of operations with the help of 'ratio' is termed as "ratio analysis." Ratio analysis used to determine the financial soundness of a business concern. Alexander Wall designed a system of ratio analysis and presented it in useful form in the year 1909.

Meaning and Definition

The term 'ratio' refers to the mathematical relationship between any two inter-related variables. In other words, it establishes relationship between two items expressed in quantitative form.

According J. Batty, Ratio can be defined as "the term accounting ratio is used to describe significant relationships which exist between figures shown in a balance sheet and profit and loss account in a budgetary control system or any other part of the accounting management."

Ratio can be used in the form of (1) percentage (20%) (2) Quotient (say 10) and (3) Rates. In other words, it can be expressed as a to b ; $a : b$ (a is to b) or as a simple fraction, integer and decimal. A ratio is calculated by dividing one item or figure by another item or figure.

Analysis or Interpretations of Ratios

The analysis or interpretations in question may be of various types. The following approaches are usually found to exist:

- (a) Interpretation or Analysis of an Individual (or) Single ratio.
- (b) Interpretation or Analysis by referring to a group of ratios.
- (c) Interpretation or Analysis of ratios by trend.
- (d) Interpretations or Analysis by inter-firm comparison.

Principles of Ratio Selection

The following principles should be considered before selecting the ratio:

- (1) Ratio should be logically inter-related.
- (2) Pseudo ratios should be avoided.
- (3) Ratio must measure a material factor of business.
- (4) Cost of obtaining information should be borne in mind.
- (5) Ratio should be in minimum numbers.
- (6) Ratio should be facilities comparable.

Advantages of Ratio Analysis

Ratio analysis is necessary to establish the relationship between two accounting figures to highlight the significant information to the management or users who can analyse the business situation and to monitor their performance in a meaningful way. The following are the advantages of ratio analysis:

- (1) It facilitates the accounting information to be summarized and simplified in a required form.
- (2) It highlights the inter-relationship between the facts and figures of various segments of business.
- (3) Ratio analysis helps to remove all type of wastages and inefficiencies.
- (4) It provides necessary information to the management to take prompt decision relating to business.
- (5) It helps to the management for effectively discharge its functions such as planning, organizing, controlling, directing and forecasting.
- (6) Ratio analysis reveals profitable and unprofitable activities. Thus, the management is able to concentrate on unprofitable activities and consider to improve the efficiency.
- (7) Ratio analysis is used as a measuring rod for effective control of performance of business activities.
- (8) Ratios are an effective means of communication and informing about financial soundness made by the business concern to the proprietors, investors, creditors and other parties.
- (9) Ratio analysis is an effective tool which is used for measuring the operating results of the enterprises.
- (10) It facilitates control over the operation as well as resources of the business.
- (11) Effective co-operation can be achieved through ratio analysis.
- (12) Ratio analysis provides all assistance to the management to fix responsibilities.
- (13) Ratio analysis helps to determine the performance of liquidity, profitability and solvency position of the business concern.

Limitations of Ratio Analysis

Ratio analysis is one of the important techniques of determining the performance of financial strength and weakness of a firm. Though ratio analysis is relevant and useful technique for the business concern, the analysis is based on the information available in the financial statements. There are some situations, where ratios are misused, it may lead the management to wrong direction. The ratio analysis suffers from the following limitations:

- (1) Ratio analysis is used on the basis of financial statements. Number of limitations of financial statements may affect the accuracy or quality of ratio analysis.
- (2) Ratio analysis heavily depends on quantitative facts and figures and it ignores qualitative data. Therefore this may limit accuracy.
- (3) Ratio analysis is a poor measure of a firm's performance due to lack of adequate standards laid for ideal ratios.
- (4) It is not a substitute for analysis of financial statements. It is merely used as a tool for measuring the performance of business activities.
- (5) Ratio analysis clearly has some latitude for window dressing.
- (6) It makes comparison of ratios between companies which is questionable due to differences in methods of accounting operation and financing.
- (7) Ratio analysis does not consider the change in price level, as such, these ratio will not help in drawing meaningful inferences.

CLASSIFICATION OF RATIOS

Accounting Ratios are classified on the basis of the different parties interested in making use of the ratios. A very large number of accounting ratios are used for the purpose of determining the financial position of a concern for different purposes. Ratios may be broadly classified in to:

- (1) Classification of Ratios on the basis of Balance Sheet.
- (2) Classification of Ratios on the basis of Profit and Loss Account.
- (3) Classification of Ratios on the basis of Mixed Statement (or) Balance Sheet and Profit and Loss Account.

This classification further grouped in to:

- I. Liquidity Ratios
- II. Profitability Ratios
- III. Turnover Ratios
- IV. Solvency Ratios
- V. Over all Profitability Ratios

These classifications are discussed hereunder :

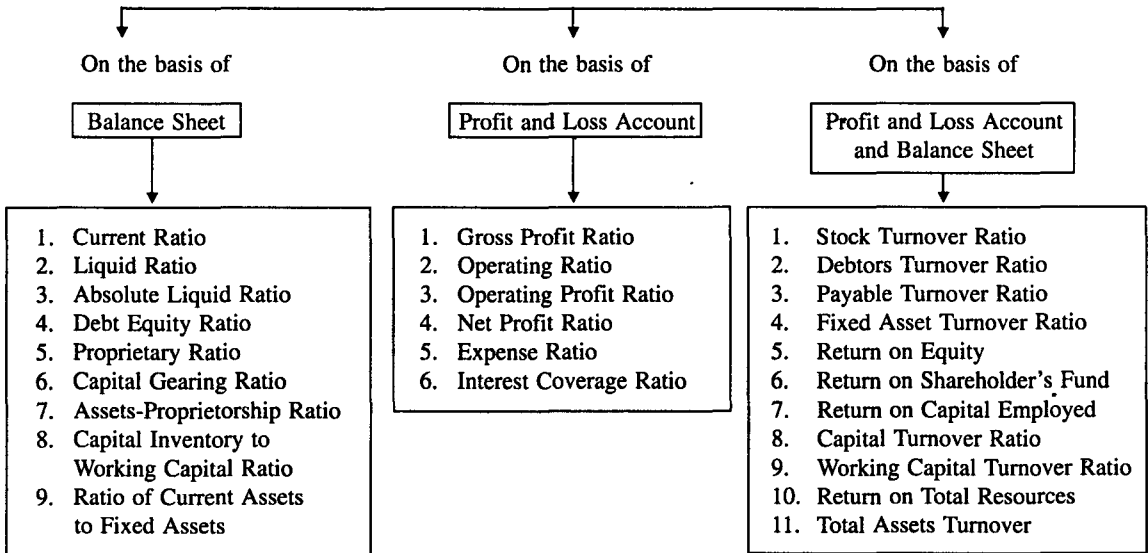
1. Classification of Ratios on the basis of Balance Sheet: Balance sheet ratios which establish the relationship between two balance sheet items. For example, Current Ratio, Fixed Asset Ratio, Capital Gearing Ratio and Liquidity Ratio etc.

2. Classification on the basis of Income Statements: These ratios deal with the relationship between two items or two group of items of the income statement or profit and loss account. For example, Gross Profit Ratio, Operating Ratio, Operating Profit Ratio, and Net Profit Ratio etc.

3. Classification on the basis of Mixed Statements: These ratios also known as Composite or Mixed Ratios or Inter Statement Ratios. The inter statement ratios which deal with relationship between the item of profit and loss account and item of balance sheet. For example, Return on Investment Ratio, Net Profit to Total Asset Ratio, Creditor's Turnover Ratio, Earning Per Share Ratio and Price Earning Ratio etc.

A chart for classification of ratios by statement is given below showing clearly the types of ratios may be broadly classified on the basis of Income Statement and Balance Sheet.

Classification of Ratios by Statement



I. LIQUIDITY RATIOS

Liquidity Ratios are also termed as Short-Term Solvency Ratios. The term liquidity means the extent of quick convertibility of assets in to money for paying obligation of short-term nature. Accordingly, liquidity ratios are useful in obtaining an indication of a firm's ability to meet its current liabilities, but it does not reveal how effectively the cash resources can be managed. To measure the liquidity of a firm, the following ratios are commonly used:

- (1) Current Ratio.
- (2) Quick Ratio (or) Acid Test or Liquid Ratio.
- (3) Absolute Liquid Ratio (or) Cash Position Ratio.

(1) Current Ratio

Current Ratio establishes the relationship between current Assets and current Liabilities. It attempts to measure the ability of a firm to meet its current obligations. In order to compute this ratio, the following formula is used :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The two basic components of this ratio are current assets and current liabilities. Current asset normally means assets which can be easily converted in to cash within a year's time. On the other hand, current liabilities represent those liabilities which are payable within a year. The following table represents the components of current assets and current liabilities in order to measure the current ratios :

Components of Current Assets and Current Liabilities

<i>Current Assets</i>	<i>Current Liabilities</i>
<ol style="list-style-type: none"> 1. Cash in Hand 2. Cash at Bank 3. Sundry Debtors 4. Bills Receivable 5. Marketable Securities (Short-Term) 6. Other Short-Term Investments 7. Inventories : <ol style="list-style-type: none"> (a) Stock of raw materials (b) Stock of work in progress (c) Stock of finished goods 	<ol style="list-style-type: none"> 1. Sundry Creditors (Accounts Payable) 2. Bills Payable 3. Outstanding and Accrued Expenses 4. Income Tax Payable 5. Short-Term Advances 6. Unpaid or Unclaimed Dividend 7. Bank Overdraft (Short-Term period)

Interpretation of Current Ratio: The ideal current ratio is 2:1. It indicates that current assets double the current liabilities is considered to be satisfactory. Higher value of current ratio indicates more liquid of the firm's ability to pay its current obligation in time. On the other hand, a low value of current ratio means that the firm may find it difficult to pay its current ratio as one which is generally recognized as the patriarch among ratios.

Advantages of Current Ratios:

- (1) Current ratio helps to measure the liquidity of a firm.
- (2) It represents general picture of the adequacy of the working capital position of a company.
- (3) It indicates liquidity of a company.
- (4) It represents a margin of safety, i.e., cushion of protection against current creditors.
- (5) It helps to measure the short-term financial position of a company or short-term solvency of a firm.

Disadvantages of Current Ratio:

- (1) Current ratios cannot be appropriate to all businesses it depends on many other factors.
- (2) Window dressing is another problem of current ratio, for example, overvaluation of closing stock.
- (3) It is a crude measure of a firm's liquidity only on the basis of quantity and not quality of current assets.

Calculation of Current Ratio:

Illustration: 1

The following information relates to Mishra & Co. for the year 2003, calculate current ratio:

Current Assets	Rs. 5,00,000
Current Liabilities	Rs. 2,00,000

Solution:

$$\begin{aligned} \text{Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\ &= \frac{5,00,000}{2,00,000} \\ &= 2.5 \text{ (or) } 2.5 : 1 \end{aligned}$$

The current ratio of 2.5 means that current assets are 2.5 times of current liabilities.

Illustration: 2**Calculate Current Ratio from the following Information**

<i>Liabilities</i>	<i>Rs.</i>	<i>Assets</i>	<i>Rs.</i>
Sundry creditors	40,000	Inventories	1,20,000
Bills payable	30,000	Sundry debtors	1,40,000
Dividend payable	36,000	Cash at Bank	40,000
Accrued expenses	14,000	Bills Receivable	60,000
Short-term advances	50,000	Prepaid expenses	20,000
Share Capital	1,50,000	Machinery	2,00,000
Debenture	2,00,000	Patents	50,000
		Land & Building	1,50,000

Solution:

$$\begin{aligned} \text{Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\ \text{Current Assets} &= \text{Rs. } 1,20,000 + 1,40,000 + 40,000 + 60,000 + 20,000 \\ &= \text{Rs. } 3,80,000 \\ \text{Current Liabilities} &= \text{Rs. } 40,000 + 30,000 + 36,000 + 14,000 + 50,000 \\ &= \text{Rs. } 1,70,000 \\ \text{Current Ratio} &= \frac{3,80,000}{1,70,000} \\ &= 2.24 \text{ (or) } 2.24 : 1 \end{aligned}$$

(2) Quick Ratio (or) Acid Test or Liquid Ratio

Quick Ratio also termed as Acid Test or Liquid Ratio. It is supplementary to the current ratio. The acid test ratio is a more severe and stringent test of a firm's ability to pay its short-term obligations as and when they become due. Quick Ratio establishes the relationship between the quick assets and current liabilities. In order to compute this ratio, the below presented formula is used :

$$\text{Liquid Ratio} = \frac{\text{Liquid Assets} \text{ (Current Assets - Stock and Prepaid Expenses)}}{\text{Current Liabilities}}$$

Quick Ratio can be calculated by two basic components of quick assets and current liabilities.

$$\text{Quick Assets} = \text{Current Assets} - (\text{Inventories} + \text{Prepaid expenses})$$

Current liabilities represent those liabilities which are payable within a year.

The ideal Quick Ratio of 1:1 is considered to be satisfactory. High Acid Test Ratio is an indication that the firm has relatively better position to meet its current obligation in time. On the other hand, a low value of quick ratio exhibiting that the firm's liquidity position is not good.

Advantages

- (1) Quick Ratio helps to measure the liquidity position of a firm.
- (2) It is used as a supplementary to the current ratio.
- (3) It is used to remove inherent defects of current ratio.

Illustration: 3

Calculate Quick Ratio from the information given below :

	Rs.
Current Assets	4,00,000
Current Liabilities	2,00,000
Inventories (stock)	25,000
Prepaid Expenses	25,000
Land and Building	4,00,000
Share Capital	3,00,000
Good Will	2,00,000

Solution:

$$\begin{aligned}
 \text{Quick Ratio} &= \frac{\text{Quick Assets}}{\text{Current Liabilities}} \\
 &= \frac{\text{Current Assets} - (\text{Inventories} + \text{Prepaid Expenses})}{\text{Current Liabilities}} \\
 &= \frac{\text{Rs. } 4,00,000 - (25,000 + 25,000)}{\text{Rs. } 2,00,000} \\
 &= \frac{\text{Rs. } 4,00,000 - 50,000}{\text{Rs. } 2,00,000} \\
 &= \frac{\text{Rs. } 3,50,000}{2,00,000} \\
 &= 1.75 \text{ (or) } 1.75 : 1
 \end{aligned}$$

(3) Absolute Liquid Ratio

Absolute Liquid Ratio is also called as Cash Position Ratio (or) Over Due Liability Ratio. This ratio established the relationship between the absolute liquid assets and current liabilities. Absolute Liquid Assets include cash in hand, cash at bank, and marketable securities or temporary investments. The optimum value for this ratio should be one, i.e., 1 : 2. It indicates that 50% worth absolute liquid assets are considered adequate to pay the 100% worth current liabilities in time. If the ratio is relatively lower than one, it represents that the company's day-to-day cash management is poor. If the ratio is considerably more than one, the absolute liquid ratio represents enough funds in the form of cash to meet its short-term

obligations in time. The Absolute Liquid Ratio can be calculated by dividing the total of the Absolute Liquid Assets by Total Current Liabilities. Thus,

$$\text{Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

Illustration: 4**Calculate Absolute Liquid Ratio from the following Information**

<i>Liabilities</i>	<i>Rs.</i>	<i>Assets</i>	<i>Rs.</i>
Bills Payable	30,000	Goodwill	2,00,000
Sundry Creditors	20,000	Land and Building	2,00,000
Share Capital	1,00,000	Inventories	50,000
Debenture	2,00,000	Cash in Hand	30,000
Bank Overdraft	25,000	Cash at Bank	20,000
		Sundry Debtors	50,000
		Bills Payable	75,000
		Marketable Securities	10,000

Solution:

$$\begin{aligned} \text{Absolute Liquid Ratio} &= \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}} \\ \text{Absolute Liquid Assets} &= \text{Cash in Hand} + \text{Cash at Bank} + \\ &\quad \text{Marketable Securities} \\ &= \text{Rs. } 30,000 + 20,000 + 10,000 \\ &= \text{Rs. } 60,000 \\ \text{Current Liabilities} &= \text{Rs. } 30,000 + 20,000 + 25,000 \\ &= \text{Rs. } 75,000 \\ \text{Absolute Liquid Ratio} &= \frac{60,000}{75,000} \\ &= 0.8 \end{aligned}$$

The ratio of 0.8 is quite satisfactory because, it is much higher than the optimum value of 50%.

Illustration: 5

You are given the following information :

	<i>Rs.</i>
Cash in Hand	10,000
Cash at Bank	15,000
Sundry Debtors	75,000
Stock	60,000
Bills Payable	25,000
Bills Receivable	30,000
Sundry Creditors	40,000
Outstanding Expenses	20,000
Prepaid Expenses	10,000
Dividend Payable	15,000

Land and Building	2,00,000
Goodwill	1,00,000
Calculate: (a) Current Ratio (b) Liquid Ratio (c) Absolute Liquidity Ratio	

Solution:

$$(a) \text{ Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets :	<i>Rs.</i>
Cash in Hand	10,000
Cash at Bank	15,000
Sundry Debtors	75,000
Stock	60,000
Bills Receivable	30,000
Prepaid Expenses	10,000
Total Current Assets	<u>Rs. 2,00,000</u>

Current Liabilities :	<i>Rs.</i>
Bills Payable	25,000
Sundry Creditors	40,000
Outstanding Expenses	20,000
Dividend Payable	15,000
Total Current Liabilities	<u>1,00,000</u>

$$\begin{aligned} \text{Current Ratio} &= \frac{\text{Rs. 2,00,000}}{\text{Rs. 1,00,000}} \\ &= 2 \text{ times (or) } 2:1 \end{aligned}$$

$$(b) \text{ Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

Liquid Assets	=	Current Assets – (Stock and Prepaid Expenses)
	=	Rs. 2,00,000 – (60,000 + 10,000)
	=	Rs. 2,00,000 – 70,000
	=	Rs. 1,30,000

$$\text{Liquid Ratio} = \frac{1,30,000}{1,00,000} = 1.3 \text{ times (or) } 1:3:1$$

$$(c) \text{ Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

Absolute Liquid Assets	=	Cash in hand + Cash at Bank + Marketable Securities
	=	Rs. 10,000 + 15,000 + Nil
	=	Rs. 25,000

$$\begin{aligned} \text{Absolute Liquid Ratio} &= \frac{25,000}{1,00,000} \\ &= 0.25 \end{aligned}$$

Illustration: 6

Given :

$$\begin{aligned} \text{Current Ratio} &= 2.6 \\ \text{Liquid Ratio} &= 1.4 \\ \text{Working Capital} &= \text{Rs. } 1,10,000 \end{aligned}$$

Calculate : (1) Current Assets (2) Current Liabilities (3) Liquid Assets and (4) Stock.

Solution:

Calculation of current assets and current liabilities :

$$\begin{aligned} \text{Working Capital} &= \text{Current Assets} - \text{Current Liabilities} \\ \text{Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (\text{or}) \\ &= \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2.6:1 \\ \text{Working Capital} &= \text{Current Assets} - \text{Current Liabilities} \\ \text{Working Capital} &= 2.6 - 1 \\ &= 1.6 \\ \text{Working Capital (Given)} &= 1,10,000 \\ \therefore 1.6 &= 1,10,000 \end{aligned}$$

$$(1) \text{ Current Assets} = 1,10,000 \times \frac{2.6}{1.6} = \text{Rs. } 1,78,750$$

$$(2) \text{ Current Liabilities} = 1,10,000 \times \frac{1}{1.6} = \text{Rs. } 68,750$$

(3) Calculation of Liquid Assets :

$$\begin{aligned} \text{Liquid Ratio (Given)} &= 1.4 \\ \text{Liquid Ratio} &= \frac{\text{Liquid Assets}}{\text{Current Liabilities}} \\ 1.4 &= \frac{\text{Liquid Assets}}{\text{Rs. } 68,750} \end{aligned}$$

$$\begin{aligned} \text{Liquid Assets} &= 68,750 \times 1.4 \\ &= \text{Rs. } 96,250 \end{aligned}$$

(4) Calculation of Stock :

$$\begin{aligned} \text{Liquid Assets} &= \text{Current Assets} - (\text{Stock} + \text{Prepaid Expenses}) \\ \text{Stock} &= \text{Current Assets} - \text{Liquid Assets} \\ &= \text{Rs. } 1,78,750 - \text{Rs. } 96,250 \\ &= \text{Rs. } 82,500 \end{aligned}$$

II. PROFITABILITY RATIOS

The term profitability means the profit earning capacity of any business activity. Thus, profit earning may be judged on the volume of profit margin of any activity and is calculated by subtracting costs from the total revenue accruing to a firm during a particular period. Profitability Ratio is used to measure the overall efficiency or performance of a business. Generally, a large number of ratios can also be used for determining the profitability as the same is related to sales or investments.

The following important profitability ratios are discussed below :

1. Gross Profit Ratio.
2. Operating Ratio.
3. Operating Profit Ratio.
4. Net Profit Ratio.
5. Return on Investment Ratio.
6. Return on Capital Employed Ratio.
7. Earning Per Share Ratio.
8. Dividend Payout Ratio.
9. Dividend Yield Ratio.
10. Price Earning Ratio.
11. Net Profit to Net Worth Ratio.

(1) Gross Profit Ratio

Gross Profit Ratio established the relationship between gross profit and net sales. This ratio is calculated by dividing the Gross Profit by Sales. It is usually indicated as percentage.

$$\begin{aligned} \text{Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100 \\ \frac{\text{Gross Profit}}{\text{Net Sales}} &= \frac{\text{Sales} - \text{Cost of Goods Sold}}{\text{Gross Sales} - \text{Sales Return (or) Return Inwards}} \end{aligned}$$

Higher Gross Profit Ratio is an indication that the firm has higher profitability. It also reflects the effective standard of performance of firm's business. Higher Gross Profit Ratio will be result of the following factors.

- (1) Increase in selling price, i.e., sales higher than cost of goods sold.
- (2) Decrease in cost of goods sold with selling price remaining constant.
- (3) Increase in selling price without any corresponding proportionate increase in cost.
- (4) Increase in the sales mix.

A low gross profit ratio generally indicates the result of the following factors :

- (1) Increase in cost of goods sold.
- (2) Decrease in selling price.

- (3) Decrease in sales volume.
- (4) High competition.
- (5) Decrease in sales mix.

Advantages

- (1) It helps to measure the relationship between gross profit and net sales.
- (2) It reflects the efficiency with which a firm produces its product.
- (3) This ratio tells the management, that a low gross profit ratio may indicate unfavourable purchasing and mark-up policies.
- (4) A low gross profit ratio also indicates the inability of the management to increase sales.

Illustration: 7

Calculate Gross Profit Ratio from the following figures :

	Rs.
Sales	5,00,000
Sales Return	50,000
Closing Stock	35,000
Opening Stock	70,000
Purchases	3,50,000

Solution:

$$\begin{aligned}
 \text{Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100 \\
 \text{Net Sales} &= \text{Sales} - \text{Sales Return} \\
 &= \text{Rs. } 5,00,000 - 50,000 \\
 &= \text{Rs. } 4,50,000 \\
 \text{Gross Profit} &= \text{Sales} - \text{Cost of Goods Sold} \\
 \text{Cost of goods sold} &= \text{Opening Stock} + \text{Purchase} - \text{Closing Stock} \\
 &= \text{Rs. } 70,000 + 3,50,000 - 35,000 \\
 &= \text{Rs. } 4,20,000 - 35,000 = \text{Rs. } 3,85,000 \\
 \text{Gross Profit} &= \text{Rs. } 4,50,000 - 3,85,000 = \text{Rs. } 65,000 \\
 \text{Gross Profit Ratio} &= \frac{65,000}{4,50,000} \times 100 \\
 &= 14.44 \%
 \end{aligned}$$

(2) Operating Ratio

Operating Ratio is calculated to measure the relationship between total operating expenses and sales. The total operating expenses is the sum total of cost of goods sold, office and administrative expenses and selling and distribution expenses. In other words, this ratio indicates a firm's ability to cover total operating expenses. In order to compute this ratio, the following formula is used :

$$\begin{aligned}
 \text{Operating Ratio} &= \frac{\text{Operating Cost}}{\text{Net Sales}} \times 100 \\
 \text{Operating Cost} &= \text{Cost of goods sold} + \text{Administrative Expenses} \\
 &\quad + \text{Selling and Distribution Expenses} \\
 \text{Net Sales} &= \text{Sales} - \text{Sales Return (or) Return Inwards.}
 \end{aligned}$$

Illustration: 8

Find out Operating Ratio :

Cost of goods sold	Rs. 4,00,000
Office and Administrative Expenses	Rs. 30,000
Selling and Distribution Expenses	Rs. 20,000
Sales	Rs. 6,00,000
Sales Return	Rs. 20,000

Solution:

$$\begin{aligned} \text{Operating Ratio} &= \frac{\text{Operating Cost}}{\text{Net Sales}} \times 100 \\ \text{Operating Cost} &= \text{Cost of goods sold} + \text{Administrative Expenses} \\ &+ \text{Selling and Distribution Expenses} \\ &= \text{Rs. 4,00,000} + 30,000 + 20,000 \\ &= \text{Rs. 4,50,000} \\ &= \text{Rs. 6,00,000} - 20,000 \\ &= \text{Rs. 5,80,000} \\ \text{Operating Ratio} &= \frac{4,50,000}{5,80,000} \times 100 \\ &= 77.58\% \end{aligned}$$

This ratio indicated that 77.58% of the net sales have been consumed by cost of goods sold, administrative expenses and selling and distribution expenses. The remaining 23.42% indicates a firm's ability to cover the interest charges, income tax payable and dividend payable.

(3) Operating Profit Ratio

Operating Profit Ratio indicates the operational efficiency of the firm and is a measure of the firm's ability to cover the total operating expenses. Operating Profit Ratio can be calculated as :

$$\begin{aligned} \text{Operating Profit Ratio} &= \frac{\text{Operating Profit}}{\text{Net Sales}} \times 100 \\ \text{Operating Profit} &= \text{Net Sales} - \text{Operating Cost} \\ &(\text{or}) \\ &= \text{Net Sales} - (\text{Cost of Goods Sold} + \text{Office} \\ &\text{and Administrative Expenses} + \text{Selling} \\ &\text{and Distribution Expenses}) \\ &(\text{or}) \\ &= \text{Gross Profit} - \text{Operating Expenses} \\ &(\text{or}) \\ &= \text{Net Profit} + \text{Non-Operating Expenses} - \\ &\text{Non-Operating Income.} \\ \text{Net Sales} &= \text{Sales} - \text{Sales Return (or) Return Inwards} \end{aligned}$$

Illustration: 9

From the following information given below, you are required to calculate Operating Profit Ratio :

	Rs.
Gross Sales	6,50,000
Sales Return	50,000
Opening Stock	25,000
Closing Stock	30,000
Purchases	4,10,000
Office and Administrative Expenses	50,000
Selling and Distribution Expenses	40,000

Solution:

Operating Profit Ratio	=	$\frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$
Operating Profit	=	Net Sales – Total Operating Cost
Net Sales	=	Gross Sales – Sales Return
	=	Rs. 6,50,000 – 50,000
	=	Rs. 6,00,000
Total Operating Cost	=	Cost of Goods Sold + Office and Administrative Expenses + Selling and Distribution Expenses
Cost of Goods sold	=	Opening Stock + Purchase – Closing Stock
	=	Rs. 25,000 + 4,10,000 – 30,000
	=	Rs. 4,05,000
Total Operating Expenses	=	Rs. 4,05,000 + 50,000 + 40,000
	=	Rs. 4,95,000
Operating Profit	=	Net Sales – Total Operating Expenses
	=	Rs. 6,00,000 – 4,95,000
	=	Rs. 1,05,000
Operating Profit Ratio	=	$\frac{1,05,000}{6,00,000} \times 100$
	=	17.5

Illustration: 10

Calculate Operating Profit Ratio from the following figures :

Net Sales	=	Rs. 4,00,000
Cost of Goods Sold	=	Rs. 3,00,000
Office and Administrative Expenses	=	Rs. 20,000
Selling and Distribution Expenses	=	Rs. 15,000

Solution:

Operating Profit Ratio	=	$\frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$
Operating Profit	=	Sales – Total Operating Cost
Total Operating Cost	=	Cost of goods sold + Office and Administrative Expenses + Selling And Distribution Expenses

$$\begin{aligned}
 &= \text{Rs. } 3,00,000 + 20,000 + 15,000 \\
 &= \text{Rs. } 3,35,000 \\
 \text{Operating Profit} &= \text{Rs. } 4,00,000 - 3,35,000 \\
 &= \text{Rs. } 65,000 \\
 \text{Operating Profit Ratio} &= \frac{65,000}{4,00,000} \times 100 \\
 &= 16.25 \%
 \end{aligned}$$

(4) Net Profit Ratio

Net Profit Ratio is also termed as Sales Margin Ratio (or) Profit Margin Ratio (or) Net Profit to Sales Ratio. This ratio reveals the firm's overall efficiency in operating the business. Net profit Ratio is used to measure the relationship between net profit (either before or after taxes) and sales. This ratio can be calculated by the following formula :

$$\text{Net Profit Ratio} = \frac{\text{Net Profit After Tax}}{\text{Net Sales}} \times 100$$

Net profit includes non-operating incomes and profits. Non-Operating Incomes such as dividend received, interest on investment, profit on sales of fixed assets, commission received, discount received etc. Profit or Sales Margin indicates margin available after deduction cost of production, other operating expenses, and income tax from the sales revenue. Higher Net Profit Ratio indicates the standard performance of the business concern.

Advantages

- (1) This is the best measure of profitability and liquidity.
- (2) It helps to measure overall operational efficiency of the business concern.
- (3) It facilitates to make or buy decisions.
- (4) It helps to determine the managerial efficiency to use a firm's resources to generate income on its invested capital.
- (5) Net profit Ratio is very much useful as a tool of investment evaluation.

Illustration: 11

From the following Trading and Profit and Loss Account of Ramesh & Co. for the year 31st Dec. 2003 :

	Rs.		Rs.
To Opening Stock	60,000	By Sales	4,00,000
To Purchase	2,75,000	By Closing Stock	75,000
To Wages	25,000		
To Gross Profit c/d	1,15,000		
	4,75,000		4,75,000
To Administrative Expenses	45,000	By Gross Profit b/d	1,15,000
To Selling and Distribution Expenses	10,000	By Interest on Investment	10,000
To Office Expenses	5,000		
To Non Operating Expenses	15,000		
To Net Profit	50,000		
	1,25,000		1,25,000

You are required to calculate :

- (1) Gross Profit Ratio.
- (2) Operating Ratio.
- (3) Operating Profit Ratio.
- (4) Net Profit Ratio.

Solution:

(1) <i>Gross Profit Ratio</i>	=	$\frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$
	=	$\frac{1,15,000}{4,00,000} \times 100$
	=	28.75 %
(2) <i>Operating Ratio</i>	=	$\frac{\text{Total Operating Cost}}{\text{Net Sales}} \times 100$
Total Operating Cost	=	Cost of Goods Sold + Operating Expenses
Cost of goods sold	=	Opening Stock + Purchases – Closing Stock
	=	Rs. 60,000 + 2,75,000 – 75,000
	=	Rs. 2,60,000
Operating Expenses	=	Office Expenses + Administrative Expenses + Selling and Distribution Expenses
	=	Rs. 5000 + 45,000 + 10,000
	=	Rs. 60,000
Total Operating Cost	=	Rs. 2,60,000 + 60,000
	=	Rs. 3,20,000
Operating Ratio	=	$\frac{3,20,000}{4,00,000} \times 100$
	=	80%
(3) <i>Operating Profit Ratio</i>	=	$\frac{\text{Net Operating Profit}}{\text{Net Sales}} \times 100$
Net Operating Profit	=	Net Sales – Total Operating Cost
	=	Rs. 4,00,000 – 3,20,000
	=	Rs. 80,000
Operating Profit Ratio	=	$\frac{80,000}{4,00,000} \times 100$
	=	20%
(4) <i>Net Profit Ratio</i>	=	$\frac{\text{Net Profit (after tax)}}{\text{Net Sales}} \times 100$
	=	$\frac{50,000}{4,00,000} \times 100$
	=	12.5 %

Answers

(1) Gross Profit Ratio	=	28.75%
(2) Operating Ratio	=	80%
(3) Operating Profit Ratio	=	20%
(4) Net Profit Ratio	=	12.5 %

Illustration: 12

The following are the summarized profit and loss account of Sun India Ltd. for the year ending 31st Dec. 2003 and the Balance sheet as on that date:

Dr.		Profit and Loss Account			Cr.
Particulars	Rs.	Particulars	Rs.	Rs.	
To Opening Stock	10,000	By Sales	1,20,000		
To Purchases	60,000	Less : Sales Return	10,000	1,10,000	
To Freight Expenses	5,000	By Closing Stock		15,000	
To Gross Profit c/d	50,000			1,25,000	
	1,25,000			1,25,000	
<i>To Operating Expenses :</i>		By Gross Profit b/d		50,000	
Office Expenses	5,000	By Non-Trading Income :			
Administrative Expenses	15,000	Interest on Investment		5,000	
Selling and Distribution Expenses	5,000	Profit on sale of fixed Assets		1,000	
<i>To Non-Operating Expenses:</i>		Dividend Received		4,000	
Loss on Sale of Fixed Assets	1,000				
To Net Profit	34,000			60,000	
	60,000			60,000	

Balance Sheet for the year ending 31st Dec. 2001

Liabilities	Rs.	Assets	Rs.
Share Capital	15,000	Cash in Hand	2,000
Reserves	3,000	Cash at Bank	3,000
Debenture	12,000	Marketable Securities	5,000
Current Liabilities	20,000	Inventories	15,000
Profit and Loss A/c	5,000	Sundry Debtors	6,000
		Prepaid Expense	4,000
		Land and Building	20,000
	55,000		55,000

You are required to calculate :

- (a) Current Ratio
- (b) Liquid Ratio
- (c) Gross Profit Ratio
- (d) Operating Ratio
- (e) Operating Profit Ratio
- (f) Net Profit Ratio

Solution:

	=	<u>Current Assets</u>	
(a) <i>Current Ratio</i>	=	Current Liabilities	
Current Assets	=	Rs. 2,000 + 3,000 + 5,000 + 15,000 + 6,000 + 4,000	
	=	Rs. 35,000	
Current Ratio	=	<u>35,000</u>	
	=	20,000	
	=	1.75 (or) 1.75 :1	
	=	<u>Liquid Assets</u>	
(b) <i>Liquid Ratio</i>	=	Current Liabilities	
Liquid Assets	=	Current Assets – (Stock and Prepaid Expenses)	
	=	Rs. 35,000 – (15,000 + 4,000)	
	=	Rs. 16,000	
Liquid Ratio	=	<u>16,000</u>	
	=	20,000	
	=	0.8 (or) 0.8:1	
	=	<u>Gross Profit</u>	x 100
(c) <i>Gross Profit Ratio</i>	=	Net Sales	
	=	<u>50,000</u>	x 100
	=	1,10,000	
	=	45.45 %	
	=	<u>Total Operating Cost</u>	x 100
(d) <i>Operating Ratio</i>	=	Net Sales	
Total Operating Cost	=	Cost of Goods Sold + Operating Expenses	
Cost of Goods Sold	=	Opening Stock + Purchases – Closing Stock	
	=	Rs. 10,000 + 60,000 – 15,000	
	=	Rs. 55,000	
Operating Expenses	=	Office Expenses + Administrative Expenses + Selling and Distribution Expenses	
	=	Rs. 5,000 + 15,000 + 5,000	
	=	Rs. 25,000	
Total operating cost	=	Rs. 55,000 + 25,000 = Rs. 80,000	
Operating Ratio	=	<u>80,000</u>	x 100 = 72.72%
	=	1,10,000	
	=	<u>Net Operating Profit</u>	x 100
(e) <i>Operating Profit Ratio</i>	=	Net Sales	
Net Operating Profit	=	Net Sales – Total Operating Cost	
	=	Rs. 1,10,000 – 80,000 = Rs. 30,000	
Operating Profit Ratio	=	<u>30,000</u>	x 100 = 27.27%
	=	1,10,000	

Alternatively

$$\begin{aligned}
 \text{Net Operating Profit} &= \text{Net Profit} + \text{Non-Operating Expenses} \\
 &\quad - \text{Non-Operating Income} \\
 \text{Net Operating Profit} &= \text{Rs. } 34,000 + 1,000 - (5,000 + 1,000 + 4,000) \\
 &= \text{Rs. } 35,000 - 10,000 = \text{Rs. } 25,000 \\
 \text{Operating Profit Ratio} &= \frac{25,000}{1,10,000} \times 100 \\
 &= 22.72\% \\
 (f) \text{ Net Profit Ratio} &= \frac{\text{Net Profit (after tax)}}{\text{Net Sales}} \times 100 \\
 &= \frac{34,000}{1,10,000} \times 100 \\
 &= 30.90\%
 \end{aligned}$$

Answers

$$\begin{aligned}
 (a) \text{ Current Ratio} &= 1.75 \text{ (or) } 1.75 : 1 \\
 (b) \text{ Liquid Ratio} &= 0.8 \text{ (or) } 0.8 : 1 \\
 (c) \text{ Gross Profit Ratio} &= 45.45\% \\
 (d) \text{ Operating Ratio} &= 72.72\% \\
 (e) \text{ Operating Profit Ratio} &= 27.27\% \text{ or } 22.72\% \\
 (f) \text{ Net Profit Ratio} &= 30.90\%
 \end{aligned}$$

(5) Return on Investment Ratio

This ratio is also called as ROI. This ratio measures a return on the owner's or shareholders' investment. This ratio establishes the relationship between net profit after interest and taxes and the owner's investment. Usually this is calculated in percentage. This ratio, thus, can be calculated as :

$$\begin{aligned}
 \text{Return on Investment Ratio} &= \frac{\text{Net Profit (after interest and tax)}}{\text{Shareholders' Fund (or) Investments}} \times 100 \\
 \text{Shareholder's Investments} &= \text{Equity Share Capital} + \text{Preference} \\
 &\quad \text{Share Capital} + \text{Reserves and Surplus} \\
 &\quad - \text{Accumulated Losses} \\
 \text{Net Profit} &= \text{Net Profit} - \text{Interest and Taxes}
 \end{aligned}$$

Advantages

- (1) This ratio highlights the success of the business from the owner's point of view.
- (2) It helps to measure an income on the shareholders' or proprietor's investments.
- (3) This ratio helps to the management for important decisions making.
- (4) It facilitates in determining efficiently handling of owner's investment.

Illustration: 13

Calculate Return on Investment Ratio from the following information :

	Rs.
1000 Equity shares @ of Rs.10 each	10,000
2000, 5% preference share @ of Rs. 10 each	20,000
Reverses	5,000
Net profit before interest and Tax	10,000
Interest	2,000
Taxes	3,000

Solution:

$$\begin{aligned}
 \text{Return on Investment Ratio} &= \frac{\text{Net Profit after Interest and Tax}}{\text{Shareholders' Investment}} \times 100 \\
 \text{Shareholders' Investment} &= \text{Equity Share Capital + Preference Share Capital + Reserves and Surplus} \\
 &\quad - \text{Accumulated Losses} \\
 \text{Shareholders' Investment} &= \text{Rs.10,000+ 20,000 + 5,000 – Nil} \\
 &= \text{Rs. 35,000} \\
 \text{Net Profit after Interest and Taxes} &= \text{Rs. 10,000 – (2,000 + 3,000)} \\
 &= \text{Rs.10,000 – 5,000 = 5,000} \\
 \text{Return on Investment Ratio} &= \frac{5,000}{35,000} \times 100 \\
 &= 14.28 \%
 \end{aligned}$$

(6) Return on Capital Employed Ratio

Return on Capital Employed Ratio measures a relationship between profit and capital employed. This ratio is also called as Return on Investment Ratio. The term return means Profits or Net Profits. The term Capital Employed refers to total investments made in the business. The concept of capital employed can be considered further into the following ways :

$$\begin{aligned}
 & \text{(a) Gross Capital Employed} \\
 & \text{(b) Net Capital Employed} \\
 & \text{(c) Average Capital Employed} \\
 & \text{(d) Proprietor's Net Capital Employed} \\
 \text{(a) Gross Capital Employed} &= \text{Fixed Assets + Current Assets} \\
 \text{(b) Net Capital Employed} &= \text{Total Assets – Current Liabilities} \\
 & \quad \text{Opening Capital Employed + Closing} \\
 & \quad \text{Capital Employed} \\
 \text{(c) Average Capital Employed} &= \frac{\quad}{2} \\
 & \quad \text{(or)} \\
 \text{Average Capital Employed} &= \text{Net Capital Employed + } \frac{1}{2} \text{ of Profit After Tax} \\
 \text{(d) Proprietor's Net Capital Employed} &= \text{Fixed Assets + Current Assets} \\
 & \quad - \text{Outside Liabilities} \\
 & \quad \text{(both long-term and short-term)}
 \end{aligned}$$

In order to compute this ratio, the below presented formulas are used:

$$(1) \text{ Return on Capital Employed} = \frac{\text{Net Profit After Taxes}}{\text{Gross Capital Employed}} \times 100$$

(or)

$$(2) \text{ Return on Capital Employed} = \frac{\text{Net Profit After Taxes Before Interest}}{\text{Gross Capital Employed}} \times 100$$

(or)

$$(3) \text{ Return on Capital Employed} = \frac{\text{Net Profit After Taxes Before Interest}}{\text{Average Capital Employed or Net Capital Employed}} \times 100$$

Illustration: 14

The following is the Balance sheet of M/s Sharma Ltd. for the year ending Dec. 31st 2003.

<i>Liabilities</i>	<i>Rs.</i>	<i>Assets</i>	<i>Rs.</i>
Equity Share Capital	4,00,000	Good Will	1,50,000
Reserves	40,000	Building	2,00,000
Profit and Loss A/c	80,000	Machinery	2,50,000
Debenture	1,00,000	Stock	80,000
Secured Loans	1,00,000	Sundry Debtors	60,000
Creditors	80,000	Bills Receivable	40,000
Provision for Tax	50,000	Cash at Bank	50,000
Bills Payable	40,000	Preliminary Expenses	60,000
	8,90,000		8,90,000

You are required to calculate :

- (a) Current Ratio
- (b) Liquid Ratio
- (c) Gross Capital Employed
- (d) Net Capital Employed
- (e) Average Capital Employed
- (f) Return on Capital Employed Ratio

Solution:

$$(a) \text{ Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Current Assets} = \text{Stock} + \text{Sundry Debtors} + \text{Bills Receivable} + \text{Cash at Bank} + \text{Preliminary Expenses}$$

$$= \text{Rs. } 80,000 + 60,000 + 50,000 + 60,000$$

$$= \text{Rs. } 2,50,000$$

$$\text{Current Liabilities} = \text{Creditors} + \text{Provision for Tax} + \text{Bills Payable}$$

$$= \text{Rs. } 80,000 + 50,000 + 40,000$$

$$= \text{Rs. } 1,70,000$$

$$\text{Current Ratio} = \frac{2,50,000}{1,70,000} = 1.47 \text{ (or) } 1.47 : 1$$

(b) <i>Liquid Assets</i>	=	Liquid Assets – (Stock and Preliminary Expenses)
	=	Rs. 2,50,000 – (80,000 + 60,000)
	=	Rs. 1,10,000
		$\frac{1,10,000}{1,70,000} = 0.64$ (or) 0.64 :1
(c) <i>Gross Capital Employed</i>	=	Fixed Assets + Current Assets
Fixed Assets	=	Goodwill + Building + Machinery
	=	1,50,000 + 2,00,000 + 2,50,000
	=	Rs. 6,00,000
Current Assets	=	Rs. 2,50,000
Gross Capital Employed	=	Rs. 6,00,000 + 2,50,000
	=	Rs. 8,50,000
(d) <i>Net Capital Employed</i>	=	Total Assets – Current Liabilities
Total Assets	=	Rs. 8,50,000
Current Liabilities	=	Rs. 1,70,000
Net Capital Employed	=	Rs. 8,50,000 – 1,70,000
	=	Rs. 6,80,000
(e) <i>Average Capital Employed</i>	=	Net Capital Employed + $\frac{1}{2}$ of Profit After Tax
$\frac{1}{2}$ of profit after tax	=	$\frac{1}{2}$ (80,000 – 50,000)
	=	Rs. 15,000
Average Capital Employed	=	Rs. 7,20,000 + 15,000
	=	Rs. 7,35,000
(f) <i>Return on Capital Employed</i>	=	$\frac{\text{Net Profit After Tax}}{\text{Gross Capital Employed}} \times 100$
	=	$\frac{80,000 - 50,000}{8,50,000} \times 100$
	=	$\frac{30,000}{8,50,000} \times 100$
	=	3.52%

Alternatively

Return on Capital Employed	=	$\frac{\text{Net Profit After Tax}}{\text{Net Capital Employed}} \times 100$
	=	$\frac{30,000}{7,20,000} \times 100$
	=	4.16 %

Answers

(a) Current Ratio	=	1.47 (or) 1.47 :1
(b) Liquid Ratio	=	0.64 (or) 0.64 :1
(c) Gross Capital Employed	=	Rs. 8,50,000
(d) Net Capital Employed	=	Rs. 7,20,000
(e) Average Capital Employed	=	Rs. 7,35,000
(f) Return on Capital Employed	=	3.52 % (or) 4.16 %

(7) Earning Per Share Ratio

Earning Per Share Ratio (EPS) measures the earning capacity of the concern from the owner's point of view and it is helpful in determining the price of the equity share in the market place. Earning Per Share Ratio can be calculated as :

$$\text{Earning Per Share Ratio} = \frac{\text{Net Profit After Tax and Preference Dividend}}{\text{No. of Equity Shares}}$$

Advantages

- (1) This ratio helps to measure the price of stock in the market place.
- (2) This ratio highlights the capacity of the concern to pay dividend to its shareholders.
- (3) This ratio used as a yardstick to measure the overall performance of the concern.

Illustration: 15

Calculate the Earning Per Share from the following data :

Net Profit before tax Rs. 2,00,000.

Taxation at 50% of Net Profit.

10 % Preference share capital (Rs. 10 each) Rs. 2,00,000, Equity share capital (Rs. 10 each) Rs. 2,00,000.

Solution:

	=	<u>Net Profit After Tax and Preference Dividend</u>
Earning Per Equity Share	=	No. of Equity Shares
Net Profit before Tax	=	Rs. 2,00,000
Taxation at 50 % of Net Profit	=	2,00,000 x $\frac{50}{100}$
	=	Rs. 1,00,000
Net Profit after Tax	=	Rs. 2,00,000 – 1,00,000
	=	Rs. 1,00,000
10 % of Preference Dividend	=	2,00,000 x $\frac{10}{100}$
	=	Rs. 20,000
Net Profit after Tax and Preference Dividend	=	Rs. 1,00,000 – 20,000
	=	Rs. 80,000
No. of Equity Shares	=	<u>2,00,000</u>
	=	10
	=	20,000 Shares
Earning Per Equity Share	=	<u>80,000</u>
	=	20,000
	=	Rs. 4 Per Share

(8) Dividend Payout Ratio

This ratio highlights the relationship between payment of dividend on equity share capital and the profits available after meeting tax and preference dividend. This ratio indicates the dividend policy adopted by the top management about utilization of divisible profit to pay dividend or to retain or both. The ratio, thus, can be calculated as :

$$\begin{aligned} \text{Dividend Payout Ratio} &= \frac{\text{Equity Dividend}}{\text{Net Profit After Tax and Preference Dividend}} \times 100 \\ & \text{(or)} \\ &= \frac{\text{Dividend Per Equity Share}}{\text{Earning Per Equity Share}} \times 100 \end{aligned}$$

Illustration: 16

Compute Dividend Payout Ratio from the following data :

Net Profit	Rs. 60,000
Provision for tax	Rs. 15,000
Preference dividend	Rs. 15,000
No. of Equity Shares	Rs. 6,000
Dividend Per Equity Share = 0.30	

Solution :

$$\begin{aligned} \text{Dividend Payout Ratio} &= \frac{\text{Equity Dividend}}{\text{Net Profit After Tax and Preference Dividend}} \times 100 \\ \text{Equity Dividend} &= \text{No. of Equity Shares} \times \text{Dividend Per Equity Share} \\ &= 6,000 \times 0.30 \\ &= \text{Rs. 1,800} \\ \text{Net Profit After Tax} &= \text{Rs. 60,000} - (15,000 + 15,000) \\ \text{Preference Dividend} &= \text{Rs. 60,000} - 30,000 \\ &= \text{Rs. 30,000} \end{aligned}$$

Alternatively

$$\begin{aligned} \text{Dividend Payout Ratio} &= \frac{\text{Dividend Per Equity Share}}{\text{Earning Per Equity Share}} \times 100 \\ \text{Dividend Per Equity Share} &= 0.30 \\ \text{Earning Per Equity Share} &= \frac{\text{Net Profit After tax and Preference Dividend}}{\text{No. of Equity Shares}} \\ &= \frac{30,000}{6,000} = \text{Rs. 5 Per Share} \\ \text{Dividend Payout Ratio} &= \frac{0.30}{5} \times 100 \\ &= 6\% \end{aligned}$$

(9) Dividend Yield Ratio:

Dividend Yield Ratio indicates the relationship is established between dividend per share and market value per share. This ratio is a major factor that determines the dividend income from the investors' point of view. It can be calculated by the following formula :

$$\text{Dividend Yield Ratio} = \frac{\text{Dividend Per Share}}{\text{Market Value Per Share}} \times 100$$

Illustration: 17

The following details have been given to you for M/s I.M. Pandey Ltd., you are required to find out (1) Dividend Yield Ratio (2) Dividend Payout Ratio and (3) Earning Per Share Ratio.

10 % Preference Shares of Rs. 10 each	Rs.	5,00,000
60,000 Equity Shares of Rs. 10 each	Rs.	6,00,000
	Rs.	11,00,000

Additional Information	
Profit after tax at	50 %
Equity Dividend Paid	20 %
Market Price of Equity Share Rs. 30	

Solution:

Profit after Tax	=	Rs. 1,50,000
Less : Preference dividend (10% of 5,00,000)	=	50,000
Equity Earnings	=	<u>1,00,000</u>

Profit after tax and preference dividend	=	Rs. 1,00,000
No. of Equity Shares	=	60,000 Shares
(1) <i>Dividend Yield Ratio</i>	=	$\frac{\text{Dividend Per Share}}{\text{Market Value Per Share}} \times 100$
	=	$\frac{20 \% \text{ of Rs. } 10}{\text{Rs. } 30} \times 100$
	=	$\frac{2}{30} \times 100 = 6.66\%$
(2) <i>Earning Per Equity Share</i>	=	$\frac{\text{Net Profit after tax preference dividend}}{\text{No. of Equity Shares}} \times 100$
	=	$\frac{1,00,000}{60,000} = \text{Rs. } 1.67 \text{ Per Share}$
(3) <i>Dividend Payout Ratio</i>	=	$\frac{\text{Dividend Per Equity Share}}{\text{Earning Per Equity Share}} \times 100$
	=	$\frac{2}{1.67} \times 100$
	=	119.76%

Alternatively

$$\begin{aligned}
 \text{Dividend Payout Ratio} &= \frac{\text{Equity Dividend}}{\text{Net Profit After Tax and Preference Dividend}} \times 100 \\
 \text{Equity Dividend} &= 20\% \text{ of Rs. } 10 = \text{Rs. } 2 \\
 \therefore \text{Equity Dividend for 60,000 Shares} &= 60,000 \times 2 = \text{Rs. } 1,20,000 \\
 \text{Dividend Payout Ratio} &= \frac{1,20,000}{1,00,000} \times 100 \\
 &= 120\%
 \end{aligned}$$

Illustration: 18

Compute: (1) Earning Per Share (2) Dividend Yield Ratio from the following information :

Net Profit	= Rs. 3,00,000
Market Price Per Equity Share	= Rs. 40
No. of Equity Shares	= 30,000
Provision for Tax	= Rs. 50,000
Preference Dividend	= Rs. 30,000

Solution:

$$\begin{aligned}
 (1) \text{ Earning Per Share} &= \frac{\text{Net Profit After Tax and Preference Dividend}}{\text{No. of Equity Shares}} \times 100 \\
 \left. \begin{array}{l} \text{Net Profit After Tax and} \\ \text{Preference Dividend} \end{array} \right\} &= \text{Rs. } 3,00,000 - (50,000 + 30,000) \\
 &= \text{Rs. } 3,00,000 - 80,000 = \text{Rs. } 2,20,000 \\
 (2) \text{ Earning Per Share} &= \frac{2,20,000}{30,000} \\
 &= \text{Rs. } 7.33 \\
 \text{Dividend Yield Ratio} &= \frac{\text{Earning Per Share}}{\text{Market Value Per Share}} \times 100 \\
 &= \frac{7.33}{40} \times 100 \\
 &= 18.33\%
 \end{aligned}$$

(10) Price Earning Ratio

This ratio highlights the earning per share reflected by market share. Price Earning Ratio establishes the relationship between the market price of an equity share and the earning per equity share. This ratio helps to find out whether the equity shares of a company are undervalued or not. This ratio is also useful in financial forecasting. This ratio is calculated as :

$$\text{Price Earning Ratio} = \frac{\text{Market Price Per Equity Share}}{\text{Earning Per Share}}$$

Illustration: 19

Calculate (1) Earning Per Share (2) Dividend Yield Ratio and (3) Price Earning Ratio from the following figures:

Net Profit	=	Rs. 6,00,000
Market price Per Equity Shares	=	Rs. 60
No. of Equity Shares	=	40,000
Provision for Tax	=	Rs. 1,60,000
Preference Dividend	=	Rs. 50,000
Depreciation	=	Rs. 70,000
Bank Overdraft	=	Rs. 50,000

Solution:

$$\begin{aligned}
 (1) \text{ Earning Per Share} &= \frac{\text{Net Profit After Tax and Preference Dividend}}{\text{No. of Equity Shares}} \\
 \text{Net Profit After Tax and Preference Dividend} &= \text{Rs. 6,00,000} - (1,60,000 + 50,000) \\
 &= \text{Rs. 6,00,000} - 2,10,000 = \text{Rs. 3,90,000} \\
 \text{Earning Per Share} &= \frac{3,90,000}{40,000} \\
 &= \text{Rs. 9.75} \\
 (2) \text{ Dividend Yield Ratio} &= \frac{\text{Earning Per Share}}{\text{Market Value Per Share}} \times 100 \\
 &= \frac{9.75}{60} \times 100 \\
 &= 16.25\% \\
 (3) \text{ Price Earning Ratio} &= \frac{\text{Market Price Per Equity Share}}{\text{Earning Per Share}} \\
 &= \frac{60}{9.75} \\
 &= 6.15
 \end{aligned}$$

Interpretations: The market price of a share is Rs. 60 and earning per share is Rs. 9.75, the price earning ratio would be 6.15. It means that the market value of every one rupee of earning is 6.15 times or Rs. 6.15.

(11) Net Profit to Net Worth Ratio

This ratio measures the profit return on investment. This ratio indicates the established relationship between net profit and shareholders' net worth. It is a reward for the assumption of ownership risk. This ratio is calculated as :

$$\begin{aligned}
 \text{Net Profit to Net Worth} &= \frac{\text{Net Profit After Taxes}}{\text{Shareholders' Net Worth}} \times 100 \\
 \text{Shareholder Net Worth} &= \text{Total Tangible Net Worth} \\
 \text{Total Tangible Net Worth} &= \text{Company's Net Assets} - \text{Long-Term Liabilities} \\
 & \text{(or)} \\
 &= \text{Shareholders' Funds} + \text{Profits Retained in business}
 \end{aligned}$$

Advantages

- (1) This ratio determines the incentive to owners.
- (2) This ratio helps to measure the profit as well as net worth.
- (3) This ratio indicates the overall performance and effectiveness of the firm.
- (4) This ratio measures the efficiency with which the resources of a firm have been employed.

Illustration: 20

Compute Net Profit to Net Worth Ratio from the following data :

	Rs.
Net Profit	80,000
Provision for Tax	15,000
Shareholders' Fund	8,00,000
Dividend to Equity Shares	20,000
Dividend to Preference Shares @ 10 %	10,000

Solution:

Net Profit to Net Worth	=	$\frac{\text{Net Profit After Taxes}}{\text{Total Tangible Net Worth}} \times 100$
Net Profit after Taxes	=	Rs. 80,000 – 15,000 = Rs.65, 000
Total Tangible Net Worth	=	Shareholders' fund + Profit retained in business
Profit Retained in Business	=	Profit – (Taxes + Preference dividend + Equity dividend)
	=	Rs. 80,000 – (15,000 + 20,000 + 10,000)
	=	Rs. 80,000 – 45,000
	=	Rs. 35,000
Total Tangible Net Worth	=	Rs. 8,00,000 + 35,000
	=	Rs. 9,15,000
Net Profit Net Worth	=	$\frac{65,000}{9,15,000} \times 100 = 7.10\%$
Net Profit to Net Worth Ratio	=	7.10 %

III. TURNOVER RATIOS

Turnover Ratios may be also termed as Efficiency Ratios or Performance Ratios or Activity Ratios. Turnover Ratios highlight the different aspect of financial statement to satisfy the requirements of different parties interested in the business. It also indicates the effectiveness with which different assets are vitalized in a business. Turnover means the number of times assets are converted or turned over into sales. The activity ratios indicate the rate at which different assets are turned over.

Depending upon the purpose, the following activities or turnover ratios can be calculated :

1. Inventory Ratio or Stock Turnover Ratio (Stock Velocity)
2. Debtor's Turnover Ratio or Receivable Turnover Ratio (Debtor's Velocity)
- 2 A. Debtor's Collection Period Ratio
3. Creditor's Turnover Ratio or Payable Turnover Ratio (Creditor's Velocity)
- 3 A. Debt Payment Period Ratio

4. Working Capital Turnover Ratio
5. Fixed Assets Turnover Ratio
6. Capital Turnover Ratio.

(1) Stock Turnover Ratio

This ratio is also called as Inventory Ratio or Stock Velocity Ratio.

Inventory means stock of raw materials, working in progress and finished goods. This ratio is used to measure whether the investment in stock in trade is effectively utilized or not. It reveals the relationship between sales and cost of goods sold or average inventory at cost price or average inventory at selling price. Stock Turnover Ratio indicates the number of times the stock has been turned over in business during a particular period. While using this ratio, care must be taken regarding season and condition, price trend, supply condition etc. In order to compute this ratio, the following formulae are used :

$$\begin{aligned}
 (1) \text{ Stock Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory at Cost}} \\
 \text{Cost of Goods Sold} &= \text{Opening Stock} + \text{Purchases} + \text{Direct Expenses} - \text{Closing Stock} \\
 &(\text{or}) \\
 &= \text{Total Cost of Production} + \text{Opening Stock of Finished Goods} - \text{Closing Stock of Finished Goods} \\
 \text{Total Cost of Production} &= \text{Cost of Raw Material Consumed} + \text{Wages} + \text{Factory Cost} \\
 &(\text{or}) \\
 &= \text{Sales} - \text{Gross Profit} \\
 \text{Average Stock} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\
 (2) \text{ Stock Turnover Ratio} &= \frac{\text{Net Sales}}{\text{Average Inventory at Cost}} \\
 (3) \text{ Stock Turnover Ratio} &= \frac{\text{Net Sales}}{\text{Average Inventory at Selling Price}} \\
 (4) \text{ Stock Turnover Ratio} &= \frac{\text{Net Sales}}{\text{Inventory}}
 \end{aligned}$$

The above said formulas can be used on the basis of the information given in the illustration.

Advantages

- (1) This ratio indicates whether investment in stock in trade is efficiently used or not.
- (2) This ratio is widely used as a measure of investment in stock is within proper limit or not.
- (3) This ratio highlights the operational efficiency of the business concern.
- (4) This ratio is helpful in evaluating the stock utilization.

- (5) It measures the relationship between the sales and the stock in trade.
- (6) This ratio indicates the number of times the inventories have been turned over in business during a particular period.

Illustration: 21

From the following information calculate stock turnover ratio :

Gross Sales	:	Rs.	5,00,000
Sales Return	:	Rs.	25,000
Opening Stock	:	Rs.	70,000
Closing Stock at Cost	:	Rs.	85,000
Purchase	:	Rs.	3,00,000
Direct Expenses	:	Rs.	1,00,000

Solution:

$$\begin{aligned}
 \text{Inventory Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory at Cost}} \\
 \text{Cost of Goods Sold} &= \text{Opening Stock} + \text{Purchases} + \text{Direct Expenses} \\
 &\quad - \text{Closing Stock} \\
 &= \text{Rs. } 70,000 + 3,00,000 + 1,00,000 - 85,000 \\
 &= \text{Rs. } 3,85,000 \\
 \text{Average Stock} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\
 &= \frac{70,000 + 85,000}{2} = \text{Rs. } 77,500 \\
 \text{Inventory Turnover Ratio} &= \frac{3,85,000}{77,500} = 4.97 \text{ times}
 \end{aligned}$$

Illustration: 22

The following figures are extract from the Trading Account of X A/c, you are required to calculate stock Turnover Ratio :

Opening Stock	Rs.	30,000
Purchases	Rs.	1,10,000
Direct Expenses	Rs.	10,000
Gross Profit	Rs.	75,000
Gross Sales	Rs.	2,20,000
Sales Return	Rs.	10,000
Closing Stock at Cost	Rs.	15,000

Solution:

$$\begin{aligned}
 \text{Stock Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory at Cost}} \\
 \text{Cost of Goods Sold} &= \text{Opening Stock} + \text{Purchases} \\
 &\quad + \text{Direct Expenses} - \text{Closing Stock} \\
 &= \text{Rs. } 30,000 + 1,10,000 + 10,000 - 15,000 \\
 &= \text{Rs. } 1,35,000
 \end{aligned}$$

Alternatively

$$\begin{aligned}
 \text{Cost of Goods Sold} &= \text{Sales} - \text{Gross Profit} \\
 \text{Net Sales} &= \text{Sales} - \text{Sales Return} \\
 &= \text{Rs. } 2,20,000 - 10,000 = \text{Rs. } 2,10,000 \\
 \text{Cost of Goods Sold} &= \text{Rs. } 2,10,000 - 75,000 = \text{Rs. } 1,35,000 \\
 \text{Average Inventory} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\
 &= \frac{30,000 + 15,000}{2} = \frac{45,000}{2} \\
 &= \text{Rs. } 22,500 \\
 \text{Stock Turnover Ratio} &= \frac{1,35,000}{22,500} = 6 \text{ times}
 \end{aligned}$$

Alternatively

$$\begin{aligned}
 \text{Stock Turnover Ratio} &= \frac{\text{Net Sales}}{\text{Average Inventory at Cost}} \\
 &= \frac{2,10,000}{22,500} \\
 &= 9.33 \text{ times}
 \end{aligned}$$

(2) Debtor's Turnover Ratio

Debtor's Turnover Ratio is also termed as Receivable Turnover Ratio or Debtor's Velocity. Receivables and Debtors represent the uncollected portion of credit sales. Debtor's Velocity indicates the number of times the receivables are turned over in business during a particular period. In other words, it represents how quickly the debtors are converted into cash. It is used to measure the liquidity position of a concern. This ratio establishes the relationship between receivables and sales. Two kinds of ratios can be used to judge a firm's liquidity position on the basis of efficiency of credit collection and credit policy. They are (A) Debtor's Turnover Ratio and (B) Debt Collection Period. These ratios may be computed as :

$$\begin{aligned}
 (1) \text{ Debtor's Turnover Ratio} &= \frac{\text{Net Credit Sales}}{\text{Average Receivables}} \\
 &\quad \text{or} \\
 &\quad \text{Average Accounts Receivable} \\
 \text{Net Credit Sales} &= \text{Total Sales} - (\text{Cash Sales} + \text{Sales Return}) \\
 \text{Accounts Receivable} &= \text{Sundry Debtors or Trade Debtors} \\
 &\quad + \text{Bills Receivable} \\
 \text{Average Accounts Receivable} &= \frac{\text{Opening Receivable} + \text{Closing Receivable}}{2}
 \end{aligned}$$

It is to be noted that opening and closing receivable and credit sales are not available, the ratio may be calculated as

$$\text{Debtor's Turnover Ratio} = \frac{\text{Total Sales}}{\text{Accounts Receivable}}$$

Illustration: 23

Calculate Debtor's Turnover Ratio, from the following data :

		Rs.
Sundry Debtors as on	1.1.2003	70,000
Sundry Debtors as on	31.12.2003	90,000
Bills Receivable as on	1.1.2003	20,000
Bills Receivable as on	31.12.2003	30,000
Total Sales for the year 2003		7,00,000
Sales Return		20,000
Cash sales for the year 2003		1,00,000

Solution:

$$\begin{aligned}
 \text{Debtor's Turnover Ratio} &= \frac{\text{Net Credit Sales}}{\text{Average Account Receivable}} \\
 \text{Net Credit Sales} &= \text{Total Sales} - (\text{Cash Sales} + \text{Sales Return}) \\
 &= \text{Rs. } 7,00,000 - (1,00,000 + 20,000) \\
 &= \text{Rs. } 5,80,000 \\
 \text{Average Accounts Receivable} &= \frac{\text{Opening Receivable} + \text{Closing Receivable}}{2} \\
 &= \frac{(70,000 + 20,000) + (90,000 + 30,000)}{2} \\
 &= \frac{90,000 + 1,20,000}{2} = \frac{2,10,000}{2} \\
 &= \text{Rs. } 1,05,000 \\
 \text{Debtors Turnover Ratio} &= \frac{5,80,000}{1,05,000} \\
 &= 5.52 \text{ times}
 \end{aligned}$$

2 (A) Debt Collection Period Ratio

This ratio indicates the efficiency of the debt collection period and the extent to which the debt have been converted into cash. This ratio is complementary to the Debtor Turnover Ratio. It is very helpful to the management because it represents the average debt collection period. The ratio can be calculated as follows:

$$\begin{aligned}
 \text{(a) Debt Collection Period Ratio} &= \frac{\text{Months (or) Days in a year}}{\text{Debtor's Turnover}} \\
 &\quad \text{(or)} \\
 &\quad \frac{\text{Average Accounts Receivable} \times \text{Months (or) Days in a year}}{\text{Net Credit Sales for the year}} \\
 \text{(b) Debt Collection Period Ratio} &= \frac{\text{Average Accounts Receivable} \times \text{Months (or) Days in a year}}{\text{Net Credit Sales for the year}}
 \end{aligned}$$

Advantages of Debtor's Turnover Ratio

- (1) This ratio indicates the efficiency of firm's credit collection and efficiency of credit policy.
- (2) This ratio measures the quality of receivable, i.e., debtors.

- (3) It enables a firm to judge the adequacy of the liquidity position of a concern.
- (4) This ratio highlights the probability of bad debts lurking in the trade debtors.
- (5) This ratio measures the number of times the receivables are turned over in business during a particular period.
- (6) It points out the liquidity of trade debtors, i.e., higher turnover ratio and shorter debt collection period indicate prompt payment by debtors. Similarly, low turnover ratio and higher collection period implies that payment by trade debtors are delayed :

Illustration: 24

From the following information calculate:

<p>(a) <i>Debtor's Turnover Ratio and</i></p> <p>Total Sales</p> <p>Cash Sales</p> <p>Sales Return</p> <p>Opening Accounts Receivable</p> <p>Closing Accounts Receivable</p>	<p>(b) <i>Debt Collection Period Ratio.</i></p> <p>Rs. 1,00,000</p> <p>Rs. 25,000</p> <p>Rs. 5,000</p> <p>Rs. 10,000</p> <p>Rs. 15,000</p>
--	--

Solution:

$$\begin{aligned}
 \text{(a) Debtor's Turnover Ratio} &= \frac{\text{Net Credit Sales}}{\text{Average Receivables}} \\
 \text{Net Credit Sales} &= \text{Total Sales} - (\text{Cash Sales} + \text{Sales Return}) \\
 &= \text{Rs. } 1,00,000 - (25,000 + 5,000) \\
 &= \text{Rs. } 70,000 \\
 \text{Average Receivables} &= \frac{\text{Opening Receivables} + \text{Closing Receivables}}{2} \\
 &= \frac{10,000 + 15,000}{2} = \frac{25,000}{2} = \text{Rs. } 12,500 \\
 \text{Debtor's Turnover Ratio} &= \frac{70,000}{12,500} = 5.6 \text{ times} \\
 \text{(b) Debt Collection Period Ratio} &= \frac{\text{Month (or) Days in a year}}{\text{Debtor's Turnover}} \\
 &= \frac{12}{5.6} \\
 &= 2.14 \text{ months}
 \end{aligned}$$

Alternatively

$$\begin{aligned}
 \text{Debt Collection Period Ratio} &= \frac{\text{Average Accounts Receivable} \times \text{Months in a year}}{\text{Net Credit Sales for the year}} \\
 &= \frac{12,500 \times 12}{70,000} \\
 &= 2.14 \text{ months}
 \end{aligned}$$

Illustration: 25

From the following profit and loss Account and balance sheet relating to Ramesh Company presented as on 31st March, 2003 :

Dr.		Profit and Loss Account		Cr.	
<i>Particulars</i>	<i>Rs.</i>	<i>Particulars</i>	<i>Rs.</i>	<i>Rs.</i>	
To Opening Stock	3,000	By Gross Sales	Rs. 2,00,000		
To Purchase	1,20,000	Less: Sales Return	Rs. 5,000	1,95,000	
To Wages (Direct)	7,000	By Closing Stock		5,000	
To Gross Profit c/d	70,000				
	2,00,000			2,00,000	
To Administrative Expn.	15,000	By Gross Profit b/d		70,000	
To Selling and Distribution expenses }	20,000	By Dividend Received		10,000	
To Loss on sale of Fixed Assets }	5,000				
To Net Profit	40,000				
	80,000			80,000	

Balance Sheet as on 31st March 2002

<i>Liabilities</i>	<i>Rs.</i>	<i>Assets</i>	<i>Rs.</i>
Equity Share Capital (5000 Equity Shares of 100 each)	5,00,000	Land	1,50,000
General Reserve	50,000	Building	2,00,000
Profit and Loss A/c	70,000	Plant & Machinery	2,00,000
Sundry Creditors	80,000	Stock	80,000
		Debtors	50,000
		Bank Balance	20,000
	7,00,000		7,00,000

From the above information you are required to calculate :

- (1) Gross Profit Ratio.
- (2) Operating Ratio.
- (3) Operating Profit Ratio.
- (4) Net Profit to Capital Employed Ratio.
- (5) Current Ratio.
- (6) Liquid Ratio.
- (7) Stock Turnover Ratio.
- (8) Debtor's Turnover Ratio.
- (9) Debt Collection Period Ratio.

Solution:

$$\begin{aligned}
 (1) \text{ Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100 \\
 &= \frac{70,000}{1,95,000} \times 100 \\
 &= 35.89\%
 \end{aligned}$$

(2) <i>Operating Ratio</i>	=	$\frac{\text{Operating Cost}}{\text{Net Sales}} \times 100$
Operating Cost	=	Cost of goods sold + Administrative Expenses + Selling and distribution Expenses
Cost of Goods Sold	=	Opening Stock + Purchases + Direct Wages – Closing Stock
	=	Rs. 3,000 + 1,20,000 + 7,000 – 5,000
	=	Rs. 1,30,000 – 5,000 = Rs.1,25,000
Operating Cost	=	Rs. 1,25,000 + 15,000 + 20,000
	=	Rs. 1,60,000
Operating Ratio	=	$\frac{1,60,000}{1,95,000} \times 100 = 82.05\%$
(3) <i>Operating Profit Ratio</i>	=	$\frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$
Operating Profit	=	Net Sales – Total Operating Cost
	=	Rs. 1,95,000 – 1,60,000 = Rs. 35,000
Operating Profit Ratio	=	$\frac{35,000}{1,95,000} \times 100$
	=	17.94%
(4) <i>Net Profit to Capital Employed Ratio</i>	=	$\frac{\text{Net Profit}}{\text{Capital Employed}} \times 100$
Capital Employed	=	Share Capital + General Reserve + Profit and Loss A/c
	=	Rs. 5,00,000 + 50,000 + 70,000
	=	Rs. 6,20,000
Net Profit to Capital Employed Ratio	=	$\frac{40,000}{6,20,000} \times 100$
	=	6.45 %
(5) <i>Current Ratio</i>	=	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$
Current Assets	=	Stock + Debtors + Bank Balances
	=	Rs. 80,000 + 50,000 + 20,000
	=	Rs. 1,50,000
Current Ratio	=	$\frac{1,50,000}{80,000} = 1.88 \text{ (or) } 1.88 : 1$
(6) <i>Liquid Ratio</i>	=	$\frac{\text{Liquid Assets}}{\text{Current Liabilities}}$
Liquid Assets	=	Current Assets – Stock and Prepaid Expenses
	=	Rs. 1,50,000 – 80,000
	=	Rs. 70,000
Liquid Ratio	=	$\frac{70,000}{80,000}$
	=	87.5 (or) 87.5 : 1

$$\begin{aligned}
 (7) \text{ Stock Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \\
 \text{Average Inventory} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\
 &= \frac{3,000 + 5,000}{2} \\
 &= \text{Rs. 4,000} \\
 \text{Stock Turnover Inventory} &= \frac{1,25,000}{4,000} \\
 &= 31.25 \text{ times}
 \end{aligned}$$

Alternatively

$$\begin{aligned}
 \text{Stock Turnover Ratio} &= \frac{\text{Net Sales}}{\text{Average Inventory}} \\
 &= \frac{1,95,000}{4,000} = 48.75 \text{ times} \\
 (8) \text{ Debtor's Turnover Ratio} &= \frac{\text{Net Credit Sales}}{\text{Average Receivables}}
 \end{aligned}$$

It is to be noted that credit sales, opening and closing receivables are not given in the problem, the ratio may be calculated as :

$$\begin{aligned}
 \text{Debtor's Turnover Ratio} &= \frac{\text{Total Sales}}{\text{Accounts Receivable}} \\
 &= \frac{1,95,000}{50,000} \\
 &= 3.9 \text{ times} \\
 (9) \text{ Debt Collection Period Ratio} &= \frac{\text{Month or Days in a year}}{\text{Debtor's Turnover}} \\
 &= \frac{365 \text{ days}}{3.9} = 93.58 \text{ days} \\
 &(\text{or}) \\
 &= \frac{12 \text{ months}}{3.9} \\
 &= 3.07 \text{ months}
 \end{aligned}$$

(3) Creditor's Turnover Ratio

Creditor's Turnover Ratio is also called as Payable Turnover Ratio or Creditor's Velocity. The credit purchases are recorded in the accounts of the buying companies as Creditors to Accounts Payable. The Term Accounts Payable or Trade Creditors include sundry creditors and bills payable. This ratio establishes the relationship between the net credit purchases and the average trade creditors. Creditor's velocity ratio indicates the number of times with which the payment is made to the supplier in respect of

credit purchases. Two kinds of ratios can be used for measuring the efficiency of payable of a business concern relating to credit purchases. They are: (1) Creditor's Turnover Ratio (2) Creditor's Payment Period or Average Payment Period. The ratios can be calculated by the following formulas :

$$\begin{aligned}
 (1) \text{ Creditor's Turnover Ratio} &= \frac{\text{Net Credit Purchases}}{\text{Average Accounts Payable}} \\
 \text{Net Credit Purchases} &= \text{Total Purchases} - \text{Cash Purchases} \\
 \text{Average Accounts Payable} &= \frac{\text{Opening Payable} + \text{Closing Payable}}{2} \\
 \\
 (2) \text{ Average Payment Period} &= \frac{\text{Month (or) Days in a year}}{\text{Creditors Turnover Ratio}} \\
 & \text{(or)} \\
 &= \frac{\text{Average Trade Creditors}}{\text{Net Credit Purchases}} \times 365
 \end{aligned}$$

Significance : A high Creditor's Turnover Ratio signifies that the creditors are being paid promptly. A lower ratio indicates that the payment of creditors are not paid in time. Also, high average payment period highlight the unusual delay in payment and it affect the creditworthiness of the firm. A low average payment period indicates enhancing the creditworthiness of the company.

Illustration: 26

From the following information calculate (1) Creditor's Turnover Ratio and (2) Average Payment Period

	Rs.
Total Purchase	3,00,000
Cash Purchases	1,75,000
Purchase Return	25,000
Sundry Creditors 1.1.2003	30,000
Sundry Creditors 31.12.2003	15,000
Bills Payable 1.1.2003	7,000
Bills Payable 31.12.2003	8,000

Solution:

$$\begin{aligned}
 (1) \text{ Creditor's Turnover Ratio} &= \frac{\text{Net Credit Purchases}}{\text{Average Accounts Payables}} \\
 \text{Net Credit Purchases} &= \text{Total Purchases} - (\text{Cash Purchases} + \text{Purchase Return}) \\
 &= \text{Rs. } 3,00,000 - (1,75,000 + 25,000) \\
 &= \text{Rs. } 1,00,000 \\
 \\
 \text{Average Accounts Payable} &= \frac{\text{Opening payable} + \text{Closing payable}}{2} \\
 &= \frac{(30,000 + 7,000) + (15,000 + 8000)}{2}
 \end{aligned}$$

$$\begin{aligned}
 &= \frac{60,000}{2} = \text{Rs. } 30,000 \\
 \text{Creditor's Turnover Ratio} &= \frac{1,00,000}{30,000} = 3.33 \text{ times} \\
 (2) \text{ Average Payment Period} &= \frac{\text{Month or Days in a year}}{\text{Creditor's Turnover Ratio}} \\
 &= \frac{12 \text{ months}}{3.33} = 3.60 \text{ months} \\
 &\quad (\text{or}) \\
 &= \frac{365 \text{ days}}{3.33} = 109.61 \text{ days}
 \end{aligned}$$

Alternatively

$$\begin{aligned}
 \text{Average Payment Period} &= \frac{\text{Average Trade Creditors}}{\text{Net Credit Purchases}} \times 365 \\
 &= \frac{30,000}{1,00,000} \times 365 \\
 &= 109.5 \text{ days}
 \end{aligned}$$

(4) Working Capital Turnover Ratio

This ratio highlights the effective utilization of working capital with regard to sales. This ratio represent the firm's liquidity position. It establishes relationship between cost of sales and networking capital. This ratio is calculated as follows :

$$\begin{aligned}
 \text{Working Capital Turnover Ratio} &= \frac{\text{Net Sales}}{\text{Working Capital}} \\
 \text{Net Sales} &= \text{Gross Sales} - \text{Sales Return} \\
 \text{Work Capital} &= \text{Current Assets} - \text{Current Liabilities}
 \end{aligned}$$

Significance : It is an index to know whether the working capital has been effectively utilized or not in making sales. A higher working capital turnover ratio indicates efficient utilization of working capital, i.e., a firm can repay its fixed liabilities out of its working capital. Also, a lower working capital turnover ratio shows that the firm has to face the shortage of working capital to meet its day-to-day business activities unsatisfactorily.

Illustration: 27

Calculate Working Capital Turnover Ratio :

Current Assets	Rs.	3,20,000
Current Liabilities	Rs.	1,10,000
Gross Sales	Rs.	4,00,000
Sales Return	Rs.	20,000

Solution:

	=	<u>Net Sales</u>
Working Capital Turnover Ratio	=	Working Capital
Net Sales	=	Gross Sales – Sales Return
Working Capital	=	Rs. 4,00,000 – 20,000
		Rs. 3,80,000
Working Capital	=	Current Assets – Current Liabilities
	=	Rs. 3,20,000 – 1,10,000
	=	Rs. 2,10,000
		<u>3,80,000</u>
Working Capital Turnover Ratio	=	2,10,000
	=	1.80 times

Illustration: 28

The following information is given about M/s Gowda Ltd. for the year ending Dec. 31st 2003 :

(a) Share Capital	Rs. 8,40,000
(b) Bank Overdraft	Rs. 50,000
(c) Working Capital	Rs. 2,52,000
(d) Current Ratio	= 2.5 :1
(e) Quick Ratio	= 1.5 :1
(f) Gross Profit Ratio	= 20 % on sales
(g) Stock Turnover Ratio	= 5 times
(h) Sales for 2003	Rs. 5,00,000
(i) Trade Debtors	Rs. 70,000
(j) Opening Creditors	Rs. 40,000
(k) Closing Creditors	Rs. 30,000
(l) Closing Stock is Rs. 20,000 higher than the opening stock	

Find Out

- (a) Current Assets and Current Liabilities.
- (b) Cost of goods sold, Average stock and Purchases.
- (c) Creditor's Turnover Ratio.
- (d) Creditor's Payment Period.
- (e) Debtor's Turnover Period.
- (f) Debtor's Collection Period.
- (g) Working Capital Turnover Ratio.

Solution:**(a) Current Assets and Current Liabilities :**

Working Capital	=	Current Assets – Current Liabilities
∴ Rs. 2,52,000	=	2.5 – 1
1.5	=	Rs. 2,52,000
		<u>2,52,000</u>
1	=	1.5
	=	Rs. 1,68,000

Therefore

Current Assets	=	Rs. 1,68,000 x 2.5 = Rs. 4,20,000
Current Liabilities	=	Rs. 1,68,000 x 1 = Rs. 1,68,000

(b) Cost of goods sold, Average Stock and Purchases :

$$\begin{aligned}
 \text{Cost of Goods Sold} &= \text{Sales} - \text{Gross Profit} \\
 &= \text{Rs. } 5,00,000 - 20 \% \text{ on sales} \\
 &= \text{Rs. } 5,00,000 - 1,00,000 \\
 &= \text{Rs. } 4,00,000
 \end{aligned}$$

Average Stock

$$\begin{aligned}
 \text{Stock Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Stock}} \\
 5 \text{ times} &= \frac{4,00,000}{\text{Average Stock}} \\
 \text{Average Stock} &= \frac{4,00,000}{5} \\
 &= \text{Rs. } 80,000
 \end{aligned}$$

Purchases

$$\begin{aligned}
 \text{Cost of Goods Sold} &= \text{Opening Stock} + \text{Purchases} - \text{Closing Stock} \\
 \text{Purchases} &= \text{Cost of Goods Sold} + \text{Closing Stock} \\
 &\quad - \text{Opening Stock} \\
 \text{Average Stock} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2}
 \end{aligned}$$

Since closing stock is Rs. 20,000 higher than the opening stock

$$\begin{aligned}
 \text{Rs. } 80,000 &= \frac{\text{Opening Stock} + (\text{Rs. } 20,000 + \text{Opening Stock})}{2} \\
 \text{Rs. } 1,60,000 &= 2 \text{ Opening Stock} + \text{Rs. } 20,000 \\
 \text{Opening Stock} &= \frac{1,60,000 - 20,000}{2} = \frac{1,40,000}{2} \\
 &= \text{Rs. } 70,000 \\
 \text{Closing Stock} &= \text{Rs. } 70,000 + \text{Rs. } 20,000 = \text{Rs. } 90,000 \\
 \text{Purchases} &= \text{Rs. } 4,00,000 + 90,000 - 70,000 = \text{Rs. } 4,20,000
 \end{aligned}$$

(c) Creditor's Turnover Ratio

$$\begin{aligned}
 \text{Creditor's Turnover Ratio} &= \frac{\text{Net Credit Purchases}}{\text{Average Trade Creditors}} \\
 \text{All Purchases taken as credit purchases} & \\
 \text{Average Trade Creditors} &= \frac{\text{Opening Creditors} + \text{Closing Creditors}}{2} \\
 \text{Average Trade Creditors} &= \frac{\text{Rs. } 40,000 + \text{Rs. } 30,000}{2} \\
 &= \frac{\text{Rs. } 70,000}{2} \\
 &= \text{Rs. } 35,000
 \end{aligned}$$

(d) Creditor's Payment Period

$$\begin{aligned} \text{Creditor's Payment Period} &= \frac{\text{Month or Days in a year}}{\text{Creditor's Turnover Ratio}} \\ &= \frac{12 \text{ months}}{12} \\ &= 1 \text{ month} \end{aligned}$$

Alternatively

$$\begin{aligned} \text{Creditor's Payment Period} &= \frac{\text{Average Trade Creditor's x No. of Working Days}}{\text{Net Credit Purchases}} \\ &= \frac{35,000 \times 365}{4,20,000} \\ &= 30.41 \text{ days} \end{aligned}$$

(e) Debtor's Turnover Ratio

$$\text{Debtor's Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Trade Debtor's}}$$

It is to be noted that credit sales, opening and closing receivables are not given in the problem, so the ratio may be calculated as :

$$\begin{aligned} \text{Debtor's Turnover Ratio} &= \frac{\text{Total Sales}}{\text{Accounts Receivable or Trade Debtor's}} \\ &= \frac{\text{Rs. 5,00,000}}{\text{Rs. 70,000}} \\ &= 7.14 \text{ times} \end{aligned}$$

(f) Debtors Collection Period

$$\begin{aligned} \text{Debtor's Collection Period} &= \frac{\text{Month or Days in a year}}{\text{Debtor's Turnover Ratio}} \\ &= \frac{12 \text{ months}}{7.14} \\ &= 1.68 \text{ months} \end{aligned}$$

Alternatively

$$\begin{aligned} \text{Debtor's Collection Period} &= \frac{\text{Average Trade Debtors x No. of Working Days}}{\text{Net Annual Sales}} \\ &= \frac{70,000 \times 365}{5,00,000} \\ &= 51.1 \text{ days} \end{aligned}$$

(g) Working Capital Turnover Ratio

$$\begin{aligned}
 \text{Working Capital Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Net Working Capital}} \\
 &= \frac{\text{Rs. 4,00,000}}{\text{Rs. 2,50,000}} \\
 &= 1.6 \text{ times}
 \end{aligned}$$

(5) Fixed Assets Turnover Ratio

This ratio indicates the efficiency of assets management. Fixed Assets Turnover Ratio is used to measure the utilization of fixed assets. This ratio establishes the relationship between cost of goods sold and total fixed assets. Higher the ratio highlights a firm has successfully utilized the fixed assets. If the ratio is depressed, it indicates the under utilization of fixed assets. The ratio may also be calculated as:

$$\begin{aligned}
 \text{Fixed Assets Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Total Fixed Assets}} \\
 &\quad \text{(or)} \\
 &= \frac{\text{Sales}}{\text{Net Fixed Assets}}
 \end{aligned}$$

Components of Fixed Assets (or) Non-Current Assets

- (1) Goodwill
- (2) Land and Building
- (3) Plant and Machinery
- (4) Furniture and Fittings
- (5) Trade Mark
- (6) Patent Rights and Livestock
- (7) Long-Term Investment
- (8) Debt Balance of Profit and Loss Account
- (9) Discount on Issue of Shares
- (10) Discount on Issue of Debenture
- (11) Preliminary Expenses
- (12) Other Deferred Expenses
- (14) Government or Trust Securities
- (15) Any other immovable Prosperities

Illustration: 29

Find out Fixed Assets Turnover Ratio from the following information :

Total Fixed Assets	=	Rs. 6,00,000
Gross Profit	=	20 % on sales
Net Sales	=	Rs. 8,00,000
Debenture	=	Rs. 2,00,000
Share Capital	=	Rs. 3,00,000

Solution :

Fixed Asset Turnover Ratio	=	$\frac{\text{Cost of Goods Sold}}{\text{Total Fixed Assets}}$
Cost of Goods Sold	=	Sales – Gross Profit
	=	Rs. 8,00,000 – 20 % on sales
	=	Rs. 8,00,000 – 1,60,000 = Rs. 6,40,000
Fixed Assets Turnover Ratio	=	$\frac{\text{Rs. 6,40,000}}{\text{Rs. 6,00,000}}$
	=	1.06 times

Alternatively

Fixed Assets Turnover Ratio	=	$\frac{\text{Sales}}{\text{Net Fixed Assets}}$
	=	$\frac{\text{Rs. 8,00,000}}{\text{Rs. 6,00,000}}$
	=	1.33 times

Illustration: 30

From the following information find out Fixed Assets Turnover Ratio :

Opening Stock	Rs.	40,000
Purchases	Rs.	3,00,000
Closing Stock	Rs.	60,000
Sales	Rs.	5,00,000
Total Fixed Assets	Rs.	6,25,000
Depreciation	Rs.	25,000

Solution:

Fixed Assets Turnover Ratio	=	$\frac{\text{Cost of Goods Sold}}{\text{Total Fixed Assets}}$
Cost of goods sold	=	Opening Stock + Purchases – Closing Stock
	=	Rs. 40,000 + 3,00,000 – 60,000
	=	Rs. 2,80,000
Fixed Assets Turnover Ratio	=	$\frac{2,80,000}{6,25,000}$
	=	0.448 times

Alternatively

$$\begin{aligned}
 \text{Fixed Assets Turnover Ratio} &= \frac{\text{Sales}}{\text{Net Fixed Assets}} \\
 \text{Net Fixed Assets} &= \text{Total Fixed Assets} - \text{Depreciation} \\
 &= \text{Rs. } 6,25,000 - 25,000 = \text{Rs. } 6,00,000 \\
 \text{Fixed Assets Turnover Ratio} &= \frac{5,00,000}{6,00,000} \\
 &= 0.83 \text{ times}
 \end{aligned}$$

Illustration: 31

Find out Fixed Assets Gross Profit and Cost of Sales from the following information :

Sales Rs. 5,00,000

Gross Profit Ratio 20 %

Fixed Assets Turnover Ratio (on cost of sales) 4 times

Solution:

$$\begin{aligned}
 \text{Gross Profit} &= \text{Sales} \times \text{Gross Profit Ratio} \\
 &= \text{Rs. } 5,00,000 \times 20 \% \\
 &= 5,00,000 \times \frac{20}{100} \\
 &= \text{Rs. } 1,00,000 \\
 \text{Cost of Sales} &= \text{Sales} - \text{Gross Profit} \\
 &= \text{Rs. } 5,00,000 - 1,00,000 = \text{Rs. } 4,00,000 \\
 \text{Fixed Assets Turnover} &= \frac{\text{Cost of Sales}}{\text{Fixed Assets}} \\
 4 &= \frac{\text{Rs. } 4,00,000}{\text{Fixed Assets}} \\
 \text{Fixed Assets} &= \frac{4,00,000}{4} = \text{Rs. } 1,00,000
 \end{aligned}$$

(6) Capital Turnover Ratio

This ratio measures the efficiency of capital utilization in the business. This ratio establishes the relationship between cost of sales or sales and capital employed or shareholders' fund. This ratio may also be calculated as :

$$\begin{aligned}
 (1) \text{ Capital Turnover Ratio} &= \frac{\text{Cost of Sales}}{\text{Capital Employed}} \quad (\text{or}) \quad \frac{\text{Sales}}{\text{Capital Employed}} \\
 \text{Capital Employed} &= \text{Shareholders' Funds} + \text{Long-Term Loans} \\
 & \quad (\text{or}) \\
 &= \text{Total Assets} - \text{Current Liabilities} \\
 (2) \text{ Capital Turnover Ratio} &= \frac{\text{Cost of Sales}}{\text{Shareholders' Fund}} \quad (\text{or}) \quad \frac{\text{Sales}}{\text{Shareholders' Fund}}
 \end{aligned}$$

Components of Capital Employed (Shareholders' Fund + Long-Term Loans)

- (1) Equity Share Capital
- (2) Preference Share Capital
- (3) Debentures
- (4) Long-Term Loans
- (5) Share Premium
- (6) Credit Balance of Profit and Loss Account
- (7) Capital Reserve
- (8) General Reserve
- (9) Provisions
- (10) Appropriation of Profits

Illustration: 32

From the following information find out (a) Cost of Sales (b) Capital Employed and (c) Capital Turnover Ratio.

	<i>Rs.</i>
Total Assets	10,00,000
Bills Payable	1,50,000
Sundry Creditors	75,000
Opening Stock	50,000
Purchases	3,00,000
Closing Stock	60,000

Solution:

$$\begin{aligned}
 (a) \text{ Cost of Sales} &= \text{Opening Stock} + \text{Purchases} - \text{Closing Stock} \\
 &= \text{Rs. } 5,00,000 + 3,00,000 - 60,000 \\
 &= \text{Rs. } 7,40,000 \\
 (b) \text{ Capital Employed} &= \text{Total Assets} - \text{Current Liabilities} \\
 &= \text{Rs. } 10,00,000 - 2,25,000 = \text{Rs. } 7,75,000 \\
 (3) \text{ Capital Turnover Ratio} &= \frac{\text{Cost of Sales}}{\text{Capital Employed}} \\
 &= \frac{7,40,000}{7,75,000} \\
 &= 0.95 \text{ times}
 \end{aligned}$$

Illustration: 33

Equity Share Capital	Rs. 3,00,000
General Reserve	Rs. 50,000
Preference Share Capital	Rs. 2,00,000
Long-Term Loans	Rs. 1,50,000
Profit and Loss Account (Credit Balance)	Rs. 70,000
Total Sales	Rs. 10,00,000
Gross Profit	Rs. 80,000

From the above information find out Capital Turnover Ratio

Solution:

$$\begin{aligned}
 \text{Capital Turnover Ratio} &= \frac{\text{Sales}}{\text{Capital Employed}} \\
 \text{Capital Employed} &= \text{Shareholder fund} + \text{Long-Term Loans} \\
 &= \text{Equity Share Capital} + \text{General Reserve} \\
 &\quad + \text{Preference Share Capital} + \text{Long-Term Loans} \\
 &\quad + \text{Credit Balance of P \& L A/c} \\
 &= \text{Rs. } 3,00,000 + 50,000 + 2,00,000 + 1,50,000 + 70,000 \\
 &= \text{Rs. } 7,70,000 \\
 \text{Capital Turnover Ratio} &= \frac{10,00,000}{7,70,000} \\
 &= 1.29 \text{ times}
 \end{aligned}$$

Alternatively

$$\begin{aligned}
 \text{Capital Turnover Ratio} &= \frac{\text{Cost of Sales}}{\text{Capital Employed}} \\
 \text{Cost of Sales} &= \text{Sales} - \text{Gross Profit} \\
 &= \text{Rs. } 10,00,000 - \text{Rs. } 80,000 \\
 &= \text{Rs. } 9,20,000 \\
 \text{Capital Turnover Ratio} &= \frac{9,20,000}{7,70,000} \\
 &= 1.19 \text{ times}
 \end{aligned}$$

IV. SOLVENCY RATIOS

The term 'Solvency' generally refers to the capacity of the business to meet its short-term and long-term obligations. Short-term obligations include creditors, bank loans and bills payable etc. Long-term obligations consists of debenture, long-term loans and long-term creditors etc. Solvency Ratio indicates the sound financial position of a concern to carry on its business smoothly and meet its all obligations. Liquidity Ratios and Turnover Ratios concentrate on evaluating the short-term solvency of the concern have already been explained. Now under this part of the chapter only the long-term solvency ratios are dealt with. Some of the important ratios which are given below in order to determine the solvency of the concern :

- (1) Debt – Equity Ratio
- (2) Proprietary Ratio
- (3) Capital Gearing Ratio
- (4) Debt Service Ratio or Interest Coverage Ratio

(1) Debt Equity Ratio

This ratio also termed as External – Internal Equity Ratio. This ratio is calculated to ascertain the firm's obligations to creditors in relation to funds invested by the owners. The ideal Debt Equity Ratio is 1:1. This ratio also indicates all external liabilities to owner recorded claims. It may be calculated as

$$(a) \text{ Debt – Equity Ratio} = \frac{\text{External Equities}}{\text{Internal Equities}}$$

(or)

$$(b) \text{ Debt – Equity Ratio} = \frac{\text{Outsider's Funds}}{\text{Shareholders' Funds}}$$

The term External Equities refers to total outside liabilities and the term Internal Equities refers to all claims of preference shareholders and equity shareholders' and reserve and surpluses.

$$(c) \text{ Debt – Equity Ratio} = \frac{\text{Total Long-Term Debt}}{\text{Total Long-Term Funds}}$$

(or)

$$(d) \text{ Debt – Equity Ratio} = \frac{\text{Total Long-Term Debt}}{\text{Shareholders' Funds}}$$

The term Total Long-Term Debt refers to outside debt including debenture and long-term loans raised from banks.

Illustration: 34

From the following figures calculate Debt Equity Ratio :

	Rs.
Preference Share Capital	1,50,000
Equity Share Capital	5,50,000
Capital Reserve	2,00,000
Profit and Loss Account	1,00,000
6 % Debenture	2,50,000
Sundry Creditors	1,20,000
Bills Payable	60,000
Provision for taxation	90,000
Outstanding Creditors	80,000

Solution:

$$(a) \text{ Debt Equity Ratio} = \frac{\text{External Equities}}{\text{Internal Equities}}$$

$$\text{External Equities} = \text{Debenture} + \text{Sundry Creditors} + \text{Bills Payable} + \text{Provision for taxation} + \text{Outstanding Creditors}$$

$$= \text{Rs. } 2,50,000 + 1,20,000 + 60,000 + 90,000 + 80,000$$

$$= \text{Rs. } 6,00,000$$

$$\text{Internal Equities} = \text{Preference Share Capital} + \text{Equity Share Capital} + \text{Capital Reserve} + \text{Profit and Loss A/c}$$

$$= \text{Rs. } 1,50,000 + 5,50,000 + 2,00,000 + 1,00,000$$

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

	=	$\frac{6,00,000}{10,00,000}$	= 0.6 (or) 3 : 5
(b) Debt Equity Ratio	=	$\frac{\text{Total Long-Term Debt}}{\text{Shareholders' Funds}}$	
Total Long-Term Debt	=	Rs. 2,50,000	
Shareholders' Fund	=	Rs. 10,00,000	
Debt-Equity Ratio	=	$\frac{Rs. 2,50,000}{Rs. 10,00,000}$	
	=	0.25	
(c) Debt Equity Ratio	=	$\frac{\text{Total Long-term Debt}}{\text{Total Long-term Funds}}$	
	=	$\frac{2,50,000}{12,50,000}$	
	=	0.2	
(d) Debt Equity Ratio	=	$\frac{\text{Outsider's Fund}}{\text{Shareholders' Fund}}$	
Outsider's Fund	=	Total Outside Liabilities	
	=	Rs. 6,00,000	
Debt Equity Ratio	=	$\frac{6,00,000}{10,00,000}$	
	=	0.6 (or) 3 : 5	

Significance : This ratio indicates the proportion of owner's stake in the business. Excessive liabilities tend to cause insolvency. This ratio also tell the extent to which the firm depends upon outsiders for its existence.

(2) Proprietary Ratio

Proprietary Ratio is also known as Capital Ratio or Net Worth to Total Asset Ratio. This is one of the variant of Debt-Equity Ratio. The term proprietary fund is called Net Worth. This ratio shows the relationship between shareholders' fund and total assets. It may be calculated as :

	=	$\frac{\text{Shareholders' Fund}}{\text{Total Assets}}$	
Shareholders' Fund	=	Preference Share Capital + Equity Share Capital + All Reserves and Surplus	
Total Assets	=	Tangible Assets + Non-Tangible Assets + Current Assets (or) All Assets including Goodwill	

Significance : This ratio used to determine the financial stability of the concern in general. Proprietary Ratio indicates the share of owners in the total assets of the company. It serves as an indicator to the creditors who can find out the proportion of shareholders' funds in the total assets employed in the business. A higher proprietary ratio indicates relatively little secure position in the event of solvency of a concern. A lower ratio indicates greater risk to the creditors. A ratio below 0.5 is alarming for the creditors.

Illustration: 35

From the following informations calculate the Proprietary Ratio :

	<i>Rs.</i>
Preference Share Capital	2,00,000
Equity Share Capital	4,00,000
Capital Reserve	50,000
Profit and Loss Account	50,000
9% Debenture	2,00,000
Sundry Creditors	50,000
Bills Payable	50,000
Land and Building	2,00,000
Plant and Machinery	2,00,000
Goodwill	1,00,000
Investments	3,00,000

Solution:

$$\begin{aligned}
 \text{Proprietary Ratio} &= \frac{\text{Shareholders' Fund}}{\text{Total Assets}} \\
 \text{Shareholders' Fund} &= \text{Preference Share Capital} + \text{Equity Share Capital} \\
 &+ \text{Capital Reserve} + \text{Profit and Loss Account} \\
 &= \text{Rs. } 2,00,000 + 4,00,000 + 50,000 + 50,000 \\
 &= \text{Rs. } 7,00,000 \\
 \text{Total Assets} &= \text{Land and Building} + \text{Plant and Machinery} \\
 &+ \text{Goodwill} + \text{Investments} \\
 &= \text{Rs. } 2,00,000 + 2,00,000 + 1,00,000 + 3,00,000 \\
 &= \text{Rs. } 8,00,000 \\
 \text{Proprietary Ratio} &= \frac{7,00,000}{8,00,000} \\
 &= 87.5\% \text{ (or) } 0.87
 \end{aligned}$$

(3) Capital Gearing Ratio

This ratio also called as Capitalization or Leverage Ratio. This is one of the Solvency Ratios. The term capital gearing refers to describe the relationship between fixed interest and/or fixed dividend bearing securities and the equity shareholders' fund. It can be calculated as shown below :

$$\begin{aligned}
 \text{Capital Gearing Ratio} &= \frac{\text{Equity Share Capital}}{\text{Fixed Interest Bearing Funds}} \\
 \text{Equity Share Capital} &= \text{Equity Share Capital} + \text{Reserves and Surplus} \\
 \text{Fixed Interest Bearing Funds} &= \text{Debentures} + \text{Preference Share Capital} \\
 &+ \text{Other Long-Term Loans}
 \end{aligned}$$

A high capital gearing ratio indicates a company is having large funds bearing fixed interest and/or fixed dividend as compared to equity share capital. A low capital gearing ratio represents preference share capital and other fixed interest bearing loans are less than equity share capital.

Illustration: 36

From the following information, you are required to find out Capital Gearing Ratio

	Rs.
Preference Share Capital	5,00,000
Equity Share Capital	6,00,000
Capital Reserve	3,00,000
Profit and Loss Account	1,00,000
12% Debenture	3,00,000
Secured loan	1,00,000

Solution:

$$\begin{aligned}
 \text{Capital Gearing Ratio} &= \frac{\text{Equity Share Capital}}{\text{Fixed Interest Bearing Funds}} \\
 \text{Equity Share Capital} &= \text{Equity Share Capital} + \text{Capital Reserve} \\
 &+ \text{Profit and Loss Account} \\
 &= \text{Rs. } 6,00,000 + 3,00,000 + 1,00,000 \\
 &= \text{Rs. } 10,00,000 \\
 \text{Fixed Interest Bearing Funds} &= \text{Debenture} + \text{Preference Share Capital} \\
 &+ \text{Secured Loans} \\
 &= \text{Rs. } 3,00,000 + 5,00,000 + 1,00,000 \\
 &= \text{Rs. } 9,00,000 \\
 \text{Capital Gearing Ratio} &= \frac{10,00,000}{9,00,000} \\
 &= 10 : 9 \text{ (Low Gear)}
 \end{aligned}$$

(4) Debt Service Ratio

Debt Service Ratio is also termed as Interest Coverage Ratio or Fixed Charges Cover Ratio. This ratio establishes the relationship between the amount of net profit before deduction of interest and tax and the fixed interest charges. It is used as a yardstick for the lenders to know the business concern will be able to pay its interest periodically. Debt Service Ratio is calculated with the help of the following formula :

$$\text{Interest Coverage Ratio} = \frac{\text{Net Profit before Interest and Income Tax}}{\text{Fixed Interest Charges}} \times 100$$

Illustration: 37

Calculate Interest Coverage Ratio :	
Profit before Interest	= Rs. 7,00,000
Income Tax Paid	= Rs. 50,000
Interest On Debenture	= Rs. 3,00,000
Interest on Long-Term Loan	= Rs. 1,00,000

Solution:

$$\begin{aligned}
 \text{Interest Coverage Ratio} &= \frac{\text{Net Profit before Interest and Income Tax}}{\text{Fixed Interest Charges}} \times 100 \\
 \text{Net Profit before Interest} & \left. \begin{array}{l} \text{and Taxes} \end{array} \right\} = \text{Rs. } 7,00,000 + 50,000 \\
 &= \text{Rs. } 7,50,000
 \end{aligned}$$

$$\begin{aligned}
 \text{Fixed Interest Charges} &= \text{Rs. } 3,00,000 + 1,00,000 \\
 &= \text{Rs. } 4,00,000 \\
 \text{Interest Coverage Ratio} &= \frac{7,50,000}{4,00,000} \times 100 \\
 &= 187.5 \% \text{ (or) } 1.87 : 1
 \end{aligned}$$

Significance : Higher the ratio the more secure the debentureholders and other lenders would be with respect to their periodical interest income. In other words, better is the position of long-term creditors and the company's risk is lesser. A lower ratio indicates that the company is not in a position to pay the interest but also to repay the principal loan on time.

V. OVERALL PROFITABILITY RATIO

This ratio used to measure the overall profitability of a firm on the extent of operating efficiency it enjoys. This ratio establishes the relationship between profitability on sales and the profitability on investment turnover. Overall all Profitability Ratio may be calculated in the following ways :

$$\text{Overall Profitability Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$$

DU Pont Control Chart (or) DU Pont Analysis

ROI indicates the efficiency of the concern which depends upon the working operations of the concern. Net Profit Ratio and Capital Turnover Ratio, as often called is usually computed on the basis of the chart represented by DU Pont. Thus it is known as "DU Pont Chart." This system of control was applied for the first time by DU Pont company of the United States of America. The DU Pont chart helps to the management to identify the areas of problems for the variations in the return on investment so that actions may initiated to improve the performance. The following chart can explain the ROI effect by a number of factors.

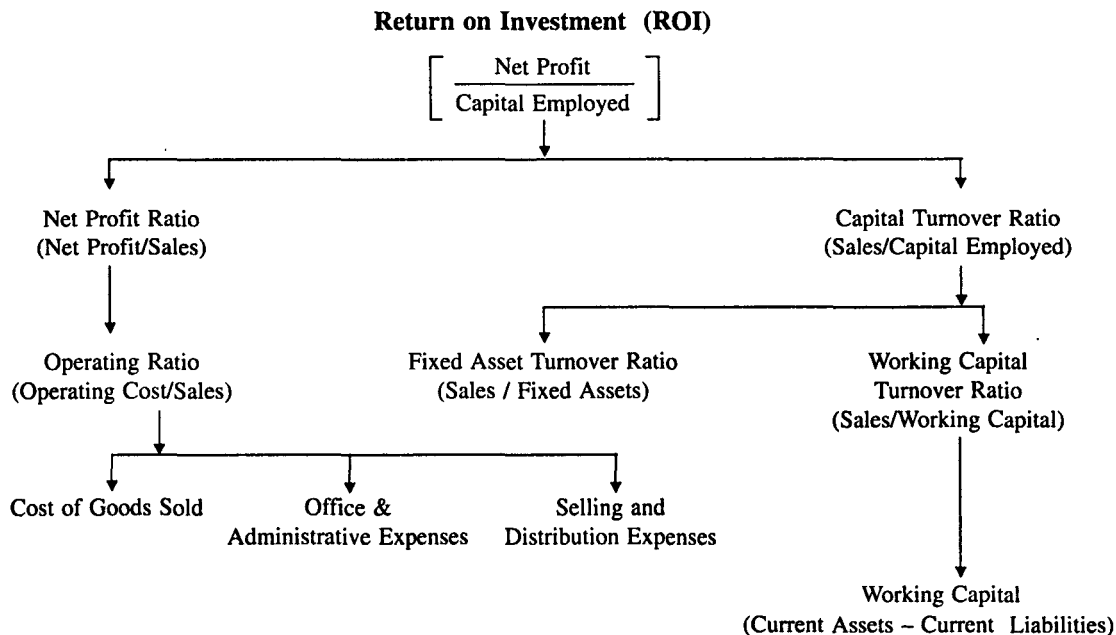


Illustration: 38

The following are the Profit and Loss Account and Balance Sheet of Mrs. Sharma Ltd. for the purpose of analysis and calculate (a) Liquidity Ratios (b) Profitability Ratios (c) Turnover Ratios (d) Solvency Ratios and (e) Overall Profitability Ratio.

Dr. Profit and Loss Account of Sharma Ltd. Cr.

<i>Particulars</i>	<i>Rs.</i>	<i>Particulars</i>	<i>Rs.</i>
To Opening Stock :		By Sales	5,00,000
Raw Materials	25,000	By Closing Stock :	
Finished goods	50,000	Raw Materials	75,000
To Purchases	1,50,000	Finished Goods	50,000
To Wages	1,00,000	By Profit on Sale of Investments	25,000
To Factory Expenses	50,000		
To Administrative Expenses	25,000		
To Selling & Distribution Expenses	25,000		
To Loss on Sale of Machinery	25,000		
To Interest on Debenture	5,000		
To Net Profit	1,95,000		
	6,50,000		6,50,000

Balance Sheet

<i>Liabilities</i>	<i>Rs.</i>	<i>Assets</i>	<i>Rs.</i>
Equity Share Capital @ Rs. 10 each	50,000	Plant & Machinery	50,000
10% Preference Share Capital	50,000	Land & Building	50,000
Retained Earnings	50,000	Furniture	25,000
12 % Debenture	1,00,000	Stock of raw material	75,000
Sundry Creditors	50,000	Sundry Debtors	50,000
Bills Payable	25,000	Bank Balance	25,000
	3,25,000	Stock of finished goods	50,000
			3,25,000

Solution:**Profit and Loss Account of M/s Sharma Ltd.**

<i>Particulars</i>	<i>Rs.</i>	<i>Particulars</i>	<i>Rs.</i>
To Opening Stock :		By Sales	5,00,000
Raw Materials	25,000		
Add : Purchases	1,50,000		
	1,75,000		
Less : Closing Stock of Raw Materials	75,000		
Raw Materials Consumed -1	1,00,000		
To Wages	1,00,000		
To Factory Expenses	50,000		
Cost of Production - 2	2,50,000		
Add : Opening Stock of Finished Goods	50,000		
	3,00,000		
Less : Closing Stock of Finished Goods	50,000		
Cost of Goods Sold - 3	2,50,000		
To Gross Profit c/d	2,50,000		
	5,00,000		5,00,000

To Administrative Expenses	25,000	By Gross Profit b/d	2,50,000
To Selling and Distribution Expenses	25,000		
Operating Expenses – 5	50,000		
To Operating Profit c/d – 6	2,00,000		
	2,50,000		2,50,000
To Loss on Sale of Plant	25,000	By Operating Profit b/d By Profit on Sale of investment (Non-operating income)	2,00,000
To Interest on Debenture	5,000		
Non-operating Expenses – 7	30,000		
To Net Profit - 8	1,95,000		
	2,25,000		

Balance Sheet

Particulars	Rs.	Rs.	
Plant and Machinery	50,000	1,25,000	
Land and Building	50,000		
Furniture	25,000		
Fixed Assets – 1			
Bank Balances	25,000		
Sundry Debtors	50,000		
Liquid Assets – 2	75,000		
Stock of Raw Materials	75,000		
Stock of Finished Goods	50,000		
Current Assets – 3	2,00,000		
Sundry Creditors	50,000	1,25,000	
Bills Payable	25,000		
Current Liabilities – 4	75,000		
Working Capital (3 – 4) = 5 (Current Assets – Current Liabilities)	1,25,000		
Capital Employed (1+5) = 6 (Fixed Assets + Working Capital)			2,50,000
Less : Long-Term Debt:			
12 % Debenture			1,00,000
Shareholders' Fund – 7			1,50,000
Less : Preference Share Capital			50,000
Equity Shareholders' Fund or Net Worth – 8			1,00,000
Net Worth Represented by :			
Equity Share Capital	50,000		
Retained Earnings	50,000		
Equity Shareholders' Net Worth	1,00,000		

$$\begin{aligned}
 (1) \text{ Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Sales}} \times 100 \\
 &= \frac{2,50,000}{5,00,000} \times 100 = 50\%
 \end{aligned}$$

(2) <i>Net Profit Ratio</i>	=	$\frac{\text{Net Profit}}{\text{Sales}} \times 100$	
	=	$\frac{1,95,000}{5,00,000} \times 100 = 39\%$	
(3) <i>Operating Ratio</i>	=	$\frac{\text{Operating Cost}}{\text{Sales}} \times 100$	
	=	$\frac{50,000}{5,00,000} \times 100 = 10\%$	
(4) <i>Operating Profit Ratio</i>	=	$\frac{\text{Operating Profit}}{\text{Sales}} \times 100$	
	=	$\frac{2,00,000}{5,00,000} \times 100 = 40\%$	
(5) <i>Return on Investment Ratio</i>	=	$\frac{\text{Net Profit after Interest and Tax}}{\text{Shareholders' Fund}} \times 100$	
Net Profit after Interest & Tax	=	Net Profit – (Interest and Taxes)	
Tax Net Profit	=	Rs. 1,95,000	
12% on Debenture	=	Rs. 18,000	
Net Profit after Interest & Tax	=	Rs. 1,95,000 – 18,000	
	=	Rs. 1,77,000	
Return on Investment Ratio	=	$\frac{1,77,000}{1,50,000} \times 100$	
	=	118 %	
(6) <i>Return on Capital Employed Ratio</i> }	=	$\frac{\text{Net Profit after Tax}}{\text{Capital Employed}} \times 100$	
	=	$\frac{1,95,000}{2,50,000} \times 100$	
	=	78%	
(7) <i>Earning Per Equity Share Ratio</i> }	=	$\frac{\text{Net Profit after and Preference Dividend}}{\text{No. of Equity Shares}}$	
	=	$\frac{1,95,000}{5,000} = \text{Rs. } 39$	
(8) <i>Net Profit to Net Worth Ratio</i>	=	$\frac{\text{Net Profit after Taxes}}{\text{Shareholders' Net Worth}} \times 100$	
	=	$\frac{1,95,000}{1,50,000} \times 100 = \text{Rs. } 130\%$	

$$\begin{aligned}
 (9) \quad \text{Stock Turnover Ratio (or)} & \quad \left. \begin{array}{l} \text{Stock Velocity} \end{array} \right\} & = & \frac{\text{Cost of Goods Sold}}{\text{Average Stock}} \\
 & & & = \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\
 \text{Average Stock} & & = & \frac{(25,000 + 50,000) + (75,000 + 50,000)}{2} \\
 & & = & \frac{75,000 + 1,25,000}{2} \\
 & & = & \frac{\text{Rs. } 2,00,000}{2} = 1,00,000 \\
 \text{Stock Turnover Ratio} & & = & \frac{2,50,000}{1,00,000} = 2.5 \text{ times} \\
 \\
 (10) \quad \text{Debtors' Turnover Ratio} & & = & \frac{\text{Credit Sales}}{\text{Average Receivables}} \\
 & & = & \frac{5,00,000}{50,000} = 10 \text{ times} \\
 \\
 (11) \quad \text{Creditors' Turnover Ratio} & & = & \frac{\text{Credit Purchases}}{\text{Average Payables}} \\
 & & = & \frac{1,00,000}{50,000} = 2 \text{ times} \\
 \\
 (12) \quad \text{Working Capital Turnover Ratio} & & = & \frac{\text{Net Sales}}{\text{Working Capital}} \\
 & & = & \frac{5,00,000}{1,25,000} = 4 \text{ times} \\
 \\
 (13) \quad \text{Fixed Assets Turnover Ratio} & & = & \frac{\text{Cost of Goods Sold}}{\text{Total Fixed Assets}} \\
 & & = & \frac{2,50,000}{1,25,000} = 2 \text{ times} \\
 \\
 (14) \quad \text{Capital Turnover Ratio} & & = & \frac{\text{Sales}}{\text{Capital Employed}} \\
 & & = & \frac{5,00,000}{2,50,000} = 2 \text{ times} \\
 \\
 (15) \quad \text{Current Ratio} & & = & \frac{\text{Current Assets}}{\text{Current Liabilities}} \\
 & & = & \frac{2,00,000}{75,000} = 2.66 \text{ times}
 \end{aligned}$$

(16) <i>Liquid Ratio</i>	=	$\frac{\text{Liquid Assets}}{\text{Current Liabilities}}$	
	=	$\frac{75,000}{75,000} = 1 \text{ time}$	
(17) <i>Absolute Liquid Assets</i>	=	$\frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$	
	=	$\frac{25,000}{75,000} = 0.33 \text{ times}$	
(18) <i>Debt Equity Ratio</i>	=	$\frac{\text{Total Long-Term Debt}}{\text{Shareholders' Fund}}$	
	=	$\frac{1,00,000}{1,50,000} = 0.66 \text{ times}$	
(19) <i>Proprietary Ratio</i>	=	$\frac{\text{Shareholders' Fund}}{\text{Total Assets}}$	
	=	$\frac{1,50,000}{3,25,000} = 0.46 \text{ times}$	
(20) <i>Capital Gearing Ratio</i>	=	$\frac{\text{Equity Share Capital}}{\text{Fixed Interest Bearing Funds}}$	
Fixed Interest Bearing Funds	=	Debenture + Preference Share Capital + Other Long-Term Loans Rs. 1,00,000 + 50,000 = Rs. 1,50,000	
Capital Gearing Ratio	=	$\frac{1,00,000}{1,50,000} = 0.66 \text{ times}$	
(21) <i>Overall Profitability Ratio</i>	=	$\frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$	
	=	$\frac{195000}{500000} \times \frac{500000}{325000} = 0.6 \text{ times}$	

SUMMARY OF RATIOS

I. Liquidity Ratios

S. No.	Ratio to be Computed	Formula	Components
1	Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	1. Current Assets 2. Current Liabilities
2	Quick Ratio (or) Acid Test Ratio (or) Liquid Ratio	$\frac{\text{Liquid Assets}}{\text{Current Liabilities}}$	1. Liquid Assets = Current Assets – (Stock Liquid Ratio & Prepaid Expenses) 2. Current Liabilities

3	Absolute Liquid Ratio (or) Cash Position Ratio	$\frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$	<ol style="list-style-type: none"> 1. Absolute Liquid Assets = Cash in Hand + Cash at Bank + Marketable Securities 2. Current Liabilities
---	---	--	---

II. Profitability Ratios

S. No.	Ratio to be Computed	Formula	Components
1	Gross Profit Ratio	$\frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$	<ol style="list-style-type: none"> 1. Gross Profit = (Sales – Cost of goods sold) 2. Net Sales = (Gross Sales – Sales Return)
2	Operating Ratio	$\frac{\text{Operating Cost}}{\text{Net Sales}} \times 100$	<ol style="list-style-type: none"> 1. Operating Cost = (Cost of goods Sold + Administrative Expenses + Selling and Distribution Expenses) 2. Net Sales
3	Operating Profit Ratio	$\frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$	<ol style="list-style-type: none"> 1. Operating Profit = (Net Sales – Operating Cost) 2. Net Sales
4	Net Profit Ratio	$\frac{\text{Net Profit after tax}}{\text{Net Sales}} \times 100$	<ol style="list-style-type: none"> 1. Net Profit after tax = (Net Profit – Tax paid) 2. Net Sales
5	Return on Investment Ratio	$\frac{\text{Net Profit after Interest and Taxes}}{\text{Shareholders' Funds or Investments}} \times 100$	<ol style="list-style-type: none"> 1. Net Profit = Net Profit – Interest and Taxes 2. Shareholders' Investment = (Equity Share Capital + Preference Share Capital + Reserves and Surplus – Accumulated Losses)
6	Return on Capital Employed Ratio	$\frac{\text{Net Profit after taxes}}{\text{Gross Capital Employed}} \times 100$ (or) $\frac{\text{Net Profit after taxes before Interest}}{\text{Gross Capital Employed}} \times 100$ (or) $\frac{\text{Net Profit after taxes before Interest}}{\text{Average Capital Employed or Net Capital Employed}} \times 100$	<ol style="list-style-type: none"> 1. Net Profit after tax = (Net Profit – Tax Paid) 2. Gross Capital Employed = (Fixed Assets + Current Assets) 3. Average Capital Employed = $\frac{\text{Opening Capital Employed} + \text{Closing Capital Employed}}{2}$ (or) Average Capital Employed = Net Capital Employed + ½ of Profit after tax 4. Net Capital Employed = (Total Assets – Current Liabilities)
7	Earning Per Share Ratio	$\frac{\text{Net Profit after Tax and Preference Dividend}}{\text{No. of Equity Shares}}$	<ol style="list-style-type: none"> 1. Net Profit after tax and preference dividend = Net Profit – (Tax paid + Preference Dividend) 2. No. of Equity Shares

8	Dividend Pay Out Ratio	$\frac{\text{Equity Dividend}}{\text{Net Profit after tax and Preference Dividend}} \times 100$ (or) $\frac{\text{Dividend Per Equity Share}}{\text{Earning Per Equity Share}} \times 100$	1. Equity Dividend = (No. of Equity Shares x Dividend Per Equity Share) 2. Net Profit after tax and preference dividend = Net Profit – (Tax Paid + Preference Dividend)
9	Earning Per Equity Share	$\frac{\text{Net Profit after tax and Preference Dividend}}{\text{No. of Equity Shares}}$	1. No. of Equity Shares 2. Net Profit after tax and Preference Dividend
10	Dividend Yield Ratio	$\frac{\text{Dividend Per share}}{\text{Market Value Per Share}} \times 100$	1. Dividend Per Share 2. Market Value Per Share
11	Price Earning Ratio	$\frac{\text{Market Price Per Share Equity Share}}{\text{Earning Per Share}} \times 100$	1. Market Price Per Equity Share 2. Earning Per Share
12	Net Profit to Net Worth Ratio	$\frac{\text{Net Profit after taxes}}{\text{Shareholders Net Worth}} \times 100$	1. Net Profit after taxes 2. Shareholder Net Worth = (Company's Net Assets – Long-Term Liabilities) (or) Total Tangible Net Worth = (Shareholders' fund + Profits Retained in business)

III. Turnover Ratios

S. No.	Ratio to be Computed	Formula	Components
1	Inventory Ratio (or) Stock Turnover Ratio (or) Stock Velocity	$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory at cost Net Sales}} \text{ (or)}$ $\frac{\text{Average Inventory at cost Net Sales}}{\text{Average Inventory at Selling Price}} \text{ (or)}$ $\frac{\text{Net Sales}}{\text{Inventory}}$	1. Cost of Goods Sold = (Opening Stock + Purchases + Direct Expenses – Closing Stock) 2. Cost of Goods Sold = (Sales – Gross Profit) 3. Average Stock = $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$

2	Debtors' Turnover Ratio	$\frac{\text{Net Credit Sales}}{\text{Average Receivables (or) Average Accounts Receivables (or) Total Sales}} \times \frac{\text{Account Receivable}}{\text{Account Receivable}}$	<ol style="list-style-type: none"> 1. Net Credit Sales = (Total Sales – Cash Sales) 2. Accounts Receivables = (Sundry Debtors + Bills Receivables) Average Accounts = $\frac{\text{Opening Receivable} + \text{Closing Receivable}}{2}$
3	Debt Collection Period Ratio	$\frac{\text{Month or Days in a year}}{\text{Debtors Turnover (or) Average Accounts Receivable} \times \frac{\text{Months or Days in a year}}{\text{Net Credit Sales for the year}}}$	<ol style="list-style-type: none"> 1. Months or Days in a year 2. Net Credit Sales 3. Net Credit Sales = (Total Sales – Cash Sales) 4. Average Accounts Receivable
4	Creditors' Turnover Ratio	$\frac{\text{Net Credit Purchases}}{\text{Average Accounts Payable}}$	<ol style="list-style-type: none"> 1. Net Credit Purchases = Total Purchases – Cash Purchases 2. Average Accounts Payable = $\frac{\text{Opening Payable} + \text{Closing Payable}}{2}$
5	Average Payment Period	$\frac{\text{Month or Days in a year}}{\text{Creditors' Turnover Ratio (or) Average Trade Creditors}} \times \frac{\text{Net Credit Purchases}}{\text{Net Credit Purchases}} \times 100$	<ol style="list-style-type: none"> 1. Month or Days in a year 2. Average Trade Creditors 3. Creditors' Turnover Ratio 4. Net Credit Purchase
6	Working Capital Turnover Ratio	$\frac{\text{Net Sales}}{\text{Working Capital}}$	<ol style="list-style-type: none"> 1. Net Sales = (Gross Sales – Sales Return) 2. Working Capital = (Current Assets – Current Liabilities)
7	Fixed Assets Turnover Ratio	$\frac{\text{Cost of goods sold}}{\text{Total Fixed Assets (or) Sales}} \times \frac{\text{Net fixed Assets}}{\text{Net fixed Assets}}$	<ol style="list-style-type: none"> 1. Cost of Goods Sold 2. Total Fixed Assets 3. Sales 4. Net Fixed Assets
8	Capital Turnover Ratio	$\frac{\text{Cost of Sales}}{\text{Capital Employed (or) Sales}} \times \frac{\text{Capital Employed (or) Cost of Sales or Sales}}{\text{Shareholders' Fund}}$	<ol style="list-style-type: none"> 1. Capital Employed = (Total Assets – Current Liabilities) (or) Capital Employed = (Shareholders' Fund + Long-Term Loans) 2. Cost of Sales (or) Sales

IV. Solvency Ratios

S. No.	Ratio to be Computed	Formula	Components
1	Debt Equity Ratio	$\frac{\text{External Equities}}{\text{Internal Equities} \quad (\text{or}) \quad \text{Outsiders' Funds}}$ $\frac{\text{Shareholders' Funds}}{\text{Total Long-Term Debt} \quad (\text{or}) \quad \text{Total Long-Term Funds}}$ $\frac{\text{Total Long-Term Debt}}{\text{Shareholders' Funds}}$	<ol style="list-style-type: none"> 1. External Equities = Total Outside Liabilities 2. Internal Equities = All claims of preference shareholders + Equity shareholders + Reserves and Surplus 3. Total Long-Term Debt = Outside Debt (Debenture and Long-Term Loans)
2	Proprietary Ratio	$\frac{\text{Shareholders' Fund}}{\text{Total Assets}}$	<ol style="list-style-type: none"> 1. Shareholders' fund = Preference Share Capital + Equity Share Capital + All Reserves and surplus 2. Total Assets = Tangible Assets + Non-Tangible Assets + Current Assets (or) All assets including Goodwill
3	Capital Gearing Ratio	$\frac{\text{Equity Share Capital}}{\text{Fixed Interest Bearing Funds}}$	<ol style="list-style-type: none"> 1. Equity Share Capital = Equity Share Capital + Reserves and Surplus 2. Fixed Interest Bearing Funds = (Debentures + Preference Share Capital + Other Long-Term Loans)
4	Debt Service Ratio	$\frac{\text{Net Profit before Interest and Taxes}}{\text{Fixed Interest Charges}}$	<ol style="list-style-type: none"> 1. Net Profit before Interest and Taxes 2. Fixed Interest Charges

V. Over All Profitability Ratios

S. No.	Ratio to be Computed	Formula	Components
V	Overall Profit Ability Ratio	$\frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$ $\frac{\text{Net Profit}}{\text{Total Assets}}$	<ol style="list-style-type: none"> 1. Net Profit 2. Sales 3. Total Assets

QUESTIONS

1. What is meant by Ratio?
2. What do understand by Accounting Ratio? Explain the Principles of ratio selection.
3. What are the advantages of Ratio Analysis?
4. What are the limitations of ratio analysis?
5. What are the different categories of ratios? How are they classified?

6. Write short notes on :
- (a) Liquidity Ratios. (b) Profitability Ratios. (c) Turnover Ratios.
 (d) Solvency Ratios. (e) Overall Profitability Ratios.
7. What do you understand by current ratio? What are its uses? What are its limitations?
8. Ratio analysis is widely used as a tool of financial analysis, yet it suffers from various limitations. Explain.
9. How can solvency of a firm be measured?
10. What do you understand by Liquidity ratios? Discuss their significance.
11. Explain the importance of profitability Ratio. How they are worked out?
12. Discuss the usefulness of the following ratios :
- (a) Inventory Ratio. (b) Operating Ratio. (c) Price Earning Ratio.
 (d) Creditor's Turnover Ratio. (e) Debtor's Turnover Ratio.

EXERCISES

- (1) From the following, compute both the purchases made during the year and the Stock Turnover Ratio :

	Rs.
Inventory (at cost price) :	
At the beginning	14,000
At the end of the year	21,000
Sales revenue	1,20,000
Sales return	6,000
Gross profit	26,500

[Ans : Purchases Rs. 94,500; Stock Turnover Ratio = 5 times]

- (2) From the following particulars, you are required to find out :

(a) Current Ratio, (b) Net Profit Ratio; and (c) Gross Profit Ratio.

Stock	Rs. 50,000	Cash in Hand	Rs. 30,000
Debtors	Rs. 40,000	Creditors	Rs. 60,000
Bills Receivable	Rs. 10,000	Bills Payable	Rs. 40,000
Advances	Rs. 4,000	Bank Overdraft	Rs. 4,000
		Sales (Net)	Rs. 7,00,000
		Gross Profit	Rs. 50,000
		Net Profit	Rs. 30,000

[Ans: Current Ratio = 1.28:1; Net Profit Ratio = 4.29%; Gross Profit Ratio = 7.14%].

- (3) Calculate: (a) Current Assets; (b) Liquid Assets; (c) Inventory.

Current Ratio = 2.6 : 1
 Liquid Ratio = 1.5 : 1
 Current Liabilities = Rs. 40,000

[Ans : Current Assets Rs. 1,04,000 ; Liquid Assets Rs. 60,000; Inventory Rs. 44,000]

- (4) From the following details, you are required to find out :

(a) Gross profit; (b) Purchases; (c) Opening Stock; (d) Closing Stock; (e) Debtors; (f) Creditors; (g) Fixed Assets

(1) Stock Velocity = 6
 (2) Capital Turnover Ratio = 2
 (3) Fixed Turnover Ratio = 4
 (4) Gross Profit Turnover Ratio = 20%
 (5) Debtor's Velocity = 2 months
 (6) Creditor's Velocity = 73 days

The Gross Profit was Rs. 60,000. Reserve and surplus amount to Rs. 20,000. Closing stock was Rs. 5,000 in excess on opening stock.

[Ans : (a) Rs. 60,000; (b) Rs. 2,45,000; (c) Rs. 37,500; (d) Rs. 42,500; (e) Rs. 50,000; (f) Rs. 49,000; (g) Rs. 60,000].

- (5) From the following Profit and Loss Account and Balance sheet, compute : (1) Current Ratio (2) Liquid Ratio (3) Fixed Asset to Net Worth Ratio (4) Proprietary Ratio (5) Debt Equity Ratio (6) Operating Ratio (7) Stock Turnover Ratio (8) Fixed Assets Turnover Ratio (9) Creditors Turnover Ratio (10) Gross Profit Turnover Ratio (11) Net Profit to Sales Ratio (12) Return on Investment Ratio.

Dr.		Profit and Loss Account for the year ended 31.12.2002		Dr.	
Particulars		Rs.	Particulars		Rs.
To Opening Stock of Raw materials		5,000	By Sales	50,000	
To Purchases	32,000		Less: Return	1,000	49,000
Less : Returns	2,000	30,000	By Closing Stock of Raw Materials		8,750
To Factory Expenses		1,000			
To Gross profit c/d		21,750			
		57,750			57,750
To Operating expenses		8,750			
To Interest on Debenture		400	By Gross Profit b/d		21,750
To Provision for income tax		6,300			
To Net Profit		6,300			
		21,750			21,750

Balance Sheet as on 31st Dec. 2003

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	12,500	Land & Building	10,000
Capital Reserves	5,000	Plant & Machinery	6,000
Profit and Loss Account	2,500	Stock	8,750
8 % Debenture	5,000	Debtors	4,500
Sundry Creditors	5,000	Cash	2,000
Bank Overdraft	1,250		
	31,250		31,250

[Ans : (1) Current Ratio = 2.44:1; (2) Liquid Ratio = 1.04 :1; (3) Fixed Asset Net Worth Ratio = 80%; (4) Debt-Equity Ratio = 25 :1; (5) Operating Ratio = 0.74 :1; (6) Stock Turnover Ratio = 7.1 3times; (7) Fixed Asset Turnover Ratio = 3.06 times; (or) 3.1 times; (8) Creditors' Turnover Ratio = 6 times; (9) Gross Profit Turnover Ratio = 44.39%; (10) Net Profit to Sales = 25.71 %; (11) Return on Investment Ratio = 52%; (12) Proprietary Ratio = 0.64].

(6) Ranjit Ltd. provides the following information for the year ending 31st March 2003 and request you to ascertain (a) Operating Ratio (b) Operating Profit Ratio and (c) Operating Profit :

	Rs.
Sales	1,00,000
Gross Profit	4,00,000
Office Expenses	30,000
Selling Expenses	20,000
Administrative Expenses	15,000
Loss on Sale of Plant	2,000
Interest received on investments	2,500
Net Profit	3,35,000

[Ans : Operating Ratio = 65% (b) Operating Profit Ratio = 35% (c) Operating Profit = Rs. 3,35,000].

- (7) From the following information find out (a) Sales (b) Closing Stock (c) Sundry Debtors and (d) Sundry Creditors
- Gross Profit Ratio 25%
- Debtors' Turnover Ratio 2 months
- Stock Turnover Ratio 2 times
- Creditors' Turnover Ratio 3 months
- Closing stock is Rs. 10,000 more than the opening stock. Bills receivable amount to Rs. 30,000 and Bills payable to Rs. 40,000. Cost of goods sold for the year is Rs. 6,00,000
- [Ans : (a) Sales = Rs. 8,00,000; (b) Closing Stock Rs. 3,05,000; (d) Sundry Debtors Rs. 93,333; (d) Sundry Creditors Rs. 71,666].

- (8) Calculate the average collection period from the following details by adopting 360 days to an year.

Average Inventory	Rs. 3,60,000
Debtors	Rs. 2,30,000
Inventory Turnover Ratio = 6	
Gross Profit Ratio 10 %	
Credit Sales to Total Sales 20 %	

[Ans : Average Collection Period = 172.5 days].

- (9) You are required to calculate Return on Investment from the following details of Mary Ltd. for the year ending 31st March 2003.

Net Profit after tax	Rs.	3,25,000
Rate of Income tax		50 %
12.5% Debenture of 100 each	Rs.	4,00,000
Fixed Assets	Rs.	12,30,000
Depreciation	Rs.	2,30,000
Current Assets	Rs.	7,50,000
Current Liabilities	Rs.	3,50,000

[Ans : Return on Investment = 50 %].

- (10) The following balance sheet is given to you :

	Rs.		Rs.
Preference Share Capital	1,00,000	Fixed Assets	2,00,000
Reserve for Contingencies	20,000	Sundry Debtors	30,000
Term Loans	80,000	Inventories	30,000
Sundry Creditors	50,000	Bills Receivable	10,000
Profit & Loss A/c	30,000	Cash at Bank	30,000
Provision for Taxation	20,000		
	3,00,000		3,00,000

You are required to calculate :

(a) Acid Test Ratio (b) Debit Equity Ratio and (c) Current Ratio.

- (11) From the following particulars, you are required to calculate (a) Current Ratio (b) Gross Profit Ratio (c) Stock Turnover Ratio (d) Debt Equity Ratio (e) Proprietary Ratio (f) Debtor's Turnover Ratio

	Rs.		Rs.
Annual Sales	74,40,000	Paid up Capital	15,00,000
Gross Profit	7,44,000	Reserve & Surplus	6,00,000
Fixed Assets	16,50,000	7% Debentures	5,00,000
Inventories	9,10,000	Bank Overdraft	2,00,000
Sundry Debtors	12,40,000	Sundry Creditors	12,00,000
Short-Term Investments	1,60,000		
Cash Balances	40,000		

- (12) Calculate the current assets of a company from the following information:

- (1) Stock turnover : 5 times
- (2) Stock at the end is Rs. 5,000 more than stock in the beginning
- (3) Sales (all credit) : Rs. 2,00,000
- (4) Gross Profit Ratio : 20%
- (5) Current liabilities = Rs. 60,000
- (6) Quick Ratio 0.75

[Ans: Current Assets Rs. 79,500]

- (13) From the following details prepare statement of proprietary funds with as many details as possible :

- (1) Stock Velocity – 6
- (2) Capital turnover ratio – 2
- (3) Fixed asset turnover ratio – 4
- (4) Gross Profit turnover ratio – 20%
- (5) Debtor's Velocity – 2 months
- (6) Creditor's Velocity – 73 days

The Gross Profit was Rs. 60,000. Reserve and Surplus amounted to Rs. 20,000. Closing Stock was Rs. 5,000 in excess opening stock.

[Ans : Proprietary Fund Rs. 1,20,000]

(14) A company has an inventory of Rs. 7,20,000, debtors Rs. 4,30,000 and an inventory turnover ratio of 12. The gross profit margin is 10% and its credit sales are 20% of the total sales. Calculate the average collection period.

[Ans: 81 days]

(15) From the following Balance Sheet and other information, you are required to calculate the following ratios : (a) Gross Profit Ratio (b) Operating Profit Ratio (c) Current Ratio and (d) Liquidity Ratio

Balance Sheet

<i>Liabilities</i>	<i>Rs.</i>	<i>Assets</i>	<i>Rs.</i>
Equity Share Capital	2,00,000	Land & Buildings	2,00,000
Preference Share Capital	80,000	Plant & Machinery	40,400
General Reserves	4,800	Inventories	78,400
Profit & Loss A/c	67,200	Sundry Debtors	36,000
Bank Overdraft	2,800	Bank	10,000
Sundry Creditors	12,000	Cash Balances	2,000
	3,66,800		3,66,800

[Ans : Gross Profit Ratio – 39.96%

Operating Ratio – 17.38%

Current Ratio – 8.54%

Liquidity Ratio – 3.24%]

(16) From the following information, calculate the following ratios: (a) Debt Equity Ratio (b) Interest Coverage Ratio (c) Debt to Total Fund Ratio (d) Return on Investment Ratio and (e) Capital Turnover Ratio

	<i>Rs.</i>
Share Capital	3,20,000
General Reserve	1,20,000
Profit and Loss A/c	2,00,000
Loan @ 15% interest	4,00,000
Sales for the year	11,20,000
Tax Paid during the year	80,000
Profit for the year after interest and tax	1,60,000

[Ans: Debt Equity Ratio 1:16; Interest Coverage Ratio – 5 times; Debt to total Fund Ratio 1:2.6; Return on Investment – 28.84%; Capital Turnover Ratio 1.08 times]

(17) From the following particulars, you are required to find out (a) Current Assets and (b) Stock :

- (1) Current Ratio – 2.5
- (2) Quick Ratio – 1.5
- (3) Working Capital Rs. 75,000
- (4) Bank Overdraft Rs. 25,000
- (5) Cash in hand Rs. 1,000

[Ans: Current Assets 1,25,000; Stock Rs.50,000]

The following information relates to Gupta & Co. Ltd. for the year ended 31st December 2003 :

<i>Dr.</i>	<i>Trading and Profit and Loss A/c</i>		<i>Cr.</i>
<i>Particulars</i>	<i>Amount Rs.</i>	<i>Particulars</i>	<i>Amount Rs.</i>
To Opening Stock	1,50,000	By Sales	10,40,000
To Purchases	6,50,000	Less: Returns	40,000
To Gross Profit c/d	4,00,000	By Closing Stock	2,00,000
	12,00,000		12,00,000
		By Gross Profit b/d	4,00,000

To Operating Expenses:			By Non-Trading Income:		
Administration	80,000		Dividend	18,000	
Selling & Distribution	50,000	1,30,000	Profit on Sale of Shares	22,000	40,000
To Non-Operating Exp.					
Loss on Sale of Assets		10,000			
To Net Profit		3,00,000			
		4,40,000			4,40,000

Balance Sheet

Liabilities	Amount Rs.	Assets	Amount Rs.
Share Capital	4,00,000	Land and Building	3,00,000
Reserves	1,80,000	Plant and Machinery	1,60,000
Current Liabilities	3,00,000	Stock	3,20,000
Profit and Loss A/c	1,20,000	Sundry Debtors	1,60,000
		Cash at Bank	60,000
	10,00,000		10,00,000

Calculate:

- (a) Gross Profit Ratio (b) Operating Profit Ratio (c) Expenses Ratio
(d) Return on Total Resources (e) Turnover to Total Assets (f) Operating Ratio
(g) Net Profit Ratio (h) Stock Turnover Ratio (i) Turnover of Fixed Assets

- [Ans: (a) Gross Profit Ratio 40%
(b) Operating Profit Ratio 27%
(c) Expenses Ratio :
 (I) Administrative Expenses Ratio 8%
 (II) Selling & Distribution Expenses Ratio 5%
(d) Return on Total Resources 30%
(e) Turnover to Total Assets 1 time
(f) Operating Ratio 73%
(g) Net Profit Ratio 30%
(h) Stock Turnover Ratio 3.43 times
(i) Turnover of fixed Assets 1.30 times.]

- (18) The Capital of Patel & Co. Ltd. is as follows:

	Rs.
9% Preference Shares of 10 each	3,00,000
Equity Shares of Rs. 10 each	8,00,000
	11,00,000

Additional Information

Profit (after tax at 60%) Rs. 2,70,000; Depreciation Rs. 60,000;
Equity dividend paid 20%; Market Price of Equity Shares Rs. 40. You are required to calculate the following:

- (a) Dividend yield on the Equity Shares
(b) Cover for the Preference and Equity Dividends
(c) Earnings for Equity Shares
(d) Price-Earnings Ratio

- [Ans: (a) 5% (b) Preference 10 times, Equity 1.52 times (c) Rs. 3.04 per Share
(d) 13.2 times.]