1

CAPITAL BUDGETING

Unit Structure :

1.0 Objective

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1.5 Discounted Cash Flow Technique

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1.0 OBJECTIVES

- To Introduce the topic.
- To Understand the meaning and importance of Capital Budgeting.
- To Explain the techniques of capital budgeting.
- To Explain the Merits and Demerits of the techniques.
- To Know the calculation procedure of the techniques.
- To Illustrate the Evaluating techniques namely NPV and Payback Method.

1.1 INTRODUCTION

Budget is the term especially used in the Government department Budget means to plan for future. During the early years Budgetary Control has become a very popular technique of cost control. Now a day it exists in almost all the organization in various forms. Capital Budget is one of the forms.

1.2 MEANING

The final Objective of each organization is to earn more and more profit. Thatswhy to plan and control the capital expenditure to achieve the profit goal is the vital part of every business unit. The capital expenditures mean the expenditures incurred on acquiring or for extension of the long-term

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asset. Capital Asset or a Long-term asset may be a new building, a new machinery or a new project. Capital Budget relates to the investment in capital expenditures. Capital expenditure decisions include current outlays but are beneficial over a period of time longer than one year. The term capital budget is used interchangeable with Capital Expenditure Decision, Long Term Investments Decision. Capital Budget means long term investment decisions and management of fixed assets. Capital Budget is the decision whether or not the money should be invested in long term project. Capital Budgeting involves the preparation of cost and revenue estimates for all the possible projects, an examination of the merits and demerits of each and every possibility and finally selection of the project giving the highest return on investment. The Capital Budget includes the planning and utilization of available capital to increase the profitability of the business organization.

The Capital expenditure decisions are of two types:

1. **Investment Decisions which increases Revenues:** It means here the decision have been taken for adding New Capital Assets or New Plant or Introducing New Product Line which increase the production and finally brings additional revenue.

2. **Investment Decisions which reduces Cost:** Here the decisions have been taken for Replacement of Old Asset or Old Plant with New One, which reduces cost.

Importance of Capital Budgeting:

According to Joe Dean, "Today's capital expenditure makes the bed that company must lie in tomorrow. The capital expenditure budget embraces a company's plans for replacing, improving and adding to its capital equipment." These words show that capital budgeting is a vital function of management. Capital Budgeting is very important for survival and growth of the organization as it is related to the decisions of long-term investment.

Following points explain the importance of capital budgeting:-

1) For Careful Investment Decisions :-

As the capital investment is a long term investment therefore if once the decision has been taken it becomes very difficult to reverse from it. Even any modification or alternations are also become impossible.

Capital budgeting helps in taking careful capital expenditure decisions.

2) To avoid over and under investment :-

Capital budgeting includes the decisions about Acquisition of assets and an estimation of earnings during the life time of such assets. An incorrect decision in this matter leads to over or under investment. Both the situations are risky from the profitability point of view. Hence proper planning of capital expenditure is essential.

3) To avoid unessential blocking :-

Ensure the proper timing of assets acquisition, is the main feature of Capital budgeting. If the assets are not acquired on proper time, it is the unessential blocking of funds. It results into loss of revenue.

4) To arrange for the necessary finance in time :-

Capital budgeting means the Estimation of capital investment decisions. Therefore it enables the organization to arrange for the necessary funds in time for long term investment.

5) To look into the various aspects and alternatives :-

Deep study of various proposals and their various aspects is a vital stage in the process of capital budgeting. It ensures that the investment will be made in the most profitable proposal. It increases the productivity of the concern and finally the overall economy of the country.

6) To investigate and evaluate the technological changes :-

For facing cut throat competition investigation of technological changes is needful. To investigate and evaluate the technological changes is the important function of capital budgeting. Thorough investigation, evaluation and application of advanced techniques decreases the cost of production and increases the probability which enables the business ready for facing the cut throat computation.

1.3 EVALUATION TECHNIQUES

The technique used in capital budgeting for the appraisal or reappraisal of an investment proposal is termed as Evaluation Technique. While taking long term investment decisions the comparison among the various investment proposals is needful. After comparison and evaluation of all the proposals one proposal should be selected for investment which gives the best results.

Types of Evaluation Techniques

Traditional Techniques Techniques	**Time Adjusted/Discounted Cash Flow**
1) Average Rate of Return	1) Net Present Value Method
2) Payback Period Method	2) Internal Rate of Return Method
	3) Profitability Index

The main Techniques are discussed below :-

1.4 PAY BACK PERIOD TECHNIQUE

it is the traditional technique of Capital Budgeting. Here the period is calculated within which the cost of the project will be completely recovered. Such period is termed as Pay Back Period.

Advantages:

1) This method is easy to calculate

2) It is simple to understand

3) Here investment recovery period is calculated therefore business unit can know about the period within which the funds will remain tied up.

4) The project having short pay- back period are accepted here this method is more suitable to the industries where risk of obsolescence is high.

Disadvantages:

1) This method completely ignores all cash inflows after the pay- back period. This can be very misleading as it does not consider the total benefits occurring from the project.

2) It ignores the time value of money. In this method money received now and receivable in future are considered as of equal value.

3) This method does not take into consideration the entire life of the project. As a result, project with large cash inflows in the latter part of payback period and less cash inflows in the earlier years may be rejected.

4) This method ignores residual value. in spite of these limitations the industries having high risk of obsolescence prefer this method. Like wise where, quick return to recover the investment is the primary goal this method is preferred.

The terms used in this method:

- Cash outflows: It means the original cost of proposal or investment
- Cash inflows: It means the profits before depreciation but after tax.

Procedure:

1) If the cash inflows are uniform:

$$\textbf{Pay Back Period} = \frac{\textbf{Cash Outflow}}{\textbf{Cash Inflow}}$$

For e.g. An investment of Rs. 32,000 in a machine is expected to yield Rs. 8,000 for a period of 10 years, here the

Pay Back Period = $\frac{32000}{8000}$

= 4 years

2) If the cash inflows are not uniform:

A) Prepare the column for cumulative cash inflows

B) Here the pay back period is the time when the cumulative cash inflows become equal to the original cost of proposal.

For e.g.

When an investment of Rs. 70,000 in a machine is expected to yield earnings of Rs. 6,000, Rs. 12,000, Rs. 17,000, Rs. 20,000, Rs. 20,000 and Rs. 25,000 in 6 years are estimated calculate the pay back period.

Solution:

YEAR	Annual earnings Rs.	Cumulative earnings Rs.
1	6,000	6,000
2	12,000	18,000
3	17,000	35,000
4	20,000	55,000
5	20,000	75,000
6	25,000	1,00,000

Here, the Cash Out flow = Rs. 70,000

Pay Back Period lies between the 4th and the 5th year

Pay Back Period = 4 years + Part of the 5th year to cover the cost of the Machine Rs. 70,000 which is calculated as below

Pay Back Period =

$$= 4 \text{ Years} + \frac{\text{(Cash Outflows – Cumulative earnings of the 4th year)}}{\text{Annual earnings of 5th year}}$$

$$= 4 \text{ years} + \frac{(70,000 - 55,000)}{20,000}$$

$$= 4 \text{ years and } \frac{15,000}{20,000}$$

= 4years and ¾ months

Pay Back Period = 4 Years and 9 months

Accept or reject criterion :-

The project having lower pay back period will be accepted.

1.5 DISCOUNTED CASH FLOW TECHNIQUE

This technique takes into consideration the time value of money while evaluating the project. The meaning of Time Value of money is that the sum received today is worth more than the same to be received tomorrow.

For e.g. if Rs.1,000/- are invested at @ 15% Rs 1,150 will be received after a year It means Rs.1,150/- to be received in the next year has a present value of Rs. 150/- represents the time value of money.

The main features of this technique are:

1) This technique takes into consideration the time value of the money.
2) Here all the benefits and costs occurring during the entire life of the project are taken into account.
3) Here the cash in flows are discounted at certain rate.
4) The Discounted Cash Flow Technique is sub divided as:

- Net Present Value method
- Internal Rate of Return Method
- Profitability Index

1.6 PROFITABILITY INDEX / BENEFIT COST RATIO

It represents a ration of the present value of future cost benefit at the required rate of return to the initial cash outflow of the investment. It is similar to the Net Present Value approach.

Merits:

1) This method is helpful in comparing the project having different amounts of investment therefore it is superior to Net Present Value method.
2) It considers the time value of money.
3) It considers all cash inflows.

Demerits:

1) It is difficult to understand and to calculate.
2) In case of mutually exclusive nature investment the Present Value Method is superior than of this method.

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Procedure:

1) Calculate Cash Out Flows and its present value.

2) Calculate the present value of Cash Inflows.

3) Calculate the ratio of present value of cash in flows to the present value of cash outflows. This ratio is called as profitability index.

Formula -

$$\frac{\text{Sum of Present Value of Cash Inflows /Discounted Cash Inflows}}{\text{Present Value of Cash Outflows/ Discounted Cash Outflows}}$$

Accept / Reject:

The selection of project has based on ranking i.e. the project with the highest Profitability Index is given the first rank followed by others.

1.7 INTERNAL RATE OF RETURN METHOD

It is also a Discounted Cash Flow Technique. It is also known as Yield on Investment Technique, Marginal Efficiency of Capital, Marginal Productivity of capital, Time Adjusted Rate of Return. Here the discounted rate of return is calculated by picking up the estimated rates. This process is continued up to the time one can get the estimated rate which equalize the cash inflows and out flows. This Discounted Rate is known as Internal Rate of Return. It means the Internal Rate of Return is the interest rate at which present values of cash inflows and cash out flows are equal. The internal rate of return is usually the rate of return that a project earns. It is defined as, "The Discounted Rate which equates the aggregate present value of the net cash inflows with the aggregate present value of cash out flows." In other words, it is the rate which gives the project Net Present Value ZERO.

Merits:

1) It considers the Time Value of money.

2) It takes into account the total cash inflows and out flows.

3) It does not use the required rate of return or the cost of capital. Therefore, calculations for cost of capital are not necessary. It provides a separate rate of return which indicates the profitability of the proposal.

Demerits:

1. This method is difficult to understand and to calculate.

2. It is based on future earnings as the estimates of future earnings cannot be made correctly.

3. It provides the multiple rates which can be confusing.

Accept / Reject criterion:

While taking the decision for accept or reject of the project the Internal Rate of Return is compared with the Required Rate of Return. If the Internal Rate of Return exceeds the required rate the project would be accepted.

1.8 PROBLEMS AND SOLUTIONS

1.8.1 The initial outlay of the project is Rs. 50,000 and it generates cash inflows of Rs. 25,000, Rs. 20,000, Rs. 15,000 and Rs. 10,000 in the four years of its lifespan. Your are required to calculate the Net Present Value of the project assuming 10% rate of discount. The present value of Re. 1 at 10% discount rate is as follows:

Year:	1st	2nd	3rd	4th
Present Value:	0.909	0.826	0.751	0.683

You are required to calculate the Net Present Value of the project.

SOLUTION:

Year	Cash Inflows Rs.	Discounted Factor At 10%	Present Value Rs.
1	25,000	0.909	22,725
2	20,000	0.826	16,520
3	15,000	0.751	11,265
4	10,000	0.683	6,830
			57,340
		Less: Cash outflows	50,000
		Net Present Value	**7,340**

1.8.2 Given below is the information regarding two machines A and B each costing Rs. 1,00,000. In comparing the profitability of the machines, a discount rate of 9% is to be used. Earnings after taxation are expected to be as follows:

Cash Inflows

YEAR	Machine A	Machine B
1	30,000	10,000
2	40,000	30,000
3	50,000	40,000
4	30,000	60,000
5	20,000	40,000

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Indicate which machine would be more profitable investment under the :

1) Pay Back Period Method

2) Net Present Value Method

3) Calculate the Pay Back Profitability

The Present Value of Rs. 1 at 9% discount rate is as follows:

YEAR:	1st	2nd	3rd	4th	5th
PRESENT VALUE:	0.92	0.84	0.77	0.71	0.65

SOLUTION:

Pay Back Period Method :

Year	**Machine A**		**Machine B**	
	Cash Inflows Rs.	Cumulative Cash Inflows Rs.	Cash Inflows Rs.	Cumulative Cash Inflows Rs.
1	30,000	30,000	10,000	10,000
2	40,000	70,000	30,000	40,000
3	50,000	1,20,000	40,000	80,000
4	30,000	1,50,000	60,000	1,40,000
5	20,000	1,70,000	40,000	1,80,000

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Pay Back Period of Machine A:

Cash Outflow/ cost of Machine A = Rs. 1,00,000

i.e. The Pay Back Period lies between 2nd and 3rd year

Pay Back Period = 2 Years and $\frac{1,00,000 - 70,000}{50,000}$

Pay Back Period = 2 Years and $\frac{30,000}{50,000}$

Pay Back Period of Machine A = 2 and 3/5 Years i.e. 2.6 Years.

Pay Back Period of Machine B

Cash Outflow / cost of Machine B = 1,00,000

i.e. The Pay Back Period of Machine B lies between 3rd and 4th year

Pay Back Period = 3 Years and $\frac{1,00,000 - 80,000}{60,000}$

= 3 Years and $\frac{20,000}{60,000}$

Pay Back Period of Machine B = 3 and 1/3 Years i.e. 3 Years and 4 months

As the Pay Back Period of Machine A is less than of Machine B therefore the investment in Machine A is more profitable as per the Pay Back Period Method.

Pay Back Profitability

Particulars	**Machine A**	**Mahcine B**
Total Cash Inflows	1,70,000	1,80,000
Less: Total Cash Outflows / Cost of the Machine	1,00,000	1,00,000
Pay Back Profitability	70,000	80,000

Net Present Value Method :

Profitability statement (at 9% Discount Factor)

YEAR	Present Value Factor at 9% Discount	Machine A		Machine B	
		Cash inflow Rs.	Present value Rs.	Cash inflow Rs.	Present Value Rs.
1	0.92	30,000	27,600	10,000	9,200
2	0.84	40,000	33,600	30,000	25,200
3	0.77	50,000	38,500	40,000	30,800
4	0.71	30,000	21,300	60,000	42,600
5	0.65	20,000	13,000	40,000	26,000
			1,34,000		1,33,800
		Less :Cash outflow	1,00,000	*Less:* Cash outflow	1,00,000
		Net Present Value	**34,000**	Net Present Value	**33,800**

As per the Net Present Value Method the investment in Machine A is profitable as its Net Present Value is more than Machine B.

1.8.3 A limited company considering to purchase a new machine which will carry out some operations performed by labour. X and Y are alternative models. From the following information, you are required to prepare a profitability statement and work out the Pay Back Period in respect of each assets:

Particulars	**Machine X**	**Machine Y**
Estimated life of machine (years)	5	5
	Rs	Rs.
Cost of machine	15,000	25,000
Cost of indirect materials	3,000	4,000
Estimated savings in scrap	5,000	7,500
Additional cost of maintenance	9,500	13,500
Estimated savings in direct wages:		
Employees not required	75	100
Wages per employee	300	300

Taxation is to be regarded as 50% of profit (ignore depreciation for calculation of tax).

SOLUTION:

Calculation of annual Cash Inflows

Particulars	**Machine X**		**Machine Y**	
Saving per annum:				
Labour	300x75	22,500	300x100	30,000
Scrap		5,000		7,500
TOTAL SAVINGS		27,500		37,500
Less: Additional cost per annum	3,000		4,000	
Indirect Material	9,500	12,500	13,500	17,500
Maintenance		15,000		20,000
Profit before Tax and Depreciation		7,500		10,000
Tax @ 50%	15,000/5	3,000	25,000/5	5,000
Depreciation		**4,500**		**5,000**
		7,500		**10,000**
Net increase in Savings			5,000	
ANNUAL CASH INFLOWS =	4,500		5,000	
Net increase in savings +Depreciation	3,000			

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$$\text{PAY BACK PERIOD} = \frac{\text{Cost of Machine}}{\text{Annual Cash Inflows}}$$

Pay Back Period of Machine X $= \frac{15,000}{7,500}$

$= 2$ years

Pay Back Period of Machine Y $= \frac{25,000}{10,000}$

$= 25$ yesrs

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2

WORKING CAPITAL

Unit Structure:

2.0 Objective

2.1 Introduction

2.2 Importance of Working Capital:

2.3 Components of Working Capital:

2.4 Operating Cycle

2.5 Classification of Working Capital

2.6 Factors Affeting Working Capital

2.7 Management of Working Capital

2.8 Strategies in Working Capital Management

2.9 Working Capital Policies

2.10 Working Capital Ratios

2.11 Working Capital Leverage

2.12 Estimation of Working Capital

2.13 Steps in Determination of Working Capital

2.0 OBJECTIVE

The basic objectives of working capital management are as follows:

- By optimizing the investment in current assets and by reducing the level of current liabilities the company can reduce the locking up of funds in working capital thereby, its fan improves the return on capital employed in the business.
- The second important objective of working capital management is that the company should always be a position to meet its current obligations which should properly be supported by the current assets available with the firm. But maintaining excess funds in working capital means locking of funds without return.
- The firm should manage its current assets in such away that the marginal return on investment in these assets is not less than the cost of capital employed to finance the current assets.

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- The firm should maintain proper balance between current assets and current liabilities to enable the firm to meet its day to day financial obligations.

2.1 INTODUCTION

Working capital can be defined as the difference between the current assets and liabilities.

The difference received after deducting the current liabilities from the current assets is known as the net working capital of the business. Working Capital is the measure of a venture's liquidity. It also denotes the operational efficiency of a venture. The better the working capital, the better is the business' short-term financial health.

2.2 IMPORTANCES OF WORKING CAPITAL

Working capital management is a significant in Financial Management due to the fact that it plays a pivotal role in keeping the wheels of a business enterprise running. Working Capital Management is concerned with short term financial decisions. Shortage of funds for working capital has caused many business to fail and in many cases, has retarded their growth Lack of efficient and effective utilization of working capital leads to earn low rate of return o capital employed or even compels to sustain losses. The need for skilled working capital management has thus become greater in recent years. A firm invests a part of its permanent capital in fixed assets and keeps a part of it for working capital i.e. for meeting the day to day requirements. We will hardly find a firm which does not require any amount of working capital for its normal operations. The requirement of working capital varies from firm to firm depending upon the nature of business, production policy market conditions seasonality of operations, conditions of supply et. Working capital to a company is like the blood to human body. It is the most vital ingredient of a business. Working capital management if carried out effectively, efficiently and consistently will ensure the health of an organization. A company invests its funds for log term purposes and for short-term operations. That portion of a company's capital, invested in a short term or current assets to carry on its day to day operations smoothly is called the "*working capital"*. Working capital refers to a firm's investment in short term assets viz. cash, short term securities amounts receivables and inventories of raw materials work in progress and finished goods. It refers to all aspects of current assets and current liabilities. The management of working capital is no less important than the management of long-term financial investment. Sufficient liquidity is necessary and must be achieved and maintained to provide that funds to pay off obligation as they arise or mature. The adequacy of ash and other current assets together with their efficient handling virtually determine the survival of the company. The efficient working capital management is necessary to maintain a balance of liquidity and profitability If the funds are tied up in idle current assets represent proper and in efficient working capital management which affects the firm's liquidity as sell as profitability.

Working capital is defined as "the excess of current assets over current liabilities". All elements of working capital are quick moving in nature and therefore require constant monitoring for proper management. For proper management of working capital, it is required that a proper assessment of its requirement is made. Working capital is also known as circulating capital, fluctuating capital and revolving capital. The magnitude and composition keep on changing continuously in the course of business. If the working capital level is not properly maintained and managed then it may result in unnecessary blockage of scarce resources of the company. Therefore, the Finance Managers should give utmost care in management of working capital.

Working capital at the beginning	**
Source of Funds:	
- Funds generated from Operations issue of Shares and debentures	**
- Raising of term loans	**
- Sale of fixed assets	**
- Sale of investments	**
- Non operating income etc.	**
Application of Funds:	
- Loss from operations	**
- dividend paid	**
- taxes paid	**
- purchase of fixed assets	**
- repayment of term loans	**
- redemption of preference shares debentures etc.	**
- Increase /decrease in Working capital	**
Working capital at the end	**

FLOW OF FUNDS AND WORKING CAPITAL CHANGES

2.3 COMPONENTS OF WORKING CAPITAL:

- **Current Assets:** Current assets are those asserts which are convertible into cash within a period of one year and are those which re required to meet the day to day operations of the business. The working capital management, to be more precise is the management of current assts. The current assets are cash or near cash resources. They are:

  (a) Cash and Bank balances

  (b) Temporary investments

  (c) Short term advances

  (d) Prepaid expenses

  (e) Receivables

  (f) Inventory of raw materials stores and spares

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(g) Inventory of work-in-progress

(h) Inventory of finished goods

- **Current Liabilities:** Current liabilities are those claims of outsiders which are expected to mature for payment within an accounting year these include:

(a) Creditors for goods purchased

(b) Outstanding expenses

(c) Short term borrowings

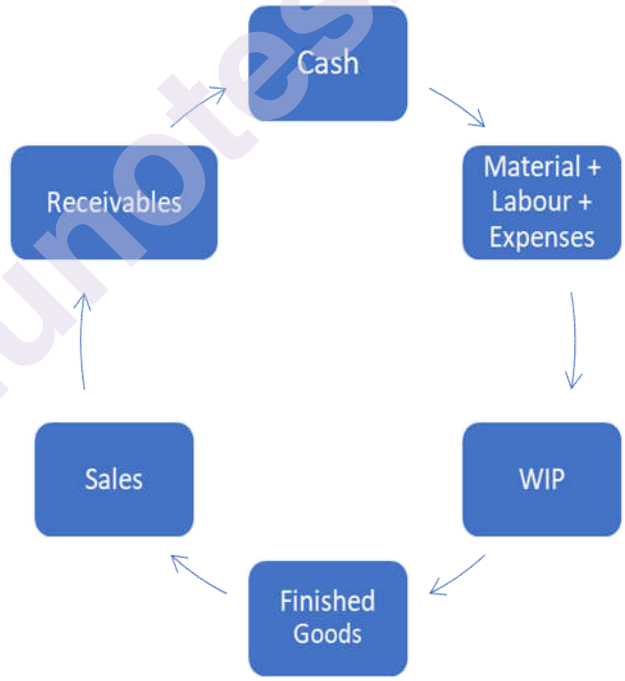
(d) Advances received against sales

(e) Taxes and dividends payable

(f) Other liabilities maturing within a year

2.4 OPERATING CYCLE

CASH CYCLE



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2.5 CLASSIFICATION OF WORKING CAPITAL

2.5.1 GROSS AND NET WORKING CAPITAL:

Generally the working capital has its significance in two perspectives. These are gross working capital and net working capital are called Balance sheet approach" of working capital.

2.5.1.1 Gross Working Capital:

The terms gross working capital refers to the firm's investment in current assets. According to this concept working capital refers to a firm's investment in current assets. The amount or current liabilities is not deducted from the total of current assets. The concept of gross working capital is advocated for the following reasons

- Profits of the firm are earned by making investment of its funds in fixed and current assets. This suggests the part of the earning relate to investment in current assets. Therefore, aggregate of current assets should be taken to mean the working capital.
- The management is more concerned with the total current assets as they constitute the total funds available for operating purposes than with the sources from which the founds come.
- An increase in the overall investment in the enterprise also brings in increase in the working capital.

2.5.1.2 Net Working Capital:

The term net working capital refers to the excess of current assets over current liabilities. It refers to the difference between current assets and current liabilities. The net working capital is a qualitative concept which indicates the liquidity position of a firm and the extent to which working capital needs may be financed by permanent source of funds. The concept looks into the angle of judicious mix of long term and short-term funds for financing current assets. A portion of et working Capital should be financed with permanent sources of funds. the gross and net working Capital are ascertained as shown below "

Current assets	
Raw material stock	xxx
Work in process stock	xxx
Finished goods stock	xxx
Sundry debtors	xxx
Bills receivable	xxx
Short term investments	xxx
Cash and bank balances	xxx
Gross Working capital (Total Current Assets)	**xxx**
Less: Current liabilities	
Creditors for materials	xxx

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Creditors for expenses	xxx
Bills payable	xxx
Tax liability	xxx
Short term loans	xxx
Net working capital	**xxx**

2.5.2 PERMANENT AND VARIABLE WORKING CAPITAL

Considering time as the basis of classification, there are two types of working capital viz. Permanent and temporary"

The management of working capital is concerned with maximum the return to share holders within the accepted risk constraints carried by the participants in the company. Just as excessive long-term debt puts a company at risk, so an inordinate quantity of short-term debt also increases the risk to a company by straining its solvency. The suppliers of permanent working capital look for long term return on funds invested whereas the suppliers of temporary working capital will look for immediate return and the cost of such financing will also be costlier than the cost of permanent funds used for working capital.

2.5.2.1 Permanent Working Capital:

The magnitude of investment in working capital may increase or decrease over a period of time according to the level of production. But, there is a need for minimum level of working capital to carry its business irrespective of change in level of production. Such minimum level of working capital is called permanent working capital or fixed working capital. It is the irreducible minimum amount necessary for maintaining the circulation of current assets. The minimum level of investment in current assets is permanently locked up in business and it is also referred to as regular working capital. It represents the assets required on continuing basis over the entire year. The permanent component current assets which are required throughout the year will, generally, be financed from long term debt and equity. Tandon committee has referred to this type of working capital as core curre3nt assets, Core current assets are those required by the firm to e4nsure the continuity of operations which represents the minimum level of various items or current assets viz. Stock of raw materials stock of work in process stock of finished goods debtors' balances ash and bank etc. This minimum level of current assets will be financed by the long-term sources and any fluctuations over the minimum level of curr3ent assets will be financed by the short-term financing.

2.5.2.2 Variable Working Capital:

It is also known as "fluctuating working capital". It depends upon the changes in production and sales, over and above the permanent working capital. It is the extra working capital needed to support the changing business activities. It represents additional assets required at different items during the operation of the year. A firm will finance its seasonal and current fluctuations in business operations through short term debt financing. For example, in peak seasons, more raw materials to be purchased more manufacturing expenses to be incurred, more funds will be locked in debtors balances etc. In such times excess requirement of working capital would be financed from short term financing sources

2.5.3 POSITIVE AND NEGATIVE WORKING CAPITAL:

The net working capital of a firm may be positive or negative "

- The positive net working capital represents the excess of current assets over current liabilities.
- Sometimes the net working capital turn to be negative when current liabilities are exceeding the current assets. The negative working capital position will adversely affect the operations of the firm and its profitability. The chronic negative working capital situation will lead to closure of business and the enterprise is said to be technically insolvent.

Disadvantages of Negative Working Capital: The disadvantages suffered by a company with negative working capital are as follows:

- The company is unable to take advantage of new opportunities or adopt to changes
- Fixed assets cannot be used effectively in situation of working capital shortage
- The operating pans cannot be achieved and will reduce the profitability of the firm.
- It will stagnate the growth of the firm.
- Employee morale will be lowered due to financial difficulties
- The operating inefficiencies will creep into daily activities
- Trade discounts are lost. A company with ample working capital is able to finance large stocks and can, therefore, place large orders.
- Cash discounts are lost. Some companies will try to persuade their debtors to pay early by offering them a cash discount, off the price owed.
- The advantage of being able to offer a credit line to customers are foregone.
- Financial reputation is lost result in non cooperation from trade creditors in times of difficulty.

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- There may be concerned action by creditors and will apply to court for winding up.
- It would be difficult to get adequate working capital finance from banks, financial institutions.

2.6 FACTORS AFFETING WORKING CAPITAL

Factors Determining Working Capital Requirement:

There is no set of universally applicable rules to ascertain working capital needs of a business organisation. The factors which influence the need level are discussed below:

1. Nature of Business:

If we look at the balance sheet of any trading organisation, find major part of the resources are deployed on current assets, particularly stock-in-trade.

Whereas in case of a transport organization major part of funds would be locked up in fixed asserts like motor vehicles spares and work shed etc. and the working capital component would be negligible.

The service organizations will require lesser working capital than trading and financial organizations. Therefore, the requirement of working capital depends upon the nature of business carried by the organization.

Manufacturing Time span required for conversion of raw materials cycle to finished goods is a block period. The period in reality, extends a little before and after the WIP. This cycle determines the Need of working Capital. In case of industries with long manufacturing processor production cycle, more funds are required for working capital. The industries involved in quick conversion of raw materials into finished units or having lesser production cycle requires lesser amount of working capital.

In case of labour intensive Industries more working Process capital is needed, but in case of capital-intensive Industries the production process is faster and it requires lesser amount of working capital due to lesser conversion costs.

2. Business Cycle:

This is another factor which determines the need level. Barring exceptional cases, there are variations in the demand for goods/services handled by any organization. Economic boom or recession etc. have their influence on the transactions and consequently on the quantum of working capital required. More working capital is needed during peak or boom conditions. But in case of economic recession or low inflationary conditions, the company requires low or moderate working capital.

3. Seasonal Variations:

Variation apart seasonality factor creates production and even storage problem. Mustard and many other oil seeds are Rabbi Crops. These are to be purchased in a season to ensure continuous operation of oil plant. Further there are woolen garments which have demand during winter only. But manufacturing operation has to be conducted during the whole year resulting in working capital blockage during off season.

4. Scale of Operations:

Operational level determines working capital demand during a given period. Higher the sale, higher will be the need for working capital. However, pace of sales turnover (quick or slow) is another factor. Quick turnover calls for lesser investment in inventory, while low turn over rate necessitates larger investment.

5. Inventory Policy:

The traditional production systems generate more stocks of finished goods and high levels of raw materials and WIP stocks are maintained and the stock holding period is also more. In such cases more working capital is needed. The adoption of JIT supply chain management, vendor management will drastically reduce the levels of raw materials, WIP and finished goods stocks and therefore less amount of funds are invested in inventory.

6. Credit Policy:

Credit policy of the business organization includes to whom, when and to what extent credit may be allowed. Amount of money locked up in account receivables has its impact on working capital. The liberal credit period and follow up proceedings will increase the investment in debtors balances and simultaneously increased the working capital requirement than concerns resorting to strict credit and collection procedures

7. Accessibility to Credit

Credit worthiness is the precondition for assured accessibility to credit. Accessibility in banks depends on the flow of credit i.e. the level of working capital.

8. Business Standing:

In case of newly established concerns the materials are required to be purchased in cash and the sales are to be made on credit basis. Such new concerns require high levels of working capital. But the established companies can negotiate for credit terms with suppliers and sell the products at lesser credit period to customers. Therefore, it requires less working capital than concerns with lesser business standing.

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9. Growth of Business:

Growth and diversification of business call for larger amount of working capital. The need for increased working capital does not follow the growth of business operations but precedes it. Working capital need is in fact assessed in advance in reference to the business plan.

10. Market Conditions:

In a buyers market i.e. the market with fierce competition, the companies are forced to sell on credit with liberal credit and collection policies. This increases the level of investment on working capital due to increased debtors balances and its administration costs. But if the sellers market prevails the quick disposal of stocks, high percentage of cash sales, strict credit and collection policies etc. reduces the need for working capital.

11. Supply situations:

In easy and stable supply situation no contingency plan is necessary and precautionary steps in inventory investment can be avoided. But in case of supply uncertainties, lead time, may be longer necessitating larger basic inventory, higher carrying cost and working capital need for the purpose. Aggressive approach cannot be adopted in such situation.

12. Environment Factors:

Political stability brings in stability in money market and trading world Things mostly go smooth. Risk ventures are possible with enhanced need for working capital finance. Similarly, availability of local infrastructural facilities like road, transport, storage and market etc. influence business and working capital need as well.

2.7 MANAGEMENT OF WORKING CAPITAL

Symptoms of Poor Working Capital Management:

The following cases are seen in inefficient management of working capital.

- Excessive carriage of inventory ogerth4e normal levels required for the business will result in more balance in trade creditors accounts. More creditors balances will cause strain on the management in management of cash.
- Working capital problems will arise when there is a slow down in the collection of debtors.
- Sometimes capital goods will be purchased from the funds available for working capital. This will result in shortage of working capital and its impact is on operations of the company.
- Unplanned production schedules will cause excessive stocks of finished goods or failures in meeting dispatch schedules.

- More funds kept in the form of cash will not generate any profit for the business.
- Inefficiency in using pot3ntial trade credit require more funds for financing working capital.
- Overtrading will cause shortage of working capital and its ultimate effects on the operations of the company.
- Dependence on short term sources for financing permanent working capital cause lesser profitability and will increase strain on the management in managing working capital.
- Inefficiency in cash management cause embezzlement of cash.
- Inability to get working capital limits will cause serious concern to the company and sometimes may turnout to be sick.

2.8 STRATEGIES IN WORKING CAPITAL MANAGEMENT

So far, the banks were the sole source of funds for working capital needs of business sector. At present more finance options are available to a finance Manager to see the operations of his firm go smoothly. Depending on the risk exposure of business, the following strategies re evolved to manage the working capital.

2.8.1 Conservative Approach:

A conservative strategy suggests not to take any risk in working capital management and to carry high levels of current assets in relation to sales. Surplus current assets enable the firm to absorb sudden variations in sales, production plans and procurement time without disrupting production plans. It requires to maintain a high level of working capital and it should be financed by long term funds like share capital or long term debt. Availability of sufficient working capital will enable the smooth operational activities of the firm and there would be no stoppages of production for want of raw materials, consumables. Sufficient quantity of finished goods are maintained to met the market fluctuations. The higher liquidity levels reduce the risk of insolvency. But lower risk translates into lower return. Large investments in current assets lead to higher interest and carrying costs and encouragement for inefficiency. But lower risk translates into lower return. Large investments in current assets lead to higher interest and carrying costs and encouragement for inefficiency. But conservative oily will enable the firm to absurd day to day business risks. It assures continuous flow of operations and eliminates worry about recurring obligations. Under this strategy long term financing covers more than the total requirement for working capital. The excess cash is invested in short term marketable securities and in need, these securities are sold off in the market in meet the urgent requirements of working capital.

Financing Strategy

Long term funds = Fixed assets + Total permanent current assets + Part of temporary current assets.

Short-term funds = Part of temporary current assets.

2.8.2 Aggressive Approach:

Under this approach current assets are maintained just to meet the current liabilities without keeping any cushion for the variations in working capital needs. The core working capital is financed by long term sources of capital and seasonal variations are met through short term borrowings. Adoption of this strategy will minimize the investment in net working capital and ultimately it lowers the cost of fining working capital. The maintenance drawbacks of this strategy are that if necessitates frequent financing and also increases risk as the firm is vulnerable to sudden shocks. A conservative current asset financing strategy would go for more long-term finance which reduces the risk of uncertainty associated with frequent refinancing. The price of this strategy is higher financing costs since long term rates will normally exceed short term rates. But when aggressive strategy is adopted, sometimes the firm runs into mismatches and defaults. It is the cardinal principle of corporate finance that long terms assets should be financed by long term sources and short-term assets by a mix of long- and short-term sources.

Financing Strategy

Long term funds = Fixed assets + Part of permanent current assets

Short term funds = Part of permanent current assets + Total temporary current assets.

2.8.3 Matching Approach:

Under matching approach to financing working capital requirements of a firm, each asset in the balance sheet assets side would be offer with a financing instrument of the same approximate maturity. The basic objective of this method of financing is that the permanent component of current assets, and fixed assets would be met with long term funds and the short term or seasonal variations in current assets would be financed with short term debt. If the long term funds are used for short term needs of the firm, it can identify and take steps to correct the mismatch in financing. Efficient working capital management techniques are thus that impress the operating cycle. The length of the operating cycles is equal to the sum or the lengths of the inventory period and the receivables period. Just in time inventory management technique reduce carrying costs by slashing the time that goods are parked as inventories. To shorten the receivables period without necessarily reducing the credit period, corporate can offer trade discounts for prompt payment. This strategy is also called as "hedging approach".

Financing Strategy:

Long term funds = Fixed assets + Total permanent current assets

Short term funds = Total temporary current assets

2.8.4 Zero Working Capital Approach:

This is one of the latest trends in working capital management. The idea is to have zero working capital i.e. at all times the current assets shall equal the current liabilities. Excess investment in current assets is avoided and firm meets its current liabilities out of the matching current assets. As current ratio is1 and the quick ratio below l. there may be apprehensions about the liquidity, but if all current assets are performing and are accounted at their realisable values, these fears are misplaced. The firm saves opportunity cost on excess investments in current assets and as bank cash credit limits are linked to the inventory levels interest costs are also saved. There would be a self imposed financial discipline on the firm to manage their activities within their current liabilities are current assets ad there may not be a tendency to over borrow or divert funds. Zero working capital also ensure a smooth and uninterrupted working capital cycle and it would pressure the finance Managers to improve the quality of the current asses at all times, to keep them 100% realizable. There would also be a constant displacement in the current liabilities and the possibility of having over dues may diminish. The tendency to postpone current liability payments has to be curbed and working capital always maintained at zero. Zero working capital would call for a fine balancing act in Financial Management and the success in the Endeavour would get reflected in healthier bottom lines.

Financing Strategy:

Total Current Assets = Total current Liabilities

Or

Total current Assets – Total Current Liabilities = Zero

2.9 WORKING CAPITAL POLICIES:

The degree of current assets that a company employs for achieving a desired level of sales is manifested in working capital policy. In practice, the business concerns follow three forms of working Capital policies which are discussed in brief as follows:

1. Restricted Policy:

It involves the rigid estimation of working capital to the requirements of the concern and then forcing it to adhere to the estimate. Deviations from the estimate are not allowed and the estimate will not provide for any contingencies or for any unexpected events.

2. Relaxed Policy:

It involves the allowing of sufficient cushion for fluctuations in funds requirement for financing various items of working capital. The estimate is made after taking into account the provision for contingencies and unexpected events.

3. Moderate Policy:

The working capital level estimated in between the two extremes i.e. restricted and relaxed policies. The relationship of sales and corresponding levels of investment current assets is show in Figure below:

Current Assets
C1 Related policy
C1 Moderate Policy
C Restricted policy

Sales (Rs.)

Figure: Level of Current Assets Indifferent Policies

When the company adopts restricted policy for a sales level of 'S' It maintains the current assets level of 'C' Under this policy the company maintains lower investments incurrent assets, represents aggressive approach, intend to yield high return and accepting higher risk. The management is ready to counter any financial difficulties arising out of restricted policy. Under relaxed policy, the company maintains current assets up to the level of 'C' , for the same level of sales (S) as in restricted policy.

This policy represents conservative approach. It allows the company to have sufficient cushion for uncertainties contingencies seasonal fluctuations, changes in activity, levels changes in sales etc. The level of investment in current assets is high which results in lesser return, but the risk level is also reduced. In moderate policy, the investment in currents lies in between C and C2 With this policy, the expected profitability and risk levels fall between relaxed policy and restricted policy. The higher the level of investment in current assets represents the liberal working capital policy in which the risk level is less and also the marginal return is also lesser. In restricted policy the level of investment in current assets lesser and high risk is perceived for increase of marginal return on investment. The determination of level of investment in currents is dependent on risk return perception of the management.

Illustration 2.1

The financing pattern, current ratio, profitability net working capital position is explained under conservative moderate and aggressive working capital policies are explained by way of hypothetical figures as follows :

Particulars	Working Capital Policy		
	Conservative	Moderate	Aggressive
Fixed assets	40	40	40
Current assets	40	35	30
Total assets	80	75	70
Share Capital	40	35	30
Debentures (@ 12%)	30	25	20
Current liabilities (short-term Loan @ 8%)	10	15	20
	80	75	70
Current assets	40	35	30
Less: Current liabilities	10	15	20
Net working capital	30	20	10
Current assets financed by:			
Short term sources	10	15	20
Long term sources	30	20	10
	40	35	30
Current ratio (current assets/ current/liabilities) (times)	4.0	2.33	1.5
Sales	180	180	180
EBIT (15% on sales)	27.00	27.00	27.00
Less : Interest			
Interest on Debentures (@ 12%)	3.60	3.00	2.40
Interest on short term Loans (@ 8%)	0.80	1.20	1.60
	22.60	22.80	23.00
Less : Tax @ 40%	9.04	9.12	9.20
EAT	13.56	13.68	13.80
Return on investment (Eat/Total assets) x 100	16.95 %	18.24%	19.71%

Analysis – We can observe from the above analysis that current ratio is 4 times if conservative policy is followed, it has dropped to 1.5 in management of working capital under aggressive policy. However, the return on investment has increased from 16.95% to 19.71%, if aggressive approach is adopted Higher risk is attached with the higher return, under

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aggressive policy. In conservative approach majority of current assets are financed from long term sources of finance. When it comes to financing current asserts under aggressive approach, majority of current assets are financed from short term sources. The moderate policy stands in between two extremes of conservative and aggressive financing approaches. Majority of the corporates follow the moderate policy of working capital financing which enables to avoid higher risk and to earn moderate profit margin on additional investments in current assets.

Illustration – 2.2

The Balaji Company is attempting to establish a current assets policy. Fixed assets are Rs. 6 lakhs and the firm plan to maintain a 50% debt-to-assets ratio. The interest rate is 10% on all debts. Three alternative current assets policies are under consideration. - 40%, 50% and 60% of projected sales. The company expects to earn 15% before interest and taxes on sales or Rs.30 lakhs. Calgary's effective tax rate is 40%. What is the expected return on equity under each alternative? (C.S. Final Dec. 1908).

Balance sheets Under Different Current Assets Policies

Particulars	Restricted Policy (40%of sales)	Moderate Policy (50% of sales)	Relaxed Policy (60% of sales)
Current assets	12,00,000	15,00,000	18,00,000
Fixed assets	6,00,000	6,00,000	6,00,000
Total Assets	18,00,000	21,00,000	24,00,000
10% Debt (50% of total Assets)	9,00,000	10,50,000	12,00,000
Equity	9,00,000	10,50,000	12,00,000
Total Claims	18,00,000	21,00,000	24,00,000

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Particulars Policy	Restricted Policy (aggressive)	Moderate Policy	Relaxed Policy (conservative)
Sales	30,00,000	30,00,000	30,00,000
EBIT (15% OF SALES)	4,50,000	4,50,000	4,50,000
Interest (10%)	90,000	1,05,000	1,20,000
EBT	3,60,000	3,45,000	3,30,000
Taxes (40%)	1,44,000	1,38,000	1,32,000
Net Income	2,16,000	2,07,000	1,98,000
Return on Equity (ROE)	24%	19.71%	16.50%
	2,16,000 * 100 9,00,000	2,07,000 * 100 10,50,000	1,98,000 *100 12,00,000

2.10 WORKING CAPITAL RATIOS

Working capital ratios indicate the ability of a business concern in meeting its current obligations as well as its efficiency in managing the current assets for generation of sales. These ratios are applied to evaluate the efficiency with which the firm managers and utilises its current assets. The following three categories of ratios are used for efficient management of working capital

(1) Efficiency ratios
(2) Liquidity ratios
(3) Structural health ratios.

2.10.1 EFFICIENCY RATIOS:

2.10.1.1 Working Capital to Sales Ratio:

This ratio is computed by dividing sales by working capital. this ratio helps to measure the efficiency of the utilization of net working capital. It signifies that for an amount of sales, a relative amount of working Capital is needed. If any increase in sales is contemplated working capital should be adequate and thus the ratio helps management to maintain the adequate level of working Capital. This ratio measures the efficiency with which the working capital is being used by a firm. A high ratio indicates

efficient utilization of working capital. But a very high ratio is not a good indication for any firm, which may be due to overtrading.

$$= \frac{\text{Sales}}{\text{Working Capital}}$$

2.10.1.2 Inventory Turnover Ratio:

The ratio establishes relationship between the sales with average stock. It measures the velocity of converting stock into sales. This ratio indicates the effectiveness and efficiency of the inventory management. The ratio shows how speedily the inventory is turned into accounts receivable through sales. The higher the ratio, the more efficiency the inventory is said to be managed and vice versa. A high ratio indicates efficient management of inventory because more frequently the stocks are sold, the lesser amount of money is requi5edto finance the inventory. A low ratio indicates an inefficient management of inventory over investment in inventory. Sluggish business poor quality of goods and lower profit as compared to total investment.

$$= \frac{\text{Sales}}{\text{Inventory}}$$

2.10.1.3 Current Assets Turnover Ratio:

This ratio indicates the efficiency with which current assets turn into sales. A higher ratio implies by and large a more efficient use of funs. Thus, a high turn over rate indicates reduced lock up of funds in current assets. An analysis of this ratio over a period of time reflects working capital management of a firm.

$$= \frac{\text{Sales}}{\text{Current Assets}}$$

2.10.2 LIQUIDITY RATIOS:

2.10.2.1 Current Ratio

The current ratio is calculated by dividing current assets to current liabilities. The current ratio is a measure of firm's short term solvency. It indicates the availability of current asserts in rupees for every one rupee of current liability. This ratio indicates the extent of the soundness of the current financial position of an undertaking and the degree of safety provided to the creditors. The higher the current ratio, the larger amount of rupee available per rupee of current liability, the more the firm's ability to meet current obligations and the greater safety of funds of short term creditors current assets are those assets which an be converted into cash within a year. Current liabilities and provisions are those liabilities that

are payable within a year. A current ratio of 2:1 indicates a highly solvent position. A current ratio of 1.33: 1 is considered by banks as minimum acceptable level for providing working capital finance. The constituents of the current assets are as important as the current assets themselves for evaluation of company's solvency position.

$$= \frac{\text{Current Assets, Loans \& Advances}}{\text{Current Liabilities \& Provisions}}$$

2.10.2.2 Quick Ratio/Liquid ratio/ Acid test ratio:

Quick ratio expresses the relationship between quick (current) assets and quick (current) liabilities. While calculating of quick ratio, inventories are excluded from current assets, sine inventories cannot be converted in to cash in short time without loss of value. This ratio is a more refined tool to measure the liquidity of an organization. It is a better test of financial strength than the current ratio because it excludes very slow moving inventories and the items of current assets which cannot be converted into cash easily. This ratio shows the extent of cushion of protection provided from the quick assets to the current creditors. A quick ratio of 1:1 is usually considered satisfactory though it is again a rule of thumb only.

$$= \frac{\text{Current Assets, Loans and Advances} - \text{Inventories}}{\text{Current Liabilities \& Provisions} - \text{Bank Overdraft}}$$

2.10.2.3 Absolute Liquid Ratio:

Even though debtors and bills receivable are considered as more liquid than inventories, it cannot be converted into cash immediately or in time. Therefore, while calculation of absolute liquid ratio, only the absolute liquid assets like cash in hand, cash at bank, short term marketable securities are taken into consideration, to measure the ability of company in meeting short term financial obligations. An ideal ratio is 0.5:1:

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

2.10.3 STRUCTURAL HEALTH RATIOS:

2.10.3.1 Current Assets to Total Net Assets:

This ratio explains the relationship between current assets and total investment in assets. A business enterprise should use its current assets effectively and economically because it is out of the management of these assets that profits accrue. A business will end up in losses if there is any lacuna in managing the asserts to the advantage of business.

$$= \frac{\text{Total Net Assets}}{\text{Current Assets}}$$

Composition of Current Assets:

An analysis of current assets component enables one to examine in which component the working capital funds are locked up. A large tie up of funds in inventories effects profitability of the business adversely owing to carry over costs. In addition, losses are likely to occur by way of depreciation, decay, obsolescence, evaporation and so on. Receivables, constituting another component of current assets. If the major portion of current asserts are made up of cash alone, the profitability will be decreased because cash is a non earning asset. If the portion of cash balance is excessive, then it can be said that management is not efficient to employ the surplus cash.

2.10.3.2 Debtors Turnover Ratio:

This ratio shows the extent of trade credit granted and the efficiency in the collection of debts. Thus, it is an indicative of efficiency of the credit management. The lower the debtors to sales ratio, the better the trade credit management and better the quality (liquidity) of debts. The lower debtors mean prompt payment by customers. An excessively long collection period, on the other hand, indicates a very liberal, ineffective and inefficient credit and collection policy.

$$= \frac{\text{Credit Sales}}{\text{Debtors}}$$

2.10.3.3 Debtors Collection Period (In days)

This ratio measures how long it takes to collect amounts from debtors. The ratio represents the average number of days, for which a firm has to wait before their receivables are converted into cash. It measures the quality of debtors. The shorter average collection period is considered the high-quality debtors. A higher collection period implies inefficiency in collection of debtors, which in turn adversely affects the liquidity or short-term paying capacity of the firm. The longer the average collection period higher the chances for turning into bad debts. The actual collection period can be compared with the stated credit terms of the company. If it is loner than those terms, then this indicates some insufficiency in the procedures for collecting debts.

$$= \frac{\text{Debtors}}{\text{Credit Sales}} \times 365$$

2.10.3.4 Bad Debts to Sales

This ratio indicates the efficiency of the control procedures of the company. The actual ratio is compared with the target or norm to decide whether or not it is acceptable.

$$= \frac{\text{Bad Debts}}{\text{Sales}}$$

2.10.3.5 Creditors Payment Period (In days)

The measurement of the credit or payment period shows the average time taken to pay for goods and services purchased by the company. In generally the longer of the credit period achieved the better because delays in payment mean that the operations of the company are being financed interest free by suppliers' funds. But there will be a point beyond which, if they are operating in a seller's market, may harm the company. If too long a period is taken to pay creditors, the credit rating of the company may suffer, thereby making it more difficult to obtain suppliers credit in the future.

$$= \frac{\text{Creditors}}{\text{Credit Purchasers}} \times 365$$

Illustration 2.3

Bajaj Ltd. manufacturer water filters. The current ratio at the end of the last year was 3:1 which appeared to be comfortable. However, the cash flow position, in reality, is rather weak and the company finds it difficult to effect payments to the suppliers and workers on time. The composition of working capital as per the last balance sheet is provided hereto.

	(Rs)
Current Assets:	
Inventories	18,00,000
Receivables	12,00,000
Cash and bank balances	1,00,000
Loans and advances	20,00,000
Total Current Assets	51,00,000
Current Liabilities	17,00,000

Mention specific possibilities of what might be causing cash flow difficulties in this context. Suggest any better ratios which the company might use to gauge its liquidity in future.

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Solution:

Current Assets :	Rs
Inventories	18,00,000
Receivables	12,00,000
Cash and Bank balances	1,00,000
(i) Total Current Assets	51,00,000
(ii) Current Liabilities	17,00,000
Working Capital (i) - (ii)	34,00,000

Analysis

(a) Current Ratio

$$\frac{\text{Current assets, loans and advances}}{\text{Current liabilities}} = \frac{51,00,000}{17,00,000} = 3 : 1$$

The current ratio is satisfactory, since it is above the ideal current ratio of 2 : 1

(b) Quick Ratio

$$\frac{\text{Current assets, loans and advances} - \text{Stock} - \text{Prepaid Expenses}}{\text{Current liabilities} - \text{Bank Overdraft}}$$

$$= \frac{51,00,000 - 18,00,000}{17,00,000} = 1.94 : 1$$

The quick ratio is also satisfactory, since the desired quick ratio is 1 : 1 but the actual quick ratio is 1.94 : 1. the company is in a position to meet its short term financial obligations :

(c) Super Quick Ratio

$$\frac{\text{Cash and marketable securities}}{\text{Current liabilities}} = \frac{1,00,000}{17,00,000} = 0.06 : 1$$

The Company's cash and bank balances are grossly insufficient to meet the day to day financial needs and contingencies.

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(d) Composition of Current Assets

Current assets	Rs.	Proportion (%)
Inventories	18,00,000	35.29
Receivables	12,00,000	23.53
Cash ad bank	1,00,000	1.96
Loans and advances	20,00,000	39.22
	----------	---------
	51,00,000	100%

The analysis of composition of current assets indicate the following

- Excess investments in inventories could be held. Dormant and non-moving stock may also include in inventories.
- The receivables should be further classified into good doubtful and bad amounts.
- Cash and bank balances may not be sufficient to meet the4 day to day obligation.
- Substantial amount of working capital is locked up in loans and advances which may not relate to the business.

(e) Stock turn over ratio, Receivables turnover ratio, debtors, collection period, Creditors payment period, working capital turnover ratio, current assets to total assets ratio should also be calculated for the ascertainment or efficiency in working capital management.

2.11 WORKING CAPITAL LEVERAGE

One of the important objectives of working capital management is by maintaining the optimum levels of investment in current assets and by reducing the levels of current liabilities, the company can minimize the investments in working capital thereby improvement in return on capital employed is achieved. The term working capital leverage, refers a to the impact of level of working capital on company's profitability. The working capital management should improve the productivity of investments in current assets ad ultimately it will increase the return on capital employed. Higher levels of investment in current assets than is actually required mean increase ion the cost of interest charges on the short-term loans and working capital finance raised from banks etc. and will result in lower return on capital employed and vice versa. Working capital leverage measures the responsiveness of ROCE for changes in current assets. It is measured by applying the following formula:

$$\text{Working Capital Leverage} = \frac{\text{\% change in ROCE}}{\text{\% change in Current Assets}}$$

$$\text{Return on Capital Employed (ROCE)} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Total Assets}}$$

The working capital leverage reflects the sensitivity of the return on capital employed to the changes in level of current assets. Working capital leverage would be less in the case of capital-intensive units, even though total capital employed is same. Working Capital leverage expresses the relation of efficiency of working Capital management with the profitability of the company.

$$\text{Working Capital Leverage} = \frac{CA}{T.A. - C.A.}$$

Where C.A. = Current Assets

T.A = Total Assets (i.e. Net Fixed Assets + Current Assets)

C.A = Changes in Current Assets

Illustration 2.4

From the following information calculate the responsiveness of ROCE for changes in current assets:

Particulars	**Company A**	**Company B**
Fixed assets	300	200
Current assets	200	300
Total Assets	500	500
EBT	90	90
ROCE	18%	18%

Calculation of responsiveness of ROCE if the current assets decline by 20% over the existing level is calculate Working Capital Leverage

Solution:

$$\text{Working Capital Leverage} = \frac{C.A}{T.A. - C.A.}$$

$$\text{Company A} = \frac{\text{Rs.200 lakhs}}{\text{Rs. 500 lakhs} - \text{Rs.40 lakhs}} = 0.435$$

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$$\text{Company B} = \frac{\text{Rs.300 lakhs}}{\text{Rs.500 lakhs} - \text{Rs.60 lakhs}} = 0.682$$

Analysis - From the above analysis it is observed that working capital leverage is higher for Company B and therefore it is more responsive as compared to Company A

Illustration 2.5

Following information is given of Stars Ltd.	(Rs. Lakhs)
Fixed assets	300
Current assets	200
Total assets	500

The entire current assets are being financed by the bank fiancé @ 16% p.a. The earnings before tax (EBT) of the company is Rs.100 lakhs. The company is planning to reduce its level of investments in current assets by Rs.100 lakhs with an efficient working capital management. Show the impact of change in working capital on the Company's Return on Investment (ROI).

Solution:

(i) Calculation of ROI prior to Reduction in current Assets

$$\text{ROI} = \frac{\text{EBT}}{\text{Total assets}} \times 100 = \frac{\text{Rs.100 lakhs}}{\text{Rs.500 lakhs}} \times 100 = 20\%$$

(ii) Calculations of ROI after Reduction of current Assets to Rs.100 lakhs

EBT	100
Add: Savings in interest charges due to reduction In investment in current assets	16
Total EBT	116

$$\text{Revised ROI} = \frac{\text{Rs.116 lakhs}}{\text{Rs.400 lakhs}} \times 1 -- = 29\%$$

Analysis: With the efficient management of working capital, by reducing the level of investments in current assets the company can improve its return on investment from 20% to 29%

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2.12 ESTIMATION OF WORKING CAPITAL

There are three methods for estimating the working capital requirements of a firm :

(i) Percentage of sales method

(ii) Regression analysis method

(iii) Operating cycle method.

2.12.1 Percentage of Sales Method:

It is a traditional and simple method of determining the level of working capital and its components. In this method, working capital is determined on the basis of past experience. If, over the years, the relationship between sales and working capital is found to be stable then this relationship may be taken as a base for determining the working capital for future. This method is simple, easy to understand ad useful for projecting relatively short t4rm changes in working capital. However, this method cannot be recommended for universal application because the assumption of linear relationship between sales and working capital may not hold good in all cases.

Illustration 2.6

ABC Ltd. has achieved a turn over of Rs.85 Crores for the accounting year 2006-07. It is anticipated that the turnover of the company will reach rs.110 crores for the year 2007-08. The financial position of the company as o 31satMarch, 2005 as follows

(Rs. in Crores)

Liabilities	**Rs.**	**Assets**	**Rs.**
Equity share capital	10	Land and Buildings	4
Reserves and surplus	4	Plant and machinery	5
Secured loans	5	Inventories	11
Unsecured loans	3	Receivables	7
Sundry creditors	6	Cash and bank	3
Provision for taxation	2		
	30		**30**

Estimate the working capital requirement for the year 2007-08?

Solution:

Estimation of Working Capital Requirement for 2007-08

Particulars	Actuals 2006-07 (Rs.crores)	% to sales 2006-07	Estimate 2007-08 (Rs.Crores)
Sales	85	100	110
Current Assets			
Inventories	11	12.9	14.19
Receivables	7	8.2	9.02
Cash in bank	3	3.5	3.85
(a)	21	24.6	27.06
Current Liabilities			
Sundry creditors	6	7.1	7.81
Provision for taxation	2	2.4	2.64
(b)	8	9.5	10.45
Working capital (a)-(b)	13	15.01	16.61

2.13 STEPS IN DETERMINATION OF WORKING CAPITAL

The individual components method of estimation of working capital involves the following steps:

Step 1 Identify the various items of current assets and current liabilities which consist in determination of working capital. The4 current assets include inventory of raw materials, WIP and finished goods, sundry debtors, pre-paid expenses desired cash balance etc. The current liabilities include, creditors for raw materials stores and consumables, creditors for wages creditors for expenses etc.

Step 2 (a) Estimate the holding period of each item stock i.e. raw materials, WIP and finished goods.

(b) Estimate the collection period of sundry debtors

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(c) Estimate the desired cash balance for meeting the requirements of day to day operations.

(d) Estimate the desired cash balance for meeting the requirements of day to day operations.

(e) Estimate the lag in payment of wages and expenses

Step 3 (i) Determine the raw material, labour and overheads cost per unit

(ii) Determine the operating level.

(iii) Determine the percentage of conversion cost incurred on WIP

(iv) Determine the cost of sale and selling price per unit.

Step 4 Ascertain the value of each item of current assets and current liabilities taking into account the information in step (2) and step (3)

Step 5 Put the values of current assets and current liabilities in a statement form and ascertain the net working capital (i.e. current assets – current liabilities) after adding up the desired cashbalance and amount needed for meeting contingencies.

Illustration 2.7

The Board of Directors of INDIGO Ltd. requests you to prepare a statement showing the working capital requirements forecast for a level of activity of 1,56,000 units of production. The following information is available for your calculation:

Raw materials	90
Direct labour	40
Overheads	75

	205
Profit	60

Selling price per unit	265

(a) Raw materials are in stock on average one month.

(b) Materials are in process on average 2 weeks

(c) Finished goods are in stock on average one month

(d) Credit allowed by suppliers one month.

(e) Time lag in payment from debtors – 2 months

(f) Lag in payment of wages - 1½ weeks

(g) Lag in payment of overheads – one month

20% of the out put is sold against ash. Cash in hand and at bank is expected to be Rs.60,000. It is to be assumed that production is carried on evenly throughout the year. Wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month

Solution:

Working Notes

$$(1)\text{Raw Material} = \frac{1{,}56{,}000 \text{ units}}{\text{Rs.}10{,}80{,}000} \times 4 \text{ weeks} \times \text{Rs.}90 = 52 \text{ weeks}$$

$$(2)\text{Work in progress} = \frac{1{,}56{,}000 \text{ units}}{52 \text{ weeks}} \times 2 \text{ weeks} = \text{Rs.}6{,}000 \text{ units}$$

Raw materials	(6,000 units @ Rs.90)	5,40,000
Wages	(6,000 units @ Rs.40 x ½)	1,20,000
Overheads	(6,000 units @ Rs.75 x ½)	2,25,000
Total value of WIP		8,85,000

$$(3)\ \text{Finished Goods} = \frac{1{,}56.000}{52 \text{ weeks}} \times 4 \text{ weeks} \times \text{Rs.}205$$

$$= \text{Rs.}24{,}60{,}000$$

$$(4)\ \text{Debtors} = \frac{1{,}56{,}000 \text{ units}}{52 \text{ weeks}} \times 8 \text{ weeks} \times \text{Rs.}205 \times \frac{80}{100}$$

$$= \text{Rs. } 39{,}36{,}000$$

$$(5)\ \text{Creditors} = \frac{1{,}56{,}000 \text{ units}}{52 \text{ weeks}} \times 4 \text{ weeks} \times \text{Rs.}90 = \text{Rs. } 10{,}80{,}000$$

$$(6)\ \text{Wages} = \frac{1{,}56{,}000}{52 \text{ weeks}} \times 1.5 \text{ weeks} \times \text{rs.}40 = \text{Rs. } 1{,}80{,}000$$

$$(7)\ \text{Expenses} = \frac{1{,}56{,}000 \text{ units}}{\textbf{52 weeks}} \times 4 \text{ weeks} \times \text{Rs.}75 = \text{Rs. } 9{,}00{,}000$$

Statement of Working Capital Required			(Rs)
Current Assets :			
Cash in hand and cash at bank			60,000
Stock in hand :			
Raw materials		10,80,000	
Work in process		8,85,000	
Finished goods		24,60,000	
		----------	44,25,000
Sundry debtors			39,36,000

	(a)		84,24,000
Current liabilities			
Sundry creditors			10,80,000
Wages payable			1,80,000
Expenses payable			9,00,000

		(b)	21,60,000

Net working capital employed	(a) - (b)		61,61,000

Illustration 2.8

From the following details you are required to make an assessment of the average amount of working capital requirement of HINDALCO Ltd.

Particulars	Average period of credit	Estimate for the 1st year (Rs)
Purchase of material	6 weeks	26,00,000
Wages	1½ weeks	19,50,000
Overheads :		
Rent rates etc.	6 months	1,00,000
Salaries	1 month	8,00,000
Other overheads	2 months	7,50,000

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Sale cash		2,00,000
Credit sales	2 months	60,00,000
Average amount of stocks and work in progress		4,00,000
Average amount of un drawn pro		3,00,000

It is to be assumed that all expenses and income were made at even rate for the year.

Solution:

Assessment of average amount of Working capital requirement

Current Assets		
Stock and work in progress		4,00,000
Debtors	(Rs.60,00,000 x 2/12)	10,00,000
	(a)	14,00,000
Current Liabilities :		
Lag in payments :		
Purchases	(Rs.26,00,000 x 6/52)	3,00,000
Wages	(Rs.19,50,000 x 15/52)	56,250
Rent	(Rs.1,00,000 x 6/12)	50,000
Salaries	(Rs.8,00,000 x 1/12)	66,667
Other overheads	(Rs.7,50,000 x 2/12)	1,25,000
	(b)	5,97,917
Total Working Capital Requirements	(a) - (b)	8,02,083
Less : Average amount of undrawn profit		3,00,000
Working Capital Required		5,02,083

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3

RECEIVABLE MANAGEMENT

Unit Structure:

3.1 Meaning And Importance

3.2 Objective of Receivables Management

3.3 Aspects of Receivable Management

3.4 Credit Policies

3.5 Credit Terms

3.6 Control of Accounts Receivables

3.1 MEANING AND IMPORTANCE

The term 'receivables' is defined as 'debt' owed to the firm by customers arising from sale of goods or services in the ordinary course of business. When a firm makes an ordinary sale of goods or services and does not receive payment, the firm grants trade credit and creates accounts receivable which could be collected in the future. Receivables management is also called "Trade credit management". Thus, accounts receivable represents an extension of credit of customers, allowing them a reasonable period of time which to pay for the goods received.

The sale of goods on credit is an essential part of the modern competitive economic systems. In fact, credit sales and therefore, receivables are treated as a marketing tool to aid the sale of goods. The credit sales are generally made to open account in the sense that there are no formal acknowledgements of debt obligations through a financial instrument. As a marketing tool, they are intended to promote sales and thereby profits. However, extension of credit involves risk and cost Management should weight the benefits as well as cost to determine the goal of receivables management.

3.2 OBJECTIVE OF RECEIVABLES MANAGEMENT

The objective of receivables management is "to promote sales and profits until that point is reached where the return on investment in further funding receivables is less than the cost of funds raised to finance that additional credit (i.e. cost of capital).

3.3 ASPECTS OF RECEIVABLE MANAGEMENT

The specific costs and benefits which are relevant to the determination of the objectives of receivables management are examined below.

3.3.1 COSTS

The major categories of costs associated with the extension of credit and accounts receivable are:

(i) Collection cost,

(ii) Capital cost

(iii) Delinquency cost and

(iv) Default cost.

3.3.1.1 Collection Cost

Collection costs are administrative costs incurred in collecting the receivables from the customers to whom credit sales have been made. Included in this category of costs are (a) additional expenses on the creation and maintenance of a credit department with staff, accounting records, stationery postage and other related items, (b) expenses involved in acquiring credit information either through outside specialist agencies or by the staff of the firm itself. These expenses would not be incurred if the firm does not sell in credit.

3.3.1.2 Capital Cost

The increased level of accounts receivable is an investment in assets. They have to be financed thereby involving a cost. There is a time lag between the sale of goods to, and payment by, the customers. Meanwhile, the firm has to pay employees and suppliers of raw materials, there by implying that the firm should arrange for additional funds to meet its own obligations while waiting for payment from its customers. The cost on the use of additional capital to support credit sales, which alternatively could be profitably employed elsewhere, is therefore, a part of the cost of extending credit or receivables.

3.3.1.3 Delinquency Cost

This cost arises out of the failure of the customers to met their obligations when payment on credit sales become due after the expiry of the credit period. Such costs are called delinquency costs. The important components of this cost are: (i) blocking up of funds for an extended period (ii) cost associated with steps that have to be initiated to collect the over dues, such as reminders and other collection efforts, legal charges, where necessary, and so on.

3.3.1.4 Default Cost

Finally, the firm may not be able to recover the overdoes because of the inability of the customers. Such debts are treated as bad debts and have to be written off as they cannot be realised. Such costs re known as default costs associated with credit sales and accounts receivable.

3.3.2 BENEFITS

Apart from the costs, another factor that has a bearing on accounts receivable management is the benefit emanating from credit sales. The benefits are the increased sales and anticipated profits because of a more liberal policy. When firms extend trade credit, that is, invest in receivables, they intend to increase the sales. The impact of a liberal trade credit policy is likely to take two forms. First, it is oriented to sales expansion. In other words, a firm may grant trade credit either to in crease sales to existing customers or attract new customers. This motive for investment in receivables is growth oriented. Secondly the firm may extend credit to protect its current sales against emerging competition. Here, the motive is sales retention. As a result of increased sales, the profits of the firm will increase

From the above discussion, it is clear that investments in receivables involve both benefits and costs. The extension of trade credit has a major impact on sales, costs and profitability. Other things being equal, a relatively liberal policy and, therefore, higher investments in receivables, will produce larger sales. However, costs will be higher with liberal policies than with more stringent measures. Therefore, accounts receivable management should aim to a trade off between profit (benefit) and risk (cost). That is to say, the decision to commit funds to receivables (or the decision to grant credit) will be based on a comparison of the benefits and costs involved, while determining the optimum level of receivables. **The costs and benefits to be compared are marginal costs and benefits.** The firm should only consider the incremental (additional) benefits and costs that result from a change in their receivables or trade credit policy.

While it is true that general economic conditions and industry practices have a strong impact on the level of receivables, a firm's investments in this type of current asses is also greatly affected by its internal policy. A firm has little or no control over environmental factors, such as economic conditions and industry practices. But it can improve its profitability through a property conceived trade credit policy or receivables management.

3.4 CREDIT POLICIES

In the preceding discussions it has been clearly shows that the firm's objective with respect to receivables management is not merely to collect receivables quickly, but attention should also be given to the benefit-cost trade-off involved in the various areas of accounts receivable management. The first decision area is credit policies.

The **credit policy** of a firm provides the framework to determine (a) whether or not to extend credit to a customer and (b) how much credit to extend. The credit policy decision of a firm has two broad dimensions: (i) Credit standards and (ii) Credit analysis. A firm has to establish and use standards in making credit decisions, develop appropriate sources of credit

information and methods of credit analysis. We illustrate below how these two aspects are relevant to the account's receivable management of a firm.

3.4.1 CREDIT STANDARDS

The term '**credit standards'** Represents the basic criteria for the extension of credit to customers. The quantitative basis of establishing credit standards are factors such as credit ratings, credit references, average payment period and certain financial ratios. Since we are interested in illustrating the trade off between benefit and cost to the firm as a whole, we do not consider here these individual components of credit standards. To illustrate the effect, we have divided the overall standards into (a) tight or restrictive and (b) liberal or non restrictive. That is to say, our aim is to show what happens to the trade off when standards are relaxed or alternatively tightened.

The trade off with reference to credit standards covers

(i) the collection cost,

(ii) The average collection period/cost of investment in accounts receivable

(iii) level of bad debt losses and

(iv) level of sales.

These factors should be considered while deciding whether to relax credit standards or not. If standards are relaxed, it means more credit will be extended while if standards are tightened, less credit will be extended. The implications of the four factors are elaborated below.

(i) Collection Costs

The implications of relaxed credit are (i) more credit, (ii) a large credit department to service accounts receivable and related matters, (iii) increase in collection costs. The effect of tightening of credit standards will be exactly the opposite. These costs are likely to be semi variable. This is because up to a certain point the existing staff will he able to carry on the increased work load, but beyond that, additional staff would be required. These are assumed to be included in the variable cost per unit and need not be separately identified.

(ii) Investments in Receivables or the Average Collection Period.

The investment in accounts receivable involves, a capital cost as funds have to be arranged by the firm to fiancé them till customers make payments. Moreover, the higher the average accounts receivable, the higher is the capital or carrying cost. A change in the credit standards relaxation or tightening leads to a change in the level of accounts receivable either through a change in (a) sales or (b) collections.

A relaxation in credit standards, as already stated, implies an increase in sales which in turn would lead to higher average

accounts receivable. Further, relaxed standards would mean that credit is extended liberally so that it is available to even less creditworthy customers who will take a longer period to pay overdue. The extension of trade credit to slow paying customers would result in a higher level of accounts receivable.

In contrast, a tightening of credit stands would signify (i) a decrease in sales and lower average accounts receivable ad(ii) an extension of credit limited to more credit worthy customers who a promptly pay their bills and thus, a lower average level of accounts receivable.

Thus, a change in sales and change in collection period together with a relaxation in standards would produce a higher carying cost while changes in sales and collection period result in lower costs when credit standards are tightened. These basic reactions also occur when changes in credit terms or collection procedures are made. We have discussed these in the subsequent sections of this chapter.

(iii) **Bad Debt Expenses**

Bad Debt is another factor which is expected to be affected by changes in the credit standards is bad debt (default) expenses. They can be expected to increase with relaxation in credit standards and decrease if credit standards become more restrictive.

(iv) Sales Volume

Changing credit standards can also be expected to change the volume of sales. As standards are relaxed, sales are expected to increase; conversely, a tightening is expected to cause a decline in sales.

The basic changes and effects on profits arising from a relaxation of credit standards are summarized in the following paragraphs. If the credit standards are tightened, the opposite effects, as shown in the brackets would follow:

Effect of Relaxation of Standards

Item	Direction of Change (Increase = 1 Decrease = D)	Effect on Profits (Positive + Negative -)
1. Sales Volume	1(D)	+(-)
2. Average Collection Period	1(D)	-(+)
3. Bad Debt	1(D)	-(+)

The effect of alternative credit standards is illustrated in the following example.

Illustration 3.1

A firm is currently selling a product @ Rs.10 per unit. The most recent annual sales (all credit) were 30,000 units. The variable cost per unit is rs.6 and the average cost per Unit, given a sales volume of 30,000 units, is Rs.8. the total fixed cost is Rs.60,000. the average collection period may be assumed to be 30 days.

The firm is contemplating a relaxation of credit standards that is expected to result in a 15 per cent increase in units' sales, the average collection period would increase to 45 days with no change in bad debt expenses. It is also expecte4d that increased sales will result in additional net working capital to the extent of rs.10,000. the increase in collection expenses may be assumed to be eligible. The required return on investment is 15 per cent.

Should the firm relax the credit standard?

Solution:

The decision to put the proposed relaxation in the credit standards into effect should be based on a comparison of (i) additional profits on sales and (ii) cost of the incremental investments in receivables. If the former exceeds the latter, the proposal should be implemented, otherwise not.

(i) Profit on Incremental Sales – This can be computed in two ways: (a) long approach and (b) short cut method.

(a) Long Approach: According to this approach, the costs and profits on both the present and the proposed sales level are calculated and the difference in profit at the two levels will be the incremental profit as shown below.

Long Method to Calculate Marginal Profits:

A)	Proposed Plan: 1. Sales Revenue (34,500 units * Rs. 10) 2. Less: Costs (a) Variable Cost (34,500 units * Rs.6) (b) Fixed Cost 3. Profit from Proposed sales	 2,07,000 60,000	 3,45,000 2,67,000 78,000
B)	Current Plan: 1. Sales Revenue (30,000 units * Rs. 10) 2. Less: Costs (a) Variable Cost (30,000 units * Rs.6) (b) Fixed Cost 3. Profit from Current sales	 1,80,000 60,000	 3,00,000 2,40,000 60,000
C)	Marginal profits with new plan (I – II)		18,000

Short Cut Method

The profits on sales will increase by an amount equal to the product of the additional units sold and additional profit per unit. Since the 30,000 units representing the current level of sales absorb all the fixed costs, any additional units sold will cost only the variable cost per unit. The marginal profit per unit will be equal to the difference between the sales price per unit (Rs.10) and the variable cost per unit (Rs.6). The marginal profit/contribution margin per unit would therefore, be Rs.4. The total additional (marginal) profits from incremental sales will be Rs.18,000 (Rs.4,500 x Rs.4).

(ii) Cost of Marginal/Incremental Investment in Receivables – The second variable relevant to the decision to relax credit standards is the cost of marginal investment in accounts receivable. This cost can be computed by finding the difference between the cost of carrying receivables before and after the proposed relaxation in credit standards. It can be calculated as follows:

(i) Turnover of accounts receivable:

$$\text{Proposed Plan} = \frac{\text{Number of days in the year}}{\text{Average collection period}} = \frac{360}{45} = 8$$

$$\text{Present Plan} = \frac{\text{Number of days in the year}}{\text{Average collection period}} = \frac{360}{30} = 12$$

(ii) Total cost of sales:

Present Plan = Number of units x cost per unit

= 30,000 units x Rs.8 = Rs.2,40,000

Proposed Plan = (30,000 units x Rs.8) + (4,500 x Rs.6)

= Rs.2,67,000

(iii) Average investment in accounts receivable:

Present Plan = Rs.2,40,000/12 = Rs.20,000

Proposed Plan = Rs.2,67,000/8 = Rs.33,375

(iv) The cost of marginal investments in accounts receivable:

This is the difference between the average investments in accounts receivable under (i) the proposed plan and (ii) under the present plan. It is calculated as follow:

Average investment with proposed Plan	Rs. 33,375
Less: Average investment with present plan	Rs. 20,000
Marginal investments	Rs. 13,375

Marginal investments represent the amount of additional funds required to finance incremental accounts receivable if the proposal

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to relax the credit standards is implemented. The additional cost of Rs.13,375 is the cost of marginal investment in accounts receivable.

Given 15 per cent as required return on the Investments, the cost

$$= \frac{\text{Rs.13,375} \times 15}{100}$$

$$= \text{Rs.2,006.25}$$

This is an opportunity cost in that the firm would earn this amount from alternative uses if the funds are not tied up in additional accounts receivable.

(v) Cost of working capital:

Rs.10,000 x 0.15 = Rs.1,500

In the above above illustration, since the additional profits on increased sales as a result of relaxed credit standards (Rs.18,000) is considerably more than the cost of incremental investments in accounts receivable (Rs.2,006.25) and working capital (Rs.1,500), the firm should relax its credit standards. Such an action would lead to an overall increase in the profits a of the firm by Rs.14,493.75 (Rs.18,000) – Rs.2,006.25 – Rs.1,500).

The effect of tightening credit standards would be just the opposite and can be illustrated on the above lines.

3.4.2 CREDIT EVALUATION

In addition to establishing Credit standards, a firm should develop procedures for evaluating credit applicants. The second aspect of credit policies of a firm is credit analysis and investigation. Two basic steps are involved in the credit investigation process: (a) obtaining credit information and (b) analysis of credit information It is on the basis of credit analysis that the decisions to grant credit to a customer as well as the quantum of credit would be taken.

(a) Obtaining Credit Information

The first step in credit analysis is obtaining credit information on which to base the evaluation of a customer. The sources of information, broadly speaking, are (i) internal and (ii) external.

(i) Internal: Usually firms require their customers to fill various forms and documents giving details about financial operations. They are also required to furnish trade reference with whom the firms can have contacts to judge the suitability of the customer for credit. This type of information is obtained from internal sources of credit information. Another internal source of credit information is derived from the records of the firms contemplating an extension of credit. It is likely that a particular customer/applicant may have enjoyed credit facility in

the past. In that case, the firm would have information on the behaviour of the applicant(s) in terms of the historical payment pattern. This type of information may not be adequate and may, therefore, have to be supplemented by information from other sources.

(ii) External: The availability of information from external sources to assess the credit-worthiness of customers depends upon the development of institutional facilities and industry practices. In India, the external sources of credit information are not as developed as in the industrially advanced countries of the world. Depending upon the availability, the following external sources may be employed to collect information.

- **Financial Statements** One external source of credit information is the published financial statements, that is, the balance sheet and the profit and loss account. The financial statements contain very useful information. They throw light on an applicant's financial, viability, liquidity, profitability and debt capacity. Although the final statements do not directly reveal the past payment record of the applicant, they are very useful in assessing the over all financial position of a firm, which significantly determines its credit standing.

- **Bank References** Another useful source of credit information is the bank of the firm which is contemplating the extension of credit. The modus operandi here is that the firm's banker collects the necessary information from the applicant's bank. Alternatively, the applicant may be required to ask his banker to provide the necessary information either directly to the firm or to its bank.

- **Trade References** These refer to the collection of information from firms with whom the applicant has dealings and who on the basis of their experience would vouch for the applicant.

- **Credit Bureau Reports** Finally, specialist credit bureau reports from organizations specializing in supplying credit information can also be utilized.

(b) **Analysis of Credit Information** Once the credit information has been collected from different sources, it should be analysed to determine the credit worthiness of the applicant. Although there are no established procedures to analyse the information, the firm should devices one to suit its needs. The analysis should over two aspects (i) quantitative, and (ii) qualitative.

(i) Quantitative: The assessment of the quantitative aspects is based on the factual information available from the financial statements, the past records of the firm and so on. The first step involved in this type of assessment is to prepare an Aging Schedule of the accounts payable of the applicant as well as calculate the average age of the accounts payable. This exercise will give an insight into the past payment pattern of the customer. Another step in analyzing the credit information is through a ratio analysis of the liquidity, profitability and

debt capacity of the applicant. These ratios should be compared with the industry average. Moreover, trend analysis over a period of time would reveal the financial strength of the customer.

(ii) Qualitative: The quantitative assessment should be supplemented by a qualitative/subjective interpretation of the applicant's creditworthiness. The subjective judgment would cover aspects relating to the quality of management. Here, the references from other suppliers, bank references and specialist bureau reports would form the basis for the conclusions to be drawn. In the ultimate analysis therefore the decision whether to extend credit to the applicant and what amount to extend will depend upon the subjective interpretation of his credit standing.

3.5 CREDIT TERMS

The second decision area in accounts receivable management is the credit terms. After the credit standards have been established and the creditworthiness of the customers has been assessed, the management of a firm must determine the terms and conditions on which trade credit will be made available. The stipulations under which goods are sold on credit referred to as **credit terms.** These relate to the repayment of the amount under the credit sale. Thus, credit terms specify the repayment terms of receivables.

Credit terms have three components : (i) credit period, in terms of the duration of time for which trade credit is extended – during this period the overdue amount must be paid by the customer (b) cash discount, if any, which the customer can take advantage of that is, the over due amount will be reduced by this amount, and (c) cash discount period, which refers to the duration during which the discount can be availed of. These terms are usually written in abbreviations, for instance, 2/10 net 30. The three numerals are explained below:

- 2 signifies the rate of cash discount (2 per cent) which will be available to the customers if they pay the overdue within the stipulated time;
- 10 represents the time duration (10 days) within which a customer must pay to be entitled to the discount;
- 30 means the maximum period for which credit is available and the amount must be paid in any case before the expiry of 30 days.

In other words, the abbreviation 2/10 net 30 means that the customer is entitled to 2 per cent cash discount (discount rate) if he pays within 10 days (discount period) after the beginning of the credit period (30 days). If, however, he does not want to take advantage of the discount, he may pay within 30 days. If the payment is not made within a maximum period of 30 days, the customer would be deemed to have defaulted.

The credit terms, like the credit standards, affect the profitability as well as the cost of a firm. A firm should determine the credit terms on the basis of

cost benefit trade off. We illustrate below how the three components of credit terms, namely, rate of discount period of discount and the credit period, affect the trade off. It should be noted that our focus in analysis the credit terms is from the view point of suppliers of trade credit and not the recipients for whom it is a source of financing.

Cash Discount

The cash discount has implications for the sales volumes, average collection period/average investment in receivables, bad debt expenses and profit per unit. In taking a decision regarding the grant of cash discount, the management has to see what happens to these factors if it initiates increase or decrease in the discount rate. The changes in the discount rate would have both positive and negative effects. The implications of increasing or initiating cash discount are as follows:

1. The sales volume will increase. The grant of discount implies reduced prices. If the demand for the products is elastic, reduction in prides will result in higher sales volume.

2. Since the customers to take advantage of the discount, would like to pay within the discount period, the average collection period would be reduced. The reduction in the collection period would lead to a reduction in the investment in receivables as also the cost. The decrease in the average collection period would also cause a fall in bad debt expenses. As a result, profits would increase.

3. The discount would have a negative effect on the profits. This is because the decrease in prices would affect the profit margin per unit of sale.

The effects of increase in the cash discount are summarized in a Table below. The effect of decrease in cash discount will be exactly opposite.

Effects of Increase in Cash Discount

Item	Direction of change (1=increase D=Decrease)	Effect on Profits (Positive or Negative)
Sales volume	1	+
Average Collection Period	D	+
Bad Debt Expenses	D	+
Profit Per Unit	D	-

The cash discount decision is illustrated in the following example.

Illustration 3.2

Assume that the firm in our Example is contemplating to allow 2 per cent discount for payment within 10 days after accredit purchase. It is expected that if discounts are offered, sales will increase by 15 per cent

and the average collection period will drop to 15 days. Assume bad debt expenses will not be affected return on investment expected by the firm is 15 peer cent 60 per cent of the total sales will be on discount should the firm implement the proposals?

Solution

(i) Profit on sales.

= (sale of additional units multiplied by the difference between the sales price and the variable cost per unit)

= 4,500 (Rs.10 – Rs/6) = 4,500 x Rs.4 = Rs.18,000

(ii) Saving on average collection period.

This sing is what would have been earned on the reduced investments in accounts receivable as a result of the cash discount.

$$\text{Average investment in accounts receivable} = \frac{\text{Cost of sales}}{\text{Receivables turn over}}$$

$$\text{(a) Present plan (without discount)} = \frac{(30{,}000 \times \text{Rs.}8)}{12 \text{ (i.e.}360/30)} = \text{Rs.}20{,}000$$

$$\text{(b) Proposed plan (with discount)} = \frac{(30{,}000 \times \text{Rs.}8) + (4500 \times \text{Rs.}6)}{24 \text{ (i.e. } 360/15)}$$

$$= \frac{\text{Rs.}2{,}67{,}000}{24} = \text{Rs.}11{,}125$$

Thus, if cash discount is allowed, the average investments in receivable will decline by Rs.8,875 (i.e. Rs.20,000 – Rs.11,125)

Given a 15 per cent rate of return, the firm could earn Rs.1,331,25 on Rs.8,875. Thus, the saving resulting from a drop in the average collection period is Rs.1331.25

(iii) The total benefits associated with the cash discount –

Profit on additional sale	Rs.18,000.00
Saving in cost	Rs. 1,331.25
Total	Rs. 19,331.25

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(iv) Cash discount:

The cost involved in the cash discount on credit sales i.e, 2 per cent of credit sales = 0.02 x Rs.2,07,000 (i.e. 0.60 x Rs.3,45,000) = Rs.4,140

Thus against a cost of Rs.4,140 the benefit from initiating cash discount is Rs.19,331.25 i.e, there is a net gain of Rs.15,191.25 (Rs.19,331.25 – Rs.4,140). The firm should, therefore, implement the proposal to allow 2 per cent cash discount for payment within 10 days of the credit purchase by the customers.

A similar type of analysis can be made to illustrate the effect of either reduction or elimination of cash discount.

Credit Period

The second component of credit terms is the credit period. The expected effect of an increase in the credit period is summarized bellow.

Effect of Increase in Credit Period

Item	Direction of change (1=increase D=Decrease)	Effect on Profits (Positive or Negative)
Sales volume	1	+
Average Collection Period	1	-
Bad Debt Expenses	1	-

A reduction in the credit period is likely to have an opposite effect. The credit period decision is explained through the following example.

Illustration 3.3

Suppose, a firm contemplating an increase in the credit period from 30 to 60 days. The average collection period which is at present 45 says is expected to increase to 75 days. It is also likely that he bad debt expenses will increase from the current level of 1 per cent to 3 per cent of sale. Total sales are expected o increase from the level of 30,000 units to 34,500 units. The present average cost per unit is rs.8, the variable cost and sales per unit is rs.6 and Rs.10 per unit respectively. Assume the firm expects a rate of returns of 15 per cent.

Should the firm extend the credit period ?

Solution

(i) Profit on additional sales = (Rs.4 x 4,500) = Rs.18,000

(ii) Cost of additional investments in receivables = Average investments with the proposed credit period less

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$$\text{Proposed plan} = \frac{\text{Cost of sales}}{\text{Turn over of receivalues}} \qquad \frac{(\text{Rs.8} \times 30{,}000) + \text{Rs..6} \times 4{,}500}{360 + 75}$$

$$= \text{Rs.55,625}$$

$$\text{Present Plan} = \frac{(\text{Rs.8} \times 30{,}000)}{360 + 45} = \text{Rs.30,000}$$

Additional investment in accounts receivable = Rs.55,625 – Rs.30,000
= Rs.25,625

Cost of additional investment at 15 per cent

= 0.15 x Rs.25,625 = Rs.3,843.75

(iii) Additional bad debt expenses:

This is the difference between the bad debt expenses with the proposed and present credit periods.

Bad debt with proposed credit period = 0.03 x Rs.3,45,000 = Rs.10,350

Bad debt with present Credit period = 0.01 x Rs.3,00,000 = Rs.3,000

Additional bad debt expense = (Rs.10,350 – Rs.3,000) = Rs.7,350

3.6 CONTROL OF ACCOUNTS RECEIVABLES

The third area involved in the accounts receivable management is collection policies. They refer to the procedures followed to collect accounts receivable when, after the expiry of the credit period, they become due. These policies cover two aspects: (i) degree of effort to collect the over dues and (ii) type of collection efforts.

(i) Degree of Collection Effort

To illustrate the effect of the collection effort, the credit policies of a firm may be categorized into (i) strict/light, and (ii) lenient. The collection policy would be tight if very rigorous procedures are followed. A tight collection policy has implications which involve benefits a well as costs. The management has to consider a trade off between them. Likewise, a lenient collection effort also affects the cost benefit trade off. The effect of tightening the collection is discussed below.

In the first place, the bad debt expenses (default cost) would decline. Moreover, the average collection period will be reduced. As a result of these two effects, the firm will benefit and its profits will increase. But there would be a negative effect also. A very rigorous collection strategy would involve increased collection costs. Yet another negative effect may be in the form of a decline in the volume of sales. This may be because

some customers may not like the pressure and intense efforts initiated by the firm, and may switch to other firms.

Basic Trade-off from Tight Collection Effort

Item	Direction of change (1=increase D=Decrease)	Effect on Profits (Positive or Negative)
Bad Debt Expenses	D	+
Average Collection Period	D	+
Sales volume	D	-
Collection Expenditure	1	-

The effect of the lenient policy will be just the opposite.

Illustration 3.4

A firm is contemplating stricter collection policies. The following details are available.

1. At present, the firm is selling 36,000 units on credit at a price of Rs.32 each; the variable cost per unit is Rs.25 while the average cost per unit is Rs.29; average collection period is 58 days' and collection expenses amount to Rs.10,000; bad debts are 3 per cent;

2. If the collection procedures are tightened additional collection charges, amounting to Rs.20,000 would be required, bad debts will be 1 per cent, the collection period will be 40 days; sales volume is likely to decline by 500 units;

Assuming a 20 per cent rate of return on investment, what would be your recommendation? Should the firm implement the decision?

Solution

(i) Bad debt expenses:

(a) Present plan: (0.03 x Rs.11,52,000)	Rs. 34,560
(b) Proposed Plan: (0.01 x Rs.11,36,000)	Rs. 11,360
Savings in bad debt expenses (a-b)	Rs. 23,200

(ii) Average collection period/average investment in receivables

$$\text{(a) Present Plan} = \frac{36{,}000 \times \text{Rs.}29 \times 58\text{days}}{360}$$

$$= \text{Rs. } 1{,}68{,}200$$

$$\text{(b) Proposed Plan} = \frac{((36{,}000 \times \text{Rs.}29) - (500 \times \text{Rs.}25)) \times 40 \text{ days}}{360}$$

	= Rs. 1,14,611	
Savings in average investments (a – b		53,589

Assuming a 20 per cent return, the firm will be able to Earn Rs.10,718 on this saving.

(iii) Sales volume: Since the sales volume will decline

by 500 units, there would be a loss of

Rs.3,500 (500 x Rs.7)

(iv) Additional collection charges = Rs.20,000

Thus, the total benefits from a tightening of the collection policy will be Rs.33,918 (Rs.23,200 + Rs.10,718) and the total cost will be Rs.23,500 (Rs.3,500 + Rs.20,000). Therefore, there would be a net gain of Rs.10,418 (Rs.33,918 – Rs.23,500). The firm should, therefore, implement the proposed strategy.

Illustration 3.5

Super Sports, dealing in sports goods, has an annual sale of Rs.50 lakhs and currently extending 30 days credit to the dealers. It is felt that salers can pick up considerably if the dealers are willing to carry increased stocks, but the dealers have difficulty in financing their inventory. The firm is, therefore, considering shifts in credit policy. The following information is available.

The average collection period now is 30 days
Variable costs, 80 per cent of sales.
Fixed costs, Rs.6 lakh per annum
Required (pre-tax) return on investment: 20 per cent

Credit Policy	Average collection period (days)	Annual Sales (Rs lakh)
A	45	56
B	60	60
C	75	62
D	90	63

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Solution

Evaluation of Proposed Credit Policies

Particulars	Present	Proposed (number of days)			
	(30)	A(45)	B(60)	C(75)	D(9)
(a) Sales revenue	50	56	60	62	63
Less: Variable costs (80% of sales)	40	44.8	48	49.6	50.4
Total contribution	10	11.2	12	12.4	12.6
Less : Fixed costs	6	6	6	6	6
Profit	4	5.2	6	6.4	6.6
Increase in profits due To increase in total Contribution (20% of Sales) compared to Present profits	---	1.2	2	2.4	2.6
(b) Investment in debts: Total cost (VC+FC)	46	50.8	54	55.6	56.4
Debtors turnover (DT) (360 days collection period)	12	8	6	4.8	4
Average investment (total cost + DT)	3.83	6.35	9	11.58	14.10
Additional Investment Compared to present Level	-	2.52	5.17	7.75	10.27
Cost of additional Investment	-	0.50	1.03	1.55	2.05
(c) Incremental profit (a – b)	-	0.70	0.97	0.85	0.55

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Illustration 3.6

ABC Corporation is considering relaxing its present credit policy and is in the process of evaluating two alternative policies. Currently the firm has annual credit sales of Rs.50 lakh and accounts receivable turnover ratio of 4 times a year. The current level of loss due to bad debts is Rs.1,50,000. the firm is required to give a return of 25 per cent on the investment in new accounts receivable. The company's variable costs ate 70 percent of the selling price. Given the following information, which is a better option?

Particular	Present policy	Policy option I	Policy option II
Annual credit sales	Rs.50,00,000	Rs.60,00,000	Rs.67,50,000
Accounts receivable Turnover ratio	4	3	2.4
Bad debt losses	1,50,000	3,00,000	4,50,000

Solution

Relative Suitability of Policy Options

Particulars	Present policy	Policy option-I	Policy option II
Sales revenue	Rs.50,00,000	Rs.60,00,000	Rs.67,50,000
Less: Variable cost (70%)	35,00,000	42,00,000	47,25,000
Contribution margin (manufacturing)	15,00,000	18,00,000	20,25,000
Less: Other relevant Costs:			
Bad debt losses	1,50,000	3,00,000	4,50,000
Investment cost (see working notes)	2,18,750	3,50,000	4,92,187.,50
Contribution margin (final)	11,31,250	11,50,000	10,82,812.50

Working notes

Strictly speaking, investment in accounts receivable should be determined with reference to total cost of goods sold on credit. However, fixed costs re not given. It is assumed that there are no fixed costs and investment in debtors/ receivables is determined with reference to variable costs only.

$$\text{Present policy : } \frac{\text{Rs.35,00,000}}{4} = \text{Rs.8,75,000 x 0.25 = Rs.2,18,750}$$

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$$\text{Policy option I: } \frac{\text{Rs.42,00,000}}{3} = \text{Rs.14,00,000} \times 0.25 = \text{Rs.3,50,000}$$

$$\text{Policy option II: } \frac{\text{Rs.47,25,000}}{2.4} = \text{Rs.19,68,750} \times 0.25 = \text{Rs.4,92,187.5}$$

(ii) Types of Collection Efforts

Another aspect of collection policy relates to the steps that should be taken to collect over dues from the cust0mers. A well-established collection policy should have clear cut guidelines as to the sequence of collection efforts. After the credit period is over and payment remains due the firm should initiate measures to collect them. The effort should in the beginning be polite but with the passé of time, it should gradually become strict. The steps usually taken are (i) letters, including reminders to expedite payment (ii) telephone calls for personal contact; (iii) personal visits; (iv) help of collection agencies and finally, (v) legal action. The firm should take recourse to very stringent measures like legal action only after all other avenues have been fully exhausted. They not only involve a cost but also affect the relationship with the customers. The aim should be to collect as early as possible genuine difficulties of the customers should be given due consideration.

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4

MANAGEMENT OF CASH AND MARKETABLE SECURITIES

Unit Structure :

4.1 Introduction

4.2 Motives Of Holding Cash

4.3 Objectives Of Cash Management

4.4 Factors Determining Cash Needs

4.5 Determining Cash Need

4.6 Cash Budget: Management Tool

4.7 Elements/Preparation Of Cash Budget

4.8 Operating Cash Flows

4.9 Financial Cash Flows

4.10 Cash Management Models

4.11 Cash Management Techniques/Processes

4.12 Marketable Securities

4.1 INTRODUCTION

Cash Management is one of the key areas of working capital management. Apart from the fact that it is the most liquid current asset, cash is the common denominator to which all current assets can be reduced because the other major liquid assts, that is, receivable and inentory get eventually converted into cash. This underlines the significance of cash management.

The present Chapter gives a detailed account of the problems involved in managing cash. The first Section outlines the motives for holding cash followed by the objectives of cash management in Section two. Section 3 presents a discussion of the factors determining cash needs. The approaches to derive optimal cash balances, namely, cash management models and cash budgets are examined in depth in section 4. the basic strategies for efficient management of cash are the subject matter of Section 5. we have explained specific techniques to manage cash subsequently. The remainder of the chapter is devoted to the discussion of marketable securities. the Chapter concludes with a summary of the major points.

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4.2 MOTIVES OF HOLDING CASH

The term '**cash'** with reference to cash management is used in two senses. In a narrow sense, it it used broadly to cover currency and generally accepted equivalents of cash, such as cheques, drafts and demand deposits in banks. The Broadview of cash also includes near cash assets, such as marketable securities and time deposits in banks. The maintenance characteristics of these is that they can be readily sold and converted into cash. They serve as a reserve pool of liquidity that provides cash quickly when needed. They also provide a short-term investment outlet for exceeds cash and are also useful for meeting planned outflow of funds. Here, the term cash management is employed in the broader sense. Irrespective of the form in which it is held, a distinguishing feature of cash as an asset is that it has no earning poser. If cash does not earn any return, why is it held?

There are four primary motives for maintaining cash balances:

(i) Transaction motive;

(ii) Precautionary motive;

(iii) Speculative motive and

(iv) compensating motive.

4.2.1 Transaction Motive:

An important reason for maintaining cash balances is the **transaction motive.** This refers to the holding of cash to meet routine cash requirements to finance the transactions which a firm carries on in the ordinary course of business. A firm enters into a variety of transactions to accomplish its objectives which have to be paid for in the form of cash. For Illustration, cash payments have to be made for purchases, wages operating expenses, financial charges like interest, taxes, dividends and so on. Similarly, there is a regular inflow of cash to the firm from sales operations, returns on outside investments and so on. These receipts and payments constitute a continuous two-way flow of cash. But the inflows (receipts) and outflows (disbursements) do not perfectly coincide or synchronize. At times, receipts exceed outflows while, at other times, payments exceed inflows. To ensure that the firm can meet its obligations when payments become due in a situation in which disbursements are in excess of the current receipts, it must have an adequate cash balance. The requirement of cash balances to meet routine cash needs is known as the **transaction motive** and such motive refers to the holding of cash to meet anticipated obligations whose timing is not perfectly synchronized with cash receipts. If the receipts of cash and its disbursements could exactly coincide in the normal course of operations, a firm would not need cash for transaction purposes. Although a major part of transaction balances are held in cash, a part may also be in such marketable securities whose maturity conforms to the timing of the anticipated payments, such as payment of taxes, dividends, and so on.

4.2.2 Precautionary Motive:

In addition to the non synchronization of anticipated cash inflows and outflows in the ordinary course of business, a firm may have to pay cash for purposes which cannot be predicted or anticipated. The unexpected cash need at short notice may be the result of:

- Floods, strikes and failure of important customers;
- Bills may be presented for settlement earlier than expected;
- Unexpected slow down in collection of accounts receivable;
- Cancellation of some order for goods as the customer is not satisfied; and
- Sharp increase in cost of raw materials.

The cash balances held in reserve for such random and unforeseen fluctuations in cash flows are called as **precautionary balances.** In other words, precautionary motive of holding cash implies the need to hold cash to meet unpredictable obligations. Thus, precautionary cash balance serves to provide **a cushion to meet unexpected contingencies.** The more unpredictable are the cash flows, the larger is the need for such balances.

Another factor which has a bearing on the level of such cash balances is the availability of short-term credit. If a firm can borrow at short notice to pay for unforeseen obligations, it will need to maintain a relatively small balance and vice versa.

Such cash balances are usually held in the form of marketable securities so that they earn a return.

4.2.3 Speculative Motive:

It refers to the desire of a firm to take advantage of opporttnities which present themselves unexpected moments and which re typically outside the normal course of business. While the precautionary motive is defensive in nature in that firms must make provisions to tide over unexpected contingencies, the speculative motive represents a positive and aggressive approach. Firms aim to exploit profitable opportunities and keep cash in reserve to do so. The speculative motive helps to take advantage of :

- An opportunity to purchase raw materials at a reduced price on payment of immediate cash;
- A chance to speculate on interest rate movements by buying securities when interest rates are expected to decline;
- Delay purchase of raw materials on the anticipation of decline in prices; and
- Make purchase at favourable prices.

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4.2.4 Compensating Motive:

Yet another motive to hold cash balance is to compensate banks for providing certain services and loans.

Banks provide a variety of services to business firms, such as clearance of cheque, supply of credit information, transfer of funds, and so on. While for some of these services banks charge a commission or fee, for others they seek indirect compensation. Usually clients are required to maintain a minimum balance of cash at the bank. Since this balance cannot be utilized by the firms for transaction purposes, the banks themselves can use the amount to earn a return. Such balances are **compensating balances.**

Compensating balances are also required by some loan agreements between a bank and its customers. During periods when the supply of credit is restricted and interest rates are rising, banks require a burrower to maintain a minimum balance in his account as a condition precedent to the grant of loan. This is presumably to compensate the bank for a rise in the interest rate during the period when the loan will be pending.

The compensating cash balances can take either of two forms (i) an absolute minimum, say, Rs.5 lakh, below which the actual bank balance will never fall;(ii) a minimum average balance, say, Rs.5 lakh over the month. The first alternative is more restrictive as the average amount of cash held during the month must be above Rs.5 lakh by the amount of the transaction balance. From the firm's view point, this is obviously dead money. Under the second alternative the balance could fall to zero one day provided it was Rs.10 lakh some other day with the average working to Rs.5 lakh. of the four primary motives of the holding cash balances, the two most important are the transactions motive and the compensation motive. Business firms normally do not speculate and need not have speculative balances. The requirement of precautionary balances can be met out of short-term borrowings.

4.3 OBJECTIVES OF CASH MANAGEMENT:

The basic objectives of cash management are two-fold (a) to meet the cash disbursement needs (payment schedule); and (b) to minimize funds committed to cash balance. These are conflicting and mutually contradictory and the task of cash management is to reconcile them.

4.3.1 Meeting Payments Schedule

In the normal course of business, firms have to make payments of cash on a continuous and regular basis to suppliers of goods, employees and so on. At the same time, there is a constant inflow of cash through collections from debtors. Cash is, therefore, aptly described as the oil to lubricate the ever-turning wheels of business, without it the process grinds to a stop. A basic objective of cash management is to me the payment schedule, that is, to have sufficient cash to met the cash disbursement needs of a firm.

The importance of sufficient cash to meet the payment schedule can hardly be overemphasized. The advantages of adequate cash are : (i) it prevents insolvency or bankruptcy arising out of the inability of a firm to meet its obligations; (ii) the relationship with the bank is not strained; (iii) it helps in fostering good relations with trade creditors and suppliers of raw materials, as prompt payment may help their own cash management; (iv) a cash discount can be availed of if payment is made within the due date. For Illustration, a firm is entitled to 2 percent discount for a payment made within 10 days when the entire payment is to be made within 30 days. Since the net amount is due in 30 days, failure to take the discount means paying an extra 2 per cent for using the money for an additional 20 days. If a firm were to pay 2 per cent for every 20 days period over a year, there would be 18 such periods (360 days + 20 days). This represents an annual interest rate of 36 per cent. (v) it leads to a strong credit rating which enables the firm to purchase goods on favourable terms and to maintain its line of credit with banks and other sources of credit, (vi) to take advantage of favourable business opportunities that may be available periodically and finally, (vii) the firm can meet unanticipated cash expenditure with a minimum or strain during emergencies such as strikes fires or a new marketing campaign by competitors. Keeping large cash balances, however, implies a high cost. The advantage of prompt payment of cash can well be realized by **sufficient** and not **excessive** cash.

4.3.2 Minimising Funds Committed to cash Balances

The second objective of cash management is to minimize cash balance. In minimizing the cash balances, two conflicting aspects have to be reconciled. A high level of cash balances will, as shown above, ensure prompt payment together with all the advantages. But it also implies that large funds will remain idle, as cash is anon earning asst and the firm will have to forgo profits. A low level of cash balances, on the other hand, may mean failure to met the payment schedule. The aim of cash management therefore should be to have an optimal amount of cash balances.

Keeping in view these conflicting aspects of cash management, we propose to discuss the planning/determination of the need for cash balances. There are two aspects involved in cash planning : first an examination of those factors which have a bearing on the firm's required cash balance; second, a review of the approaches to achieve optimum cash balances.

4.4 FACTORS DETERMINING CASH NEEDS

The factors that determine the required cash balances are: (i) synchronization of cash flows, (ii) short costs, (iii) excess cash balance, (iv) procurement and management, and (v) uncertainty.

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4.4.1 Synchronization of Cash Flows

The need for maintaining cash balances arises from the non-synchronization of the inflows and outflows of cash, if the receipts and payments of cash perfectly coincide or balance each other, there would be no need for cash balances. The first consideration in determining the cash need is, therefore, the extent of non-synchronization of cash receipts and disbursements. For this purpose, the inflows and outflows have to be forecast over a period of time, depending upon the planning horizon which is typically a one-year period with each of the 12 months being a sub-period. The technique adopted is a cash budget. The preparation of a cash budget is discussed in the next section of this chapter. A property prepared budget will pinpoint the months/period when the firm will have an excess or a shortage of cash.

4.4.2 Short Costs

Another general factor to be considered in determining cash needs is the cost associated with a shortfall in the cash needs. The cash forecast presented in the cash budget would reveal periods of cash shortage. In addition, there may be some unexpected shortfall. Every shortage of cash whether expected or unexpected involves a cost depending upon the severity, duration and frequency of the shortfall and how the shortage is covered. Expenses incurred as a result of shortfall are called **short costs.** Cost included in the short costs are the following:

(i) **Transaction costs** associated with raising cash to tide over the shortage. This is usually the brokerageincu55red in relation to the sale of some short term near cash assets such as marketable securities;

(ii) **Borrowing costs** associated with borrowing to cover the shortage. These include items such as interest on loan, commitment charges and other expenses relating to the loan;

(iii) **Loss of cash discount,** that is, a substantial loss because of a temporary shortage of cash.

(iv) **Cost associated with deterioration of the credit rating** which is reflected in higher bank charges on loans, stoppage of supplies, demands for cash payment, refusal to sell, loss of image and the attendant decline in sales and profits.

(v) **Penalty rates** by banks to meet a shortfall in compensating balances.

4.4.3 Excess Cash Balance Costs:

The cost of having excessively large cash balances is known as the *excess cash balance cost.* If large funds are idle, the implication is that the firm has missed opportunities to invest those funds and has thereby lost interest which it would otherwise have earned. This loss of interest is primarily the excess cost.

4.4.4 Procurement and Management:

These are the costs associated with establishing and operating cash management staff and activities. They are generally fixed and are mainly accounted for by salary, storage handling of securities and so on.

4.4.5 Uncertainty and Cash Management:

Finally, the impact of uncertainty on cash management strategy is also relevant as cash flows cannot be predicted with complete accuracy. The first requirement is a precautionary cushion to cope with irregularities in cash flows, unexpected delays in collections and disbursements defaults and unexpected cash needs.

The impact of uncertainty on cash management can, however be mitigated through (i) improved forecasting of tax payments capital expenditure, dividends and soon and (ii) increased ability to borrow through overdraft facility.

4.5 DETERMINING CASH NEED

After the examination of the pertinent considerations and cost that determine cash needs, the next aspect relates to the determination of cash needs.

There are two approaches to derive an optimal cash balance, namely, (a) minimizing cost cash models and (b) cash budget.

4.6 CASH BUDGET: MANAGEMENT TOOL

A firm is well advised to hold adequate cash balances but should avoid excessive balances. The firm has, therefore, to assess its need for cash properly. The cash budget is probably the most important tool in cash management. It is a device to help a firm to plan and control the use of cash. It is a statement showing the estimated cash inflows and cash outflows over the planning horizon. In other words, the net cash position (surplus or deficiency) of a firm as it moves from one budgeting sub period to another is highlighted by the cash budget.

The various purposes of cash budgets are:

(i) to coordinate the timings of cash needs. It identifies the period(s) when there might either be a shortage of cash or a abnormally large cash requirements;

(ii) It pinpoints the period(s) when there is likely to be excess cash;

(iii) It enables a firm which has sufficient cash to take advantage of cash discounts on its accounts payable, to pay obligations when due, to formulate dividend policy, to plan financing of capital expansion and to help unify the production schedule during the year so that the firm can smooth out costly seasonal fluctuations, finally,

(iv) It helps to arrange needed funds on the most favourable terms and prevents the accumulation of excess funds. With adequate time to study his needs, the finance manager can select the best alternative, in contrast a firm which does not budget its cash requirements, may suddenly find itself short of funds. With pressing needs and little time to explore alternative avenues of financing, the management would be forced to accept the best terms offered in a difficult situation. These terms will not be as favourable, since the lack of planning indicates to the lender, that there is an organizational deficiency. The firm therefore represents a higher risk.

4.7 ELEMENTS/PREPARATION OF CASH BUDGET

Thus, the principal aim of the cash budget, as a tool to predict cash flows over a given period of time, is to ascertain whether at any point of time there is likely to be an excess or shortage of cash. The preparation of a cash budget involves various steps, these may be described as the elements of the cash budgeting system.

The first element of a cash budget is the selection of the period of time to be covered by the budget, it is referred to as the planning horizon. The planning horizon means the time span and the sub-periods within that time span over which the cash flows are to be projected. There was no fixed rule. The coverage of a cash budget will differ from firm to firm depending upon its nature and the degree of accuracy with which the estimate can be made. As a general rule, the period selected should be neither too long nor too short. If it is too long, it is likely that the estimates will be inaccurate. If, on the other hand, the time span is too small, many important events which lie just beyond the period cannot be accounted for and the work associated with the preparation of the budget becomes excessive.

The planning horizon of a cash budget should be determined in the light of the circumstances and requirements of a particular case. For instance, if the flows are expected to be stable and dependable, such a firm may prepare a cash budget covering a long period, say, a year and divide it into quarterly intervals. In the case of a firm whose flows are uncertain, a quarterly budget, divided into monthly intervals may be appropriate. Where flows are affected by seasonal variations, monthly budgets, subdivided on a weekly or even a daily basis may be necessary. the flows are subject to extreme fluctuations, even a daily budget may be called for. The idea behind subdividing the budgeting period into smaller intervals is to highlight the movement of cash from one sub period to another. The sub-division will provide information on the fluctuations in the cash reservoir level during the time span covered by the budget.

The second element of the cash budget is **the selection of the factors** that have bearing on cash flows. The items included in the cash budget are only dash items, non cash items such as depreciation and amortization are excluded. The facts that generate cash flows are generally divided, for

purposes of the construction of cash budget into two broad categories (a) operating and (b) financial This two-fold classification of cash budget items is based on their nature. While the former category includes cash, flows generated by the operations of the firms and are known as **Operating cash flows**. The latter consists of **Financial cash flows.**

4.8 OPERATING CASH FLOWS

The main operating factors/items which generate cash outflows and inflows over the time span of a cash budget are tabulated in Exhibit -1.

Exhibit-1 Operating Cash Flow items

Inflow/cash receipts	Outflow/Disbursements
1. Cash sales	1. Accounts payable/Payable payments
2. Collection of Accounts receivable	2. Purchase of raw materials.
3. Disposal of fixed assets	3. Wages and salary (payroll)
	4. Factory expenses
	5. Administrative and selling expenses
	6. Maintenance expenses
	7. Purchase of fixed assets

Among the operating factors affecting cash flows, are the collection of accounts receivable (inflows) and accounts payable (outflows). The terms of credit and the speed with which the customers pay would determine the lag between the creation of the accounts receivable and their collection. Also, discounts and allowances for early payments, returns from customers and bad debts affected cash inflows. Similarly, in the case of accounts payable relating to credit purchase cash outflow are affected by the purchase terms.

The calculation of the collection on credit sales and payments on credit purchases, is generally done in the form of a statement known as the worksheet.

Illustration 4.1

A firm sells goods on credit and allows a cash discount for payments made within 20 days. If the discount is not availed of the buyer must pay the full amount in 40 days. However, the firm finds that some of its customers delay payments up to 90 days. The experience has been that on 20 per cent of sales payment is made during the month in which the sale is

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made, on 70 per cent of the sales payment is made during the first month after sale and on 10 per cent of sales payment is made during the second month after sale.

The raw materials and other supplies required for production amount to 70 per cent of sales and are bought in the month before the firm expects to sell its finished products. Its purchase terms allow the firm to delay payment on its purchases for one month.

The credit sales of the firm are: (Rs. Lakhs)

May	10	August	30	November	20
June	10	September	40	December	10
July	20	October	20	January	10

Prepare a worksheet, showing the anticipated cash inflows on account of collection of receivables and disbursement of payables.

Solution:

The expected cash inflows through collection of receivables and the anticipated outflows on account of accounts payable are presented in Table 1 in the form of a worksheet.

Work Sheet (Rs.in Lakhs)

Particluars	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
1. Credit Sales	10	10	20	30	40	20	20	10	10
2. Collections:									
During month Of sale @ 20%	2	2	4	6	8	4	4	2	2
During 1st month after sale @ 70%	0	7	7	14	21	28	14	14	7
During 2nd month after sale @ 10%	0	0	1	1	2	3	4	2	2
Total Collections	2	9	12	21	31	35	22	18	11
3. Credit purchase									
@ 70% of next months sale	7	14	21	28	14	14	7	7	0

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Payment (1 month lag)	0	7	14	21	28	14	14	7	7
Total payments	0	7	14	21	28	14	14	7	7

4.9 FINANCIAL CASH FLOWS

The major financial factors/items affecting the generation of cash flows are explained below.

Financial Cash Flow Items

Cash Inflow/Receipts	Cash Outflow/Payments
1. Loans/Borrowings	1. Income-tax/Tax Payments
2. Sales of securities	2. Redemption of loan
3. Interest received	3. Repurchase of shares
4. Dividend received	4. Interest paid
5. Rent received	5. Dividends paid
6. Refund of tax	
7. Issue of new shares and securities	

Preparation of Cash Budget:

After the time span of the cash budget has been decided and pertinent operating and financial factors have been identified, the final step is the construction of the as budget. The preparation of a cash budget is illustrated in Illustration -4.2 and 4.3.

Illustration 4.2

A firm adopts a six-monthly time span, subdivided into monthly intervals for its cash budget.

(A) The following information is available in respect of its operations:

Particulars	Months					
	1	2	3	4	5	6
1. Sales	40	50	60	60	60	60

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2.	Purchases	1	1.50	2	2	2	1
3.	Direct labour	6	7	8	8	8	6
4.	Manufacturing overheads	13	13.50	14	14	14	13
5.	Administrative expenses	2	2	2	2	2	2
6.	Distribution expenses	2	3	4	4	4	2
7.	Raw materials (30 days credit)	14	15	16	16	16	15

(B) Assume the following financial flows during the period

(a) Inflows
1. Interest received in month 1 and month 6 Rs.1 lakh each
2. Dividend received during months 3 and 6, Rs.2 lakhs each
3. Sales of shares in month 6 Rs.160 lakhs

(b) Outflows
1. Interest paid during month 1, Rs.0.4 lakhs
2. Dividends paid during months 1 and 4 Rs.2 lakhs each
3. Instalment payment on machine in month 6, Rs. 20 lakhs
4. Repayment of loan in montjh 6, Rs.80 lakhs

(c) Assume that 10 per cent of each month's sales are for cash; the balance 90 Per cent are on credit. The terms and Credit experience of the firm are;

1. No cash discount
2. 1 per cent of credit sales is returned by the customers.
3. 1 per cent of total accounts receivable is bad debt;
4. 50 per cent of all accounts that are going to pay, do so within 30 days

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5. 100 percent of all accounts that are going to pay, do so within 60 days

Using the above information prepare a cash budget.

Solution -
The cash Budget is constructed as shown below.

Cash Budget for Six Months

Particluars	**1**	**2**	**3**	**4**	**5**	**6**
Sales	**40**	**50**	**60**	**60**	**60**	**60**
(A) Cash inflows						
1. cash sales (10% of Sales)	4.00	5.00	6.00	6.00	6.00	6.00
2. Receivables collection	0.00	17.64	39.69	48.51	52.92	52.92
3. Interest received	1.00	0.00	0.00	0.00	0.00	1.00
4. Dividends received	0.00	0.00	2.00	0.00	0.00	2.00
5. Sale of shares	0.00	0.00	0.00	0.00	0.00	160.00
Total (A)	**5.00**	**22.64**	**47.69**	**54.51**	**58.92**	**221.92**
(B) Cash outflows						
1. Purchases	1.00	1.50	2.00	2.00	2.00	1.00
2. Labour	6.00	7.00	8.00	8.00	8.00	6.00
3. Manufacturing overheads	13.00	13.50	14.00	14.00	14.00	13.00
4. Administrative expenses	2.00	2.00	2.00	2.00	2.00	2.00
5. Distribution charges	2.00	3.00	4.00	4.00	4.00	2.00

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6. Raw materials (30 days Credit)	0.00	14.00	15.00	16.00	16.00	16.00
7. Interest	0.40	0.00	0.00	0.00	0.00	0.00
8. Dividend paid	2.00	0.00	0.00	2.00	0.00	0.00
9. Instalment of machine	0.00	0.00	0.00	0.00	0.00	20.00
10. Repayment of loan	0.00	0.00	0.00	0.00	0.00	80.00
Total (B)	**26.40**	**41.00**	**45.00**	**48.00**	**46.00**	**140.00**
(C) Net Receipt or Payment (A - B)	**- 21.40**	**- 18.36**	**2.69**	**6.51**	**12.92**	**81.92**

It can be seen from the above calculations that the cash budget helps to reconcile the need for cash with the financing arrangement. For instance, in the first two months, the cash receipts fall below the disbursements and the firm obviously needs temporary financing which it will be able to pay in the subsequent months. In month 6, it has, in fact, excess cash for which temporary investment will have to be made until the funds can be employed in business.

Illustration 4.3

The following information is available in respect of a firm.

(A) **Balance Sheet as on March 31**

Liabilities	Amount	Assets		Amount
Accrued salaries	500	Cash		3000
Other liabilities	2500	Inventory		8000
Capital	65000	Other assets	70,000	
		Less : Depreciation	13,000	
				57000
	68,000			68,000

(B)	Sales Forecast		
April	10,000	July	50,000
May	20,000	August	40,000
June	30,000	September	20,000
		October	5,000

(C)	Salary Expenses Budget		
April	Rs.1,500	July	Rs. 4,000
May	2,000	August	3,000
June	2,500	September	2,000

(D) The firm is expected to operate on the following lines:

- Other expenses approximate 12 per cent of sales (paid in the same month)
- Sales will be 80 per cent dash and 20 percent credit. The all credit sales will be collected on the following month and no had debts are expected.
- All inventory purchases will be paid for during the month in which they are made.
- A basic inventory of Rs.2,000 (at cost) will be maintained. The firm will follow a policy of purchasing additional inventory each month to cover the following month's sale.
- A minimum cash balance of Rs.3,000 will be maintained.
- New orders for equipment amounting to s.20,000 scheduled for May1 delivery and Rs.10,000 for June 1 delivery have been made Payment will be made at the time of delivery.
- Accrued salaries and other liabilities will remain unchanged
- Gross profit margin is 40 per cent of sales.

Prepare a Cash budget for 6 months (April to September) Borrowings are made in thousands of rupees. Ignore interest.

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Solution:

Cash Budget (Amount in 000 rupees)

Particluars	Apr	May	Jun	Jul	Aug	Sep
Sales	**10**	**20**	**30**	**50**	**40**	**20**
(A) Cash inflows						
1. cash sales (80%)	8.00	16.00	24.00	40.00	32.00	16.00
2. Receivables collection	0.00	2.00	4.00	6.00	10.00	8.00
Total (A)	**8.00**	**18.00**	**28.00**	**46.00**	**42.00**	**24.00**
(B) Cash outflows						
1. Inventory	12.00	18.00	30.00	24.00	12.00	3.00
2. Salary	1.50	2.00	2.50	4.00	3.00	2.00
3. Expenses	1.20	2.40	3.60	6.00	4.60	2.40
4. Equipment	0.00	20.00	10.00	0.00	0.00	0.00
Total (B)	**14.70**	**42.40**	**46.10**	**34.00**	**19.60**	**7.40**
(C) Net Receipt or Payment (A - B)	**(6.70)**	**(24.40)**	**(18.10)**	**12.00**	**22.40**	**16.60**
Cumulative cash gain or Loss by end of month	**(6.70)**	**(31.10)**	**(49.20)**	**(37.20)**	**(14.80)**	**1.80**
Cumulative borrowing (month end)	**6.70**	**31.10**	**49.20**	**37.20**	**14.80**	**0.00**

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4.10 CASH MANAGEMENT MODELS

The cash budget, as a cash management tool, would throw on the net cash position of a firm. After knowing the cash position, the management should work out the basic strategies to be employed to manage its cash. The present section attempts to outline the basic strategies of cash management.

The broad cash management strategies are essentially related to the cash turnover process, that is the cash cycle together with the cash turnover. The **cash cycle** refers to the process by which cash is used to purchase materials from which are produced goods, which re then sold to customers, who later pay the bills. The firm receives cash from customers and the cycle repast itself. The **cash turnover** means the umber of times cash is used during each year. The cash cycle involves several steps along the way as funds flow from the firm's account, as shown in Exhibit 3.

Details of Cash Cycle

A	B	C	D	E	F	G	H	I

A	=	Materials ordered,	B	=	Materials received
C	=	Payments	D	=	Cheque clearance
E	=	Goods sold	F	=	Customer mails payments
G	=	Payment received	H	=	Cheques deposited,
I	=	Funds collected.			

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In addressing the issue of cash management strategies, we are concerned with the time periods involved in stages B, C, D and F, G. H. I. a firm has no control over the time involved between stages A and B. the lag between D and E is determined by the production process and inventory policy. The time period between stages E and F is determined by credit terms and the payments policy of customers.

The cash cycles and cash turnover are illustrated in the following Illustration:

Illustration 4.4

A firm which purchases raw materials on credit is required by the credit terms to make payments within 30dsays on its side, the firm allows its credit buyers to pay within 60 days. Its experience has been that it takes, on an average,35 days to pay its accounts payable and 70 days to collect its accounts receivable Moreover 85 days elapse between the purchase of

raw materials and the sale of finished goods, that is to say, the average age of inventory is 85 days. What is the firm's cash cycle? Also estimate the Cash turnover.

Solution:

The cash cycle of the firm can be calculated by finding the average number of days that elapse between the cash outflows associated with paying accounts payable and the cash inflows associated with collecting accounts receivable:

(i) Cash cycle = 85 days + 70 days – 35 days = 120 days

(ii) cash turn over = the assumed number of days in a year

divided by the cash cycle = 365/120 = 3

Minimum Operating Cash:

The higher the cash turnover, the less is the cash a firm requires. A firm should therefore, try to maximize the cash turnover. But it must maintain a minimum amount of operating cash balance so that it does not run out of cash. The minimum level of operating cash is determined by dividing the total operating annual outlays by the cash turnover rate. If, for Illustration, the total operating annual outlay of a firm is Rs.240 lakh, its minimum cash requirement is Rs.80 lakh (i.e. Rs.240 lakh + 3) . The operational implication of the minimum operating cash requirement is that if the firm has opening cash balance of Rs.80 lakh, it would be able to meet its obligation when they become due. In other words, it would not have to borrow anything. But the minimum operating cash involves a cost in terms the earnings forgone from investing it temporarily, that is to say, there is a opportunity cost. Assuming 10 per cent return on riskless investment (or retirement of a debt carrying 10 per cent interest), the cost of the minimum cash balance of Rs.60 lakhs works out to Rs.8 lakhs.

Cash Management strategies are intended to minimize the operating cash balance requirement. The basic strategies that can be employed to do the needful me as follows:

(a) Stretching Accounts Payable.

(b) Efficient Inventory – Production Management

(c) Speedy Collection of accounts Receivable, and

(d) Combined cash Management Strategies

We spelt out the implications of these strategies to the minimum cash balance and the associated cost with the underlying assumption that a firm should adopt such cash management strategies as we will lead to the minimizing of the operating casjh requirement. In other words, efficient cash management implies minimum cash balance consistent with the need to pay bills when they become due.

a. Stretching Accounts Payable:

One basic strategy of efficient cash management is to stretch the accounts payable. In other words, a firm should pay its accounts payable as late as possible without damaging its credit standing. It should, however take advantage of the cash discount available on prompt payment

If the firm, in our Illustration can stretch is accounts payable from the current level of 35 days to 45 days, its cash cycle will be 110 days (i.e. reduced by 10 days a from the original 120 days). The reduction in cash cycle by 10 days as a result of the stretching of the accounts payable by 10 days will increase the dash turn over from 3 (initially) to 3.27 (360 + 110). This will lead to a decrease in the minimum cash requirement from Rs.80 lakhs to Rs.73.40 lakh (Rs.240 lakh + 3.27). \that is, the requirement has been reduced by Rs.6.60 lakh. Assuming a 10 per cent rate of interest, there will be a saving in cost to the firm to the extent of Rs.0.66 lakh.

b. Efficient Inventory Production Management:

Another strategy is to increase the inventory turnover, avoiding stock outs, that is, shortage of stock. This can be done in the following ways

(1) Increasing the raw materials turnover by using more efficient inventory control techniques

(2)Decreasing the production cycle through better production planning, scheduling and control techniques, it will lead to an increase in the work in progress inventory turnover.

(3)Increasing the finished goods turn over through better forecasting of demand and a better planning of production.

Assume that the firm in our Illustration is able to reduce the average age of its inventory from 85 to 70 that is by 15 days. As a result, the cash cycle will decline by 15 days from 120 days to 105 days. The cash turn over will increase to 3.43 (360 + 105) from the original level of 3. The effect of an increase in the cash turn over will be to reduce the minimum cash requirement from Rs.80 lakh to Rs.70 lakh (Rs.240 lakh+ 3.43). the saving in cost on Rs.10 lakh will Rs.1 lakh (Rs.10 lakh x 0.10). thus, efficient inventory and production management causes a decline in the operating cash requirement and hence, a saving in cash operating cost.

c. Speeding Collection of Accounts Receivable:

Yet another strategy for efficient cash management is to collect accounts receivable as quickly as possible without losing future sales because of high pressure collection techniques. The average collection period of receivables can be reduced by charges in (i) credit terms, (ii) credit standards and (iii) collection policies. These are elaborated in the next chapter. In brief, **credit standards** represent the criteria for determining to whom credit should be extended. The collection policies determine the effort put forth to collect accounts receivable promptly.

If the firm in our above Illustration manages to reduce the average age of its accounts receivable from the current level of 70 days to 60 days, the cash cycle will be reduced to 100 days from 120 days (decline by 20 days). The cash turn over will increase in consequence to 3.60 (360 + 100) from the original level of 34. the operating cash requirement will fall from rs.80 lakhs to approximately Rs.66.67 lakh (Rs.240 + 3.60). the reduction in cash balance of aboutnRs.233.33 lakh will lead to a saving in cost amounting to Rs.1.33 lakh (o.10 x Rs.13.33 lakh). Thus a reduction in the average collection period by 20 days releases funds equivalent to rs.13.33 lakh and leads to saving in cash operating cost of Rs.1.33 lakh)

d. Combined Cash Management Strategies

We have shown the effect of individual strategies on the efficiency of cash management. Each one of them has a favourable effect on the operating cash requirement. We now illustrate their combined effect, as firm will be well advised to use a combination of these strategies.

Assume the firm in our Illustration, simultaneously (i) increases the average accounts payable by 10days; (ii) reduces the average age of inventory by 15 days; (iii) speeds up the collection of accounts receivable by 20 days. Now, the cash cycle will be 75 days (120 days – 10 days – 15 days – 20 days); the cash turnover will increase to 4.8 (360 + 75), the minimum operating cash requirement will go down to Rw.50 lakh, that is a reduction of Rs.30 lakh, assuming a 10 percent rate of interest the saving in cash 0perating cost will be Rs.3 lakh.

The foregoing discussion clearly shows that the three basic strategies of cash management, related to (1) accounts payable, (2) inventory and (3) accounts receivable, lead to a reduction in the cash balance. But they imply certain problems for the management. First, if the accounts payable are postponed too long, the credit standing of the firm may be adversely affected. Secondly, a low level of inventory may lead to a stoppage of production as sufficient raw materials may not be available for uninterrupted production, of the firm may be short or enough stock to met the demand for its product that is **stock out** finally restrictive credit standards credit terms and collection policies may jeopardize sales. These implications should be constantly kept in view while working out cash management strategies.

4.11 CASH MANAGEMENT TECHNIQUES/PROCESSES

The basic strategies of cash management have been outlines in the preceding section. It has been shown that the strategic aspects of efficient cash management are : (i) efficient inventory management (ii) speedy collection of accounts receivable and (iii) delaying payments on accounts payable. There are some specific techniques and process for speedy collection of receivables from customers and slowing disbursement.

(i) Speedy Cash Collections:

In managing cash efficiently, the dash inflow process can be accelerated through systematic planning and refined techniques. There are two broad approaches to do this. In the first place, the customers should be encouraged to pay as quickly as possible. Secondly, the payment from customers should be converted into cash without any delay.

(ii) Prompt Payment by Customers:

One way to ensure prompt payment by customers is prompt billing. What the customer has to pay and the period of payment should be notified accurately and in advance. The use of mechanical derives for billing along with the enclosure of self-addressed return envelope will speed up payment by customers, is the practice of offering cash discounts. The availability of discount implies considerable saving to the Customers to avail of the facility the customers would be eager to make payment early.

Early Conversion of Payments into Cash Once the customer makes the payment by issuing a cheque in favour of the firm, the collection can be expedited by prompt encashment of the cheque. There is lag between the time a cheque is prepared and mailed by the customer and the time the funds are included in the cash reserve of the firm.

The collection of accounts receivable can be considerably accelerated by reducing transit, processing and collection time. An important cash management technique is reduction in deposit float. This is possible if a firm adopts a policy of **decentralized collections.** we discuss below some of the important processes that ensure decentralised collection so as to reduce (i) the amount of time that elapses between the mailing of a payment by a customer and (ii) the point the funds become available to the firm for use. The principal methods of establishing a decentralised collection network are (a) Concentration Banking and (b) Lock box System.

(a) Concentration Banking:

In this system of decentralized collection of accounts receivable, large firms which have a large number of branches at different places, select some of the strategically located branches as collection centres for receiving p[payment from customers Instead of all the payments being collected at the head office of the firm, the cheques for a certain geographical area are collected at a specified local collection centre. Under this arrangement, the customers are required to send their payments (cheque) to the collection centre covering the area in which they live and these are deposited in the local account of the concerned collection centre, after meeting local expenses, if any. Funds beyond a predetermined minimum are transferred daily to a central or disbursing of concentration bank or account. A concentration bank is one with which the firm has a major account usually a disbursement account. Hence, this arrangement is referred to as concentration banking.

Concentration banking, as a system of decentralized billing and multiple collection points, is a useful technique to expedite the collection of

accounts receivable. It reduces the time needed to the collection process by reducing the mailing time. Since the collection centres are near the customers, the time involved in sending the bill to the customer is reduced. Moreover, the time lag between the dispatch of the cheque by the customer and its receipt by the firm is also reduced. Mailing time is saved both in respect of sending the bill to the customers as well as in the receipt of payment. The second reason why deposit float is reduced by concentration banking is that the banks of the firm as well as the customers may be in a close proximity. Thus, the arrangement of multiple collection centres with concentration banking results in a saving of time in both mailing and clearance of customer payments and leads to a reduction in the operating cash requirements. Another advantage is that concentration permits the firm to 'store' its cash more efficiently. This is so mainly because by pooling funds for disbursement in a single account, the aggregate requirement for cash balance is lower than it would be if balances are maintained at each branch office.

(b) Lock-Box System:

The concentration banking arrangement is instrumental in reducing the time involved in mailing and collection. But with this system of collection of accounts receivable, processing for purpose of internal accounting is involved, that is, some time elapses before a cheque is deposited by the local collection centre in its account. The lock box system takes care of this kind of problem, apart from effecting ec0nomy in mailing and clearance times. Under this arrangement, firms hire a post office lock box at important collection centres. The customers are required to remit payments to the post office lock box. The local banks of the firm, at the respective places, are authorized to open the box and pick up the remittances (cheques) received from the customers. Usually, the authorized banks pick up the cheques several times a day and deposit them in the firm's accounts. After crediting the account of the firm, the banks send a deposit slip along with the list of payments and other enclosures if any, to the firm by way of proof and record of the collection.

Thus, the lock box system is like concentration banking in that the collection is decentralized and is done at the branch level. But they differ in one very important respect. While the custome sends the cheques under the concentration banking arrangement to the collection centre, he sends them to a post office box under the lock box system. The cheques are directly received by the bank which empties the box and not from the firm or its local branch.

In a way, the lock box arrangement is an improvement over the concentration banking system. Its superiority arises from the fact that one step-in the collection process is eliminated with the use of lock box, the receipt and deposit of cheques by the firm. In other words, the processing time within the firm before depositing a cheque in the bank is eliminated. Also, some extra saving 9n mailing timing is provided by the lock box system as the cheques received in the post office box are not delivered

either by the post office or the firm itself to the bank, rather, the bank itself picks them up oat the post office.

Thus, the lock box system as a method of collection of receivables, has a two fold advantage : (i) the bank performs the clerical task of handling the remittances prior to deposits services which the bank may be able to perform at lower cost (ii) the process of collection through the banking system begins immediately upon the receipt of the cheque/remittance and does not have to wait until the firm completes its processing for internal accounting purposes. In terms of the steps involves in the cash cycle, as shown in Exhibit 3. GH and HI would take place sim8ultaneously. As a result, the time lag between payment by a customer and the availability of funds to the firm for use would be reduced and thereby the collection of receivables would be accelerated.

Although the use of concentration banking and lock box systems accelerate the collection of receivables they involve a cost. While in the case of the former, the cost is in terms of the maintenance of multiple collection centres, compensation to the hank for services represents the cost associated with the latter. the justification for the use or otherwise of these special cash management techniques would be based on a comparison of the cost with the return generated on the released funds. If the income exceeds the cost the system is profitable and should be used, otherwise not. For this reason, these techniques can be pressed into service only by large firms which receive a large number of cheques from a wide geographical area.

Illustration 4.5

A firm uses a continuous billing system that results in an average daily receipt of Rs.40,00,000. It is contemplating the institution of concentration banking, instead of the current system of centralized billing and collection. It is estimated that such a system would reduce the collection period of accounts receivable by 2 days.

Concentration banking would cost Rs.75,000 annually and 8 per cent can be earned by the firm on its investments. It is also found that a lock box system could reduce its over all collection time by four days and could cost annually Rs.1,20,000

(i) How much cash would be freed by lock box system?

(ii) How much money can be saved due to reduction in the collection period by 2 days? should the firm institute the concentration banking system?

(iii) How much cash would be freed by lock box system, which is better?

(iv) Between concentration banking and lock box system, which is better?

Solution:

(i) Cash released by the concentration banking system

= Rs.40,00,000 x 2 days = Rs.80,00,000

(ii) Saving = 0.08 x Rs.80,00,000 = Rs.6,40,000

The firm should institute the concentration banking system. It costs only Rs.75,000 while the savings expected areras.Rs.6,40,000

(iii) Cash released by the lock box system

= Rs.40,00,000 x 4 days = Rs.1,60,000

(iv) Saving in lock box system = Rs.1,60,000 = Rs.12,80,000

Lock box system is better. Its net savings rs.11,60,000 (Rs.12.80,000 – Rs.1,20,000) are higher than that of concentration banking.

(iii) Slowing Disbursements:

Apart from speedy collection of accounts receivable, The operating cash requirement can be reduced by slow disbursements of accounts payable. In fact, slow disbursements represent a source of funds requiring no interest payments. There are several techniques to delay payment of accounts payable namely (a) avoidance of early payments (b) centralized disbursements (c) floats and (d) accruals.

(a) Avoidance of Early Payments:

One way to delay payments is to avoid early payments. According to the terms of credit, a firm is a required to make a payment within a stipulated period. It entitles a firm to cash discounts. If, however, payments are delayed beyond the due date, the credit standing may be adversely affected so that the firms would fid it difficult to secure trade credit later. But if the firm pays its accounts payable before the due date it has no special advantages. Thus, a firm would be well advised not to make payments early, that is, before the due date.

(b) Centralised Disbursements:

Another method to slow down disbursements is to have centralized disbursements. All the payments should be made by the head office from a centralized disbursement account. Such an arrangement would enable a firm to delay payments and conserve ash for several reasons. Firstly, it involves increase in the transit time. The remittance from the head office to the customers in distant places would involve more mailing time than a decentralised payment by the local branch. The second reason for reduction in operating cash requirement is that since the firm has a centralized bank account, a relatively smaller total cash balance will be needed. In the case of a decentralised arrangement a minimum cash balance will have to be maintained at each branch which will add to large operating cash balance. Finally, schedules can be tightly controlled and disbursements made exactly on the right day.

(c) Float

A very important technique of slow disbursements is float. The term float refers to the amount of money tied up in cheques that have been written but have yet to be collected and encashed. Alternatively, float represents the difference between the bank balance and book balance of cash of a firm. The difference between the balance as shown by the firm's record and the actual bank balance is due to transit and processing delays. There is a time lag between the issue of a cheque by the firm and its presentation to its bank by the customer's bank for payment. The implication is that although the cheque has been issued cash would be required later when the cheque is presented for encashment Therefore, a firm can send remittances although it does not have cash in its bank at the time of issuance of the cheque. Meanwhile, funds can be arranged to make payment when the cheque is presented for collection after a few days. Float used in this sense is called as cheque kiting. There are two ways of doing it (i) paying from a distant bank (ii) scientific cheque cashing analysis.

(i) Paying from a Distant Bank:

The firm may issue a cheque on banks away from the creditor's bank. This would involve relatively longer transit time for the creditor's bank to get payment and, thus, enable the firm to use its funds longer.

(ii) Cheque-encashment Analysis:

Another way to make use of float is to analyse, on the basis of past experience, the time lag in the issue of cheques and their encashment. For instance, cheques issued to pay wages and salary may not be encashed immediately, it may be spread over a few days, say, 25 per cent on one day, 50 per cent on the second day and the balance on the third day. It would mean that the firm should keep in the bank not the entire amount of a payroll but only a fraction represented by the actual withdrawal each day. This strategy would enable the firm to save operating cash.

(d) **Accruals**

Finally, a potential tool for stretching accounts payable is accruals which are defined as current liabilities that represent service or goods received by a firm but not yet paid for. For instance, payroll, that is, remuneration to employees who render service in advance and receive payment later. In a way, they extend credit to the firm for a period at the end of which they are paid say, a week or a month. The longer the period after which payment is made, the greater is the amount of free financing consequently and the smaller is the amount of cash balances required. Thus, less frequent payrolls, that is, weekly as compared to monthly are an important source of accrual. They can be manipulated to slow down disbursements. Other Illustrations of accrual are rent to lessors and taxes to government. But these can be utilized only to a limited extent as there are legal constraints beyond which such payments cannot be extended.

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4.12 MARKETABLE SECURITIES:

This section presents a brief description of the marketable securities. Attention is focused on the meaning and characteristics of marketable securities the general selection criterion and the basis types of such securities.

4.12.1 Meaning and characteristics:

Once the optimum level of cash balance of a firm has been determined the residual of its liquid assets is invested in marketable securities. Such securities are short-term investment instruments to obtain a return on temporarily idle funds. In other words, they are securities which can be converted into cash in a short period of time typically a few days. The basic characteristics of marketable securities affect the degree of their marketability/liquidity. To be liquid a security must have two basic characteristics; a ready market and safety of principal. Ready marketability minimize the amount of time required to convert a security into cash. A ready market should have both breadth in the sense of a large number of participants scattered over a wide geographical area as well as depth as determined by its ability to absorb the purchase/sale of large amounts of securities.

The second determinant of liquidity is that there should be little or no loss in the value of a marketable security over time. Only those securities that an be easily converted into cash without any reduction in the principal amount qualify for short-term investments. A firm would be better off leaving the balances in cash if the alternative were to risk a significant reduction in principal.

4.12.2 Selection Criterion:

A major decision confronting the financial managers involves the determination of the mix of cash and marketable securities. Some of the quantitative models for determining the optimum amounts of marketable securities to hold in certain circumstances have been outlines in an earlier section. In general, the choice of the mix is based on a trade off between the opportunity to earn a return on idle funds (cash) during the holding period, and the brokerage costs associated with the purchase and sale of marketable securities. For Illustration, take the case of a firm paying Rs.350 as brokerage costs to purchase and sell Rs.45,000 worth of marketable securities yielding an annual return of 8 per cent and held for one month. The interest earned on the securities works out a Rs.300 (1/12 x -08 x Rs.45,000). Since this amount is less than the cost of the transaction (Rs.350) it is not advisable for the firm to make the investments. This trade off between interest returns and brokerage costs is a key factor in determining what proportion of liquid assts should be held in the form of marketable securities.

There are three motives for maintaining liquidity (cash as well as marketable securities) and, therefore, for holding marketable securities, transaction motive, safety/precautionary motive and speculative motive.

Each motive is based on the premise that a firm should attempt to earn a return on temporarily idle funds. The type of marketable security purchased will depe3nd on the motive for the purchase. An assessment of certain criteria can provide the financial manager with a useful framework for selecting a proper marketable securities mix.

These considerations include evaluation of (i) financial risk (ii) interest rate risk (iii) taxability (iv) liquidity and (v) yield among different financial assets.

(i) Financial/Default Risk:

It refers to the uncertainty of expected returns from a security attributable to possible changes in the financial capacity of the security issuer to make future payments to the security owner. If the change of default on the terms of the investment is high (low) then the financial risk is said to be high (low). As the marketable securities portfolio is designed to provide a return on funds that would be otherwise tied up in ideal cash held for transaction or precautionary purposes, the financial manager will not usually be willing to assume such financial/default risk in the hope of greater return within the make up of the portfolio.

(ii) Interest Rate Risk:

The uncertainty that is associated with the expected returns from a financial instrument attributable to changes in interest rate is known as interest rate risk. Of particular concern to the corporate financial manager is the price volatility associated with instruments that have long, as opposed to short terms to maturity.

If prevailing interest rates rise compared with the date of purchase, the market price of the securities will fall to bring their yield to maturity in line with what financial managers could obtain by buying a new issue of a given instrument, for instance, treasury bills. The longer the maturity of the instrument t, the larger will be the fall in prices. To hedge against the price volatility caused by interest rat3e risk, the market securities portfolio will tend to be4 composed of instruments that mature over short periods.

(iii) Taxability:

Another factor affecting observed difference in market yields is the differential impact of taxes. Securities income on which is tax exempt sell in the market at lower yields to maturity than other securities 0f the same maturity. A differential impact on yields arises also because interest income is taxes at the ordinary tax rate while capital gains are taxes at a lower rate. As a result fixed interest securities that sell at discount because of low coupon rate in relation to the prevailing yields are attractive to taxable investors. The reason is that part of the yield to maturity is a capital gain. Owing to the desirability of discount on low interest fixed income securities their yield to maturity tends to be lower than the yield on comparable securities with higher coupon rates. The greater the discount the greater is the capital gains attraction and the loser is its yield

relative to what it would be if the coupon rate were such that the security was sold at par.

(iv) Liquidity:

With reference to marketable securities portfolio, liquidity refers to the ability to trans form a security into ash. Should an unforeseen event require that a significant amount of cash be immediately available, a sizeable portion of the portfolio might have to be sold. The financial manager will want the cash quickly and will not want to accept a large price reduction in order to convert the securities. Thus, in the formulation of preferences for the inclusion of particular instruments in the portfolio, consideration will be given to (i) the time period needed to sell the security and (ii) the likelihood that the security can be sold at or near its prevailing market price. The later element, here means that 'thin' market, where relatively few transactions take place or where traders are accomplished only with large price changes between transaction, should be avoided.

(v) Yield:

The final selection criterion is the yields that are available on the different financial assets suitable for inclusion in the marketable/near cash portfolio. All the four factors factors listed above, financial risk, interest rate risk liquidity and taxability influence the available yields on financial instruments. Therefore the yield criterion involves a weighing of the risks and benefits inherent in these facts. If a given risk is assumed, such as lack of liquidity, then a higher yield may be expected on the instrument lacking the liquidity characteristics.

4.12.3 Marketable Security Alternatives:

We describe below briefly the more prominent marketable/near cash securities available for investment. Our concern is with money market instruments.

(i) Treasury Bills:

There are obligations of the government. They are sold on a discount basis. The investor does not receive an actual interest payment. The return is the difference between the purchase price and the face (par) value of the bill.

The treasury bills are issued only in bearer form. They are purchased, therefore, without the investors' name upon them. This attribute makes them easily transferable from one investor to another. Ay active secondary market exists for these bills. The secondary market for bills not only makes them highly liquid but also allows purchase of bills with very short maturities. As the bills have the full financial backing of the government, they are, for all practical purposes, risk free. The negligible financial risk and the big degree of liquidity makes their yield lower than those on the other marketable securities. Due to their virtually risk free

nature and because of active secondary market for them, treasury bills are one of the most popular marketable securities even though the yield on them is loser.

(ii) Negotiable Certificates of Deposit (CDs):

These are marketable receipts for funds that have been deposited in a bank for a fixed period of time. The deposited funds earn a fixed rate of interest. The denomination and maturities are tailored to the investors' need. The CDs are offered by banks on a basis different from treasury bills, that is, they are not sold at a discount . Rather when the certificates mature, the owner receives the full amount deposited plus the earned interest. A secondary market exists for the CDs. While CDs may be issued in either registered or bearer form the latter facilitates transactions in the secondary market and thus, is the most common. The default risk is that of the bank failure, a possibility that is low in most cases.

(iii) Commercial Paper:

It refers to short term unsecured promissory note sold by large business firms to raise cash. AS they arte unsecured the issuing side of the market is dominated by large companies which typically maintain sound credit ratings. Commercial papers (CPs) can be sold either directly or through dealers. Companies with high credit rating can sell directly to investors. The denominations in which they can be bought vary over a wide range. They can be purchased similarly with varying maturities. These papers are generally sold on discount basis in bearer form although at times commercial papers can be issued carrying interest and made payable to the order of the investor. For all practical purposes, there is no active trading in secondary market for commercial paper although direct sellers of CPs often repurchase it on request. This feature distinguished CPs from all of the previously discussed short term investment vehicles. When, therefore a financial manager evaluates these for possible inclusion in marketable securities portfolio he should plan to hold it to maturity. Owing to its lack of marketability. CPs provide a yield advantage over other near cash assets of comparable maturity.

(iv) Bankers Acceptances:

These are drafts(order to pay) drawn on a specific bank by an exporter in order to obtain payment for goods he has shipped to a customer who maintains an account with that specific bank. They can also be used in financing domestic trade. The draft guarantee payment by the accepting bank at a specific point of time. The Seller who hold such acceptance may sell it at a discount to get immediate funds. Thus, the acceptance becomes a marketable security. Since acceptances are used to finance the acquisition of goods by one –arty, the document is not issued in specialized denominations, its size/denomination is determined by the cost of goods being purchased. They serve a wide range of maturities and are sold on a discount basis, payable to the bearer. A secondary market for the acceptance of large banks does exist. Owing to their greater financial risk and lesser liquidity, acceptances provide investors a yield advantage

over treasury bills of like maturity. In fact, the acceptance of major banks are a very safe investment, making the yield advantages over treasury bills worth looking for marketable securities portfolio.

(v) Repurchase (Repo) Agreements:

These are legal contracts that involve the actual sale of securities by a borrower to the lender with a commitment on the part of the former to repurchase the securities at the current price; us a stated interest charge. The securities involved are government securities and other money market instruments. The borrower is either a financial institution or security dealer.

There are two major reasons why a firm with excess cash prefers to buy repurchase agreements rather than a marketable security. First, the original maturities of the instrument being sold can, in effect, be adjusted to suit the particular needs of the investing firm. Therefore, funds available for a very short period, that is, one/two days can be employed to earn a return. Closely related to the first is the second reason, namely, since the contract price of the securities that make up the arrangement is fixed for the duration of the transaction, the firm buying the repurchase agreement is protected against market fluctuations throughout the contract period. This makes it a sound alternative investment for funds that are surplus for only short periods.

(vi) Units:

The units of mutual funds offer a reasonably convenient alternative avenue for investing surplus liquidity as (i) there is a very active secondary market for them, (ii) the income from units is tax exempt up to a specified amount and (iii) the units appreciate in a fairly predictable manner.

(vii) Intercorporate Deposits:

Intercorporate deposits, that is, short-term deposits with other companies is a fairly attractive form of investment of short term funds in terms of rate of return which currently ranges between 12 and 15 per cent. However, apart from the fact that one month's time is required to convert them into cash, inter corporate deposits suffer from high degree of risk.

(viii) Bills Discounting:

Surplus funds may be deployed to purchase/discount bills. Bills of exchange are drawn by seller (drawer) on the buyer (drawee) for the value of goods delivered to him. During the pendency of the hill i9fthe seller is in need of funds, he may get it discounted. On maturity, the bill should be presented to the drawee for payment. A bill of exchange is a self liquidating instrument. Bill discounting is superior to intercorporate deposits for investing surplus funds. While parking surplus funds in bills discounting, it should be ensured that the bills are trade bills arising out of genuine commercial transaction and, as far as possible they should be

backed by letter of credit/acceptance by banks to ensure absolute safety of funds.

(ix) Money Market Mutual Funds/Liquid Funds:

are professionally managed portfolios of marketable securities. They provide instant liquidity. Due to high liquidity, competitive yields and low transactions, these funds have achieved significant growth in size and popularity in recent years.

Illustration 4.6

The following information is available in respect of a trading firm.

(i) On an average debtor are collected after 45 days inventories have an average holding period of 75 days and creditors payment period on an average is 30 days.

(ii) The firm spends a total of Rs.120 lakh annually at a constant rate.

(iii) It can earn 10 per cent on investments.

From the above information compute: (a) the cash cycle and cash turnover (b) minimum amounts of cash to be maintained to meet payments as they become due(c) savings by reducing the average inventory holding period by 30 days.

Solution

(a) (i) Cash cycle = 45 days + 75 days – 30days = 90 days (3 months)
(ii) Cash turnover = 12 months (360 days) 3 months (90 days) = 4

(b) The firm spends a total of Rs.120 lakh annually at a constant rate

(c) Cash cycle = 45 days + 45 days – 30 days = 60 days (2 months)
Cash turnover = 12 months (360 days)/2 months (60 days) = 6
Minimum operating cash = Rs.120 lakh/6 = Rs.20 lakh
Reduction in investments = Rs.30 lakh – Rs.20 lakh = Rs.10 lakh
Savings = 0.10 x Rs.10 lak = Rs.1 lakh

Illustration 4.7

A firm has been offered, a cash management service by a bank for Rs.1,00,000 per year. It is estimated that such a service would not only eliminate "excess" cash on deposits (Rs.8,00,000) but also reduce its administration and other costs to the tune of Rs.5,000 per month. Assuming the cost of capital of 15 percent, is it worthwhile for the firm to engage the cash management service?

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Solution:

Benefits (annual)	
Savings in interest(Rs.8,00,000 x 0.15)	Rs.1,20,000
Reducti0n in administration and other costs (Rs.5,000 x 120)	Rs. 60,000
Total	Rs.1,80,000
Less: Cost (annual)	
Bank service charges	Rs.1,00,000
Net annual benefits	Rs. 80,000

Recommendation: It is worthwhile to engage the bank services.

Illustration 4.8

METRIT Industries feels a lock box system can shorten its accounts receivable collection period by 3 days credit sales are estimated at Rs.365 lakh per year billed on a continuous basis. The firm's opportunity cost of funds is `15 per cent. The cost of lock box system is Rs.50,000

(a) Will you advise "METRIT" to go for lock box system?

(b) Will your answer be different if accounts receivable collection period is reduced by 5 days?

Solution

(a) Cash released by lock box system (Rs.365 lakh/365 days = Rs.Rs.1 lakh x 3 days	Rs.3,00,000
(i) Savings (Rs.3 lakh x 0.15)	45,000
(ii) Less: Cost of lock box system	(50,000)
Net loss (i-ii)	(5,000)

The firm is advised not to go for the lock box system

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(b)	Cash released Rs.1 lakh x 5 days	Rs.5,00,000
	(i) Savings (Rs.5 lakh x 0.15)	75,000
	(ii) Less : Cost of lock box system	(50,000)
	Net savings (i – ii)	25,000

The firm should go for the lock box system.

Illustration 4.9

EXCEL Industries sells ts products through widely dispersed distributors in Norhern India. It currently takes on an average 8 days for cash receipt cheques to become available to the firm from the data they are mailed. The firm is contemplating the institution of c0ncentration banking to reduce this period. It is estimated that such a system would reduce the collection period of accounts receivable by 3 days. The daily cheque receipts currently average Rs.10,00,000.

The concentration banking would cost rs.1,50,000 annually and the cost of funds is 15 per cent.

(a) Advise EXCEL whether it should introduce concentration banking system.

(b) Will your answer be different, if it is estimated that a lock box system can reduce the collection time by 45 days and its annual cost would be Rs.2,00,000?

Solution

(a)	Cash released by concentration banking system (Rs.10 lakh x 3 = Rs.30 lakh)	
	(i) Savings (Rs.30 lakh X 0.15)	Rs,4,50,000
	(ii) Less: Costs	(1,50,000)
	Net savings (i – ii)	3,00,000

The firm should introduce concentration banking system

(b)	cash released by lock system (Rs.10 lakh x 4 = Rs..40 lakh)	
	(i) Savings (Rs.40 lakh x 0.15)	6,00,000
	(ii) Less : Costs	2,00,000
	Net Savings (i – ii)	4,00,000

The lock box system is better

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Illustration 4.10

The following results are expected by AMERSONS Ltd. by quarters next year, in thousands of rupees.

Particulars	Quarter			
	1	2	3	4
Sales	7,500	10,500	18,000	10,500
Cash payments				
Production costs	7,000	10,000	8,000	8,500
Selling administrative And other costs	1,000	2,000	2,900	1,600
Purchases of plant and Other fixed assets	100	1,100	2,100	2,100

The debtors at the end of a quarter are one third of sales for the quarter. The opening balance of debtors is Rs.30,00,000 cash on hand at the beginning of the year is Rs.6,50,000 and the desired minimum balance is Rs.5,00,000. Borrowings are made at the beginning of quarters in which the need will occur in multiplies of Rs.10,000 and are repaid at the end of quarters Interest charges maybe ignored. You are required to prepare:

(a) a cash budget by quarters for the year and

(b) state the amount of loan outstanding at the end of the year

Solution

	1	2	3	4	Total
A) Cash inflows					
Collection from debtors					
(i) From prior quarter					
(1/3 of sales)	2500	3500	6000	3500	15500
(ii) From current quarter					
(2/3 of sales)	5000	7000	12000	7000	31000

Total	7500	10500	18000	10500	46500
(B) Cash outflows					
Production costs	7000	10000	8000	8500	33500
Selling, administration and other costs	1000	2000	2900	1600	7500
Plant and other fixed Assets purchased	100	1100	2100	2100	5400
Total	8100	13100	13000	12200	46400
(C) Surplus (deficiency)	-600	-2600	5000	-1700	100
Beginning balance	650	500	500	2450	650
Ending balance (indicated)	50	-2100	5500	750	750
Borrowings required	450	2600	0	0	3050
(deficiency + min cash required)					
Repayment made	0	0	3050	0	3050
(balance – min cash required)					
Ending balance (actually now Estimated)	500	500	2450	750	750

(b) Loan outstanding = Rs.30,50,000 – Rs.30,50,000 = Nil

Illustration 4.11

From the following information prepare cash budget of a business firm for the month of April

(a) The firm makes 20 per cent cash sales. Credit sales are collected 40,30 and 25 per cent in the month of sales month after and second

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month after sales respectively. The remaining 5 per cent becomes bad debts.

(b) The firm has a policy of buying enough goods each month to maintain its inventory at two- and one-half times the following month's budgeted sales.

(c) The firm is enti5tled to 2 per cent discount on all its purchases if bills are paid within 15 days and the firm avails of all such discounts. Monthly purchases are made in two equal lots on fortnightly basis.

(d) Cost of goods sold, without considering the 2 per cent discount, is 50 per cent of selling prices. The firm records inventory net of discount.

(e) Other data is :

	Sales
January (actual)	Rs.1,00,000
February (actual)	1,20,000
March (actual)	1,50,000
April (budgeted)	1,70,000
May (budgeted)	1,40,000

Inventory on March 31,	Rs.2,25,400
Cash on March 31,	Rs.30,000
Gross purchasers in March	Rs.1,00,000

Selling, general and administrative expenses budgeted for April Rs.45,000 (includes rs.10,000 depreciation)

Solution

Cash Budget for the month of April

Particulars	**Amount**
(a) Cash inflows	
Balance in the beginning April 1	Rs.30,000
Collection from sales	
Cash sales 10.20 x Rs.1,70,000	34,000
Collection from debtors :	
For February sales Rs.(0.25 x Rs.96,000)	24,000
For March sales (0.30 x 1,20,000)	36,000
For April sales (0.40 x 1,36,000)	54,400
Total	1,78,400

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(b) Cash outflows

Payment for purchase	
March (Rs.1,00,000 x 0.98 x ½)	49,000
April (Rs.29,400 x ½) (see purchase budget)	14,700
Selling general and administrative expenses (Rs.45,000 – Rs.10,000)	35,000
Total	**98,700**

(c) Budgeted cash balance at end of April (a – b)

Working notes

Particular budget (April)	Gross	Net
Desired ending inventory-gross (Rs.1,40,000 x 0.50 x 2.5)	Rs.1,75,000	Rs.1,71,500
Add: Cost of sales in April-gross (Rs.1,70,000 x 0.50)	85,000	83,300
Total requirements	2,60,000	2,54,800
Less Beginning inventory – gross (Rs.2,25,400 x 100/98)	2,30,000	2,25,400
Required purchases	30,000	29,400

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5

BASIC PRINCIPLES OF COST ACCOUNTING

Unit Structure :

5.0 Objectives

5.1 Introduction

5.2 Meaning of Cost Accounting

5.3 Definition of Cost Accounting

5.4 Scope of Cost Accounting

5.5 Difference Between Financial Accounting and Cost Accounting

5.6 Concept of Cost Centre and Cost Unit

5.7 Classification of Cost

5.8 Determination of Total Cost

5.9 Elements of Cost

5.10 Cost Sheet / Statement of Cost

5.0 OBJECTIVES

- To Introduce the topic
- To Know about the Meaning and Definitions of Cost Accounting
- To Explain the relationship between Financial Accounting and Cost Accounting
- To clear the concepts ost Centre and Cost Unit
- To Explain the Classification of cost and Elements of cost
- To Unable the students to prepare the Cost Sheet

5.1 INTRODUCTION

In the modern age of business the management needs much more information than supplied by the Financial Accounting. Usually Financial Accounting provides only the information related to the profits or losses of the business activities for a particular period and the financial position of the business on the particular date. This information is insufficient to take various managerial decisions. Here the new branch of accounting emerged namely Cost Accounting. Thus Cost Accounting is relatively a recent development. In the earlier stages

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it started as a branch of Financial Accounting but now it has been developed as a special profession due to its scope and importance. Now It is used in profit and non profit organisations engaged in manufacturing and non manufacturing organisations.

In the primary stages Cost Accounting largely used for- recording the expenditures, determining factory cost, inventory valuation, pricing and profit determination. Now it has become so wide that it includes administration, selling and distribution expenses and covers the areas like cost control, cost analysis, budgeting etc., which are useful for taking various managerial decisions.

5.2 MEANING OF COST ACCOUNTING

The term Costing and Cost Accounting are often used interchangeably. But there is a technical difference between the two. Costing is simply Cost finding by using the various techniques and processes. On the other hand Cost Accounting includes the formal accounting mechanism by means of which various expenses are recorded and costs are ascertained. Cost Accounting relates to the collection, classification, ascertainment of cost , its accounting the control of cost.

5.3 DEFINITION OF COST ACCOUNTING

Definitions Of Cost Accounting:

" Cost Accounting is the process of accounting for cost from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest usage, it embraces the preparation of statistical data, the application of cost control methods and ascertainment of profitability of activities carried out or planned."

Chartered Institute of Management:

" Cost Accounting is a set of procedures for determining the cost of a product and various activities involved in its manufacture and sale and for planning and measuring performance."

Gillespie

The Costing Accounting is a formal mechanism by means of which the cost of a product or a service is ascertained and controlled.The above definitions of Cost Accounting explains that Cost Accounting is the technique applied for classifying, recording and appropriate allocation of expenditures for the determination of the cost of products or services, and for the presentation of suitably arranged data for purpose of control and guidance of management.

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5.4 SCOPE OF COST ACCOUNTING

The meaning of the term Scope is the areas covered.To know about the scope of Cost Accounting the opinion of Kohler is very important, he says, "Cost Accounting includes the design and operation of cost system and procedures, the determination of cost by departments functions, responsibilities, activities, products, territories, period and other units of forecast, future costs and standard costs, as well as historical costs ; the comparison of cost of different periods, of actual with estimated standard cost, the presentation and interpretation of cost data as an aid to management in controlling current and future operations." After analysing the definitions of Costing Accounting it can be said that Cost Accounting covers the following areas :

- **Cost ascertainment :**

Cost Accounting collects the cost data from various sources under appropriate heads of accounts and then analyse the costs under the various elements of cost. Then various statements are prepared where the elements of cost are recorded systematically. Making use of the relative information included in the respective statements Cost Accounting ascertains the cost for particular product, job or process.

- **Cost Control :**

Cost Accounting includes various techniques like Standard Costing, Budgetary Control which are useful for cost control. Here the costs are pre-determined and such estimated costs are compared with the actual costs. Then various statements are prepared to analyse the difference for e.g. Variances analyses, Idle time analyses etc. Such statements are useful for cost control.

- **Decision Making :**

Cost Accounting technique like Marginal Costing is useful for price fixation and taking various decisions such as accept or reject the increased demand, make or buy the product, increase the profits or not etc.

- **Cost Audit :**

The purpose of Cost Audit is to ensure that the costing books are arithmetically accurate as well as to see that the principles and rules have been applied correctly. Cost Accounting includes Cost Audit also.

5.5 DIFFERENCE BETWEEN FINANCIAL ACCOUNTING AND COST ACCOUNTING

FINANCIAL ACCOUNTING	COST ACCOUNTING
1. OBJECT	
To provide the information about the profit or loss and the financial position of the business to the	To provide detailed cost information to the management for proper planning, control and

owners and other outside parties.	decision making purpose.
2. STATEMENTS PREPARED	
To fulfil the above objective statements as Profit and Loss Account and Balance Sheet are prepared here.	To fulfil the object the statement as Cost Sheet, Loss of Material Report, Idle Time Report, Variance Report etc., are prepared here.
3. PREPARATION PERIOD	
The above statements are usually prepared at the end of the year.	Here the various statements and reports are prepared as and when desired by management.
4. STATUTORY REQUIREMENT	
These accounts are kept obligatory to meet the requirement of Companies Act and Income Tax Act.	These accounts are kept voluntarily to meet the requirements of management. But now Companies Act has made it obligatory to keep cost records in some manufacturing industries.
5. CONTROL ASPECT	
It gives importance to recording the financial transactions. Control aspect is ignored here	The control aspect is very important here. For controlling purpose it provides techniques like Budgetary control, Standard costing etc.
6. NATURE OF TRANSACTION	
The transactions included here are based on actual facts and figures. Only the commercial transactions are included here.	The transactions included here are based partly on facts and partly on estimates. Commercial as well as internal transactions i.e. internal transfers etc., are also recorded here.
7. ANALYSIS OF COST AND PROFIT	
It shows the profits or losses of the whole business for a particular period.	It shows the detailed cost data as well as profits for each product, department, process etc., individually as and desired.

5.6 CONCEPT OF COST CENTRE AND COST UNIT

The total cost should be determined by applying different methods of costing. But for allocation and ascertainment purpose it becomes necessary to break up or separate the cost. For this purpose to study about the concepts Cost Centre and Cost Unit is very important.

5.6.1 COST CENTRE:

Cost centres are set up to allocate the cost on each centre, thereby cost control should be possible. Chartered Institute of Management and Accountants London defines Cost Centres as," A location, person or item of equipment (or group of these), for which cost may be ascertained an used for the purpose of control."

❖ **Main Features of Cost Centres:**

1. It is the section or sub section of business to which the costs can be allocated.

2. It may be a location, i.e. a department, a sales area etc., on which the costs can be charged.

3. It may be an item of equipment i.e. a machine, a vehicle etc., to which the cost can be allocated.

4. It may be a person or group of persons i.e. a sales man, a machine operator etc. On which the cost may be allocated.

❖ **Cost centres are divided as:**

1. **Personal Cost Centre** – If includes a person or a group of person for e.g. a sales man, Machine Operator, group of Machine operator operating one Machine

2. **Impersonal Cost Centres –** It includes a location, an equipment or group of these.

3. **Production Cost Centres** - It includes the Cost Centre where the production work take place for e.g. Melting department, Welding, Finishing department etc. Cost incurred by these centres can be charged directly to a particular product.

4. **Service Cost Centre** – It includes ancillary departments which are rendering services to production and other departments in the business. The cost incurred by these centres are of indirect nature for e.g. Canteen, Tool room, Power house etc.

   The Cost Centres are set up to ascertain the cost of that centre and to control the cost. Suppose if Sales man is a cost centre all the costs related to this centre i.e. his salary, commission, training expenses, allowances etc., are charged to it. Thus, the total cost of that centre is ascertained. Cost control is the main objective to ascertain the cost of the centre. The person in charge of that centre is held responsible for the control of cost.

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The number and size of cost centres depend upon the expenditures involved and the requirements of management for the purpose of cost control.

5.6.2 COST UNIT:

Cost Unit is a device where the costs are further divided into smaller sub divisions than in the cost centres. Cost centre is the step where the total cost is allocated to allocation or an equipment or a person or group of these. On the other hand, cost unit is the step where the above allocated cost is subdivided into smaller subdivisions thereby the cost of saleable products or services can be ascertained.

Chartered Institute of Management London defines Cost Unit as, " It is a unit of product, service or time in relation to which the cost may be ascertained or expressed." For e.g. cost per tonne in case of Mines, cost per metre in case of Textile Industries etc. Here a tonne, a metre are the units to measure the coal, cloth to determine the cost for selling purpose.

❖ **Main features of Cost Unit**

1. It is the measurement of cost to be stated in the terms of number i.e. weight, length, area, volume etc.

2. It must be clearly defined and selected before the process of cost determination.

3. It must not be too big or too small. It means the cost unit must be applicable to the circumstances under consideration for e.g. cost for 1000 bricks not 1 brick, here 1000 bricks is the appropriate cost unit which is applicable in wholesale and retail transactions.

❖ **Cost Units are divided as:**

- **Units of production** :- Which are generally decided for production industries for e.g. in case of Mines Tonne of coal, in case of Printing Press Thousand copies, in case of Bricks Thousand Bricks.

- **Units of Services :-** Which are generally decided for service rendering industries, for e.g. Transport Service - Per Passenger Per Mile , Hotel Service – Room Per Day, Electricity Service - Kilowatt Hour etc.

5.7 CLASSIFICATION OF COST

For proper control and taking managerial decisions classification process is very essential. It is the systematic process where the costs are grouped according to their common characteristics

Cost are generally classified as below to achieve different objectives:

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5.7.1 On the basic of Identifiability :

1. **Direct Cost :-** These are the costs which can be directly charged to a particular cost centre or cost unit. It includes Direct material, Direct labour and Direct expenses.

2. **Indirect cost :-** These are the costs which are incurred for the benefit of a number of cost centres and cost units therefore cannot be charged to a particular cost centre or cost unit. These are of a general nature and incurred for the organisation as a whole. All the factory overheads, office and administration overheads, selling and distribution overheads are included in indirect cost.

5.7.2 On the basic of Behaviour :-

1. **Fixed Cost :-** These costs remain constant in **'total'** amount and not related to the volume of production. For e.g. rent, insurance of building, managerial salaries, bank charges, office expenses etc. These costs do not increase or decrease in 'total' when the volume of production changes but fixed cost **'per unit'** increases when volume of production decreases, and vice versa.

2. **Variable Cost :-** These costs vary in **'total'** amount in direct proportion to the volume of production but the variable cost per unit remains fixed. For e.g. direct material, direct labour, power etc.

3. **Semi variable cost :-** These costs include both a fixed and a variable component. These are partly variable and partly fixed. For e.g. telephone expenses include a fixed portion of annul charges plus variable charge according to calls.

5.7.3 On the basic of time

1. **Historical Cost :-**These costs are ascertained after they have been incurred. These are the actual costs. These costs are available only after the completion of the manufacturing activity.

2. **Pre-determined Cost :-** These costs are estimated costs which are ascertained in advance for the planning and control purpose.

5.7.4 On the basic of Controllability :-

1. **Controllable Cost :-** The costs within the control of management are controllable costs. Variable costs are generally controllable costs which are controlled by department heads. For e.g. raw material cost.

2. **Non-controllable Costs :-** These are the costs on which management can have no control. These costs cannot be influenced by the action of a specified member of an organisation. For e.g. factory rent , managerial salary, costs of service centres etc.

5.7.5 On the basic of Normality :-

1. **Normal cost :-** It is the cost which is normally incurred on expected lines at a given level of output. This cost is the part of Cost of Production.

2. **Abnormal cost :-** It is the cost which is not normally incurred at a given level of output. This cost is not incurred normally but incurred only in certain cases. Such cost is over and above the normal cost and is not treated as a part of the Cost of Production and charged to Costing Profit and Loss Account.

5.8 DETERMINATION OF TOTAL COST

A Cost is the composition of three elements i.e. material, labour and expenses. While determining the total cost it becomes necessary to study about these three elements thoroughly for proper control and managerial decisions. It is very important to analyse the total cost by elements of cost i. e. Material, Labour and Expenses.

There are Three elements of cost :

1] Material

2] Labour

3] Expenses

These elements further divided as :-

1] Direct material and Indirect material

2] Direct labour and Indirect labour

3] Direct Expenses and Indirect expenses [Overheads]

The degree of ease and feasibility with which the elements of cost can be charged to the finished product will determine what is to be treated as Direct and what is to be Indirect

5.9 ELEMENTS OF COST

DIRECT COST: INDIRECT COST/ OVER HEADS/ ON- COST

- Direct material / Indirect material
- Direct labour / Indirect labour
- Direct expenses / Indirect expenses

(i) Direct material : These are the material which can be conveniently measured and direct charged to a particular product. For e.g. timber in Furniture making, bricks, cement, steel used in Building, leather used in Leather goods.

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(ii) Direct Labour : It includes the wages paid to those employees who directly operate the manufacturing machinery and equipments. These wages can conveniently identified with a particular product, job or process.

(iii) Direct Expenses : These are the expenses which can be identified with and allocated to cost centres or cost units. It includes all the expenses other than direct material and direct labour that are specially incurred for a particular product, job or process. For e.g., Cost of patent right, Royalty on production, Experimental expenses, Depreciation or Hire of special plant or equipment for a particular job, Architect or Surveyor's fees etc.

(iv) Indirect Material: These are the materials which cannot be conveniently identified with a particular product, job or process. It includes the materials which form part of the product but minor in importance and relatively inexpensive. For e.g. nails used in furniture, thread used in stitching garments, etc. Those items of materials which do not become a part of the finished products are also included here for e.g. coal, lubricating oil and grease, sand paper used in polishing etc.

(v) Indirect Labour: These are the labours which are not directly engaged in the production operations but only assist in the production operations. For e.g. Time keeper's wages, wages of factory clerk etc

(vi) Indirect Expenses: These are the expenses which cannot be directly identified with a particular product, job or process. These are so general in nature.

This group of expenses is sub divided as :

a. **Factory overheads / Production overheads /Works overheads/ Manufacturing overheads:** It includes all the expenses related to factory. It includes indirect material, indirect labour and indirect expenses in producing goods and services. For e.g. factory rent, taxes, insurance, depreciation and repairs of factory building, plant & machinery, factory lighting, power etc.

b. **Office and Administration overheads :** It includes all the expenses related to general administrative function i.e., planning, organising, decision making, controlling, directing and motivating the personnel such as office staff salaries, depreciation and repairs of office building, furniture, office rent, rates, taxes, insurance, printing and stationery etc.

c. **Selling and Distribution overheads :** The cost of promoting sales and retaining customers is termed as Selling expenses, for e.g. advertisement. Samples and free gifts, salaries and commission to salesmen etc.

Distribution overheads are those which incurred from the time the production is completed until it reaches to the final consumer for e.g. carriage and freight outward, delivery van expenses, ware housing, insurance of goods in transit etc.

Following are the steps to Determine the total cost

1. PRIME COST
   = Direct Material + Direct Labour + Direct Expenses

2. WORKS COST / FACTORY COST
   = Prime cost + Factory Overheads

3 COST OF PRODUCTION
   = Works cost + Office / Administration Overheads

4 COST OF SALES / TOTAL COST
   = Cost of Production + Selling and Distribution Over heads.

5 SELLING PRICE = Total cost + Profit

- **Non- Cost Items:**

There are some items which are excluded from cost accounts. The expenses which are related to capital assets, capital losses, payments by way of distribution of profits and purely financial items are excluded from cost. The examples are – Income Tax, dividends, debenture interest loan interest donations and Expenses not related to business, abnormal wastage of material, abnormal idle time and all capital Expenditures, cash discount, appropriation of profits(transfer to various reserves for e.g. general reserve, reserve for doubt full debts etc.), profit or loss on sale of assets, miscellaneous expense written off in the form of Discount on redemption of debentures, preliminary expenses, goodwill etc., written off, under writing commission. Such items are excluded while preparing the Cost Sheet.

5.10 COST SHEET / STATEMENT OF COST:

Cost Sheet is detailed analysis of the different elements of cost of a particular output for a particular accounting period. It shows the detailed cost of a product. It should be prepared at weekly, monthly, or other convenient intervals. There is no fixed form for preparing the cost sheet but generally it is prepared in columnar form where the columns would depend upon the requirement of management Generally there are three columns viz. Particulars, Total cost and Unit cost.

A specimen of Cost Sheet is given below :-

PARTICULARS	Total cost Rs.	Cost Per Unit Rs.

Direct Materials : Opening stock +Purchases... +Carriage inwards... Less: Closing stock... . **Direct materials consumed** +Direct wages +Direct expenses **PRIME COST** Add : Works or Factory Overheads (All expenses relating to Factory such as: Indirect materials Indirect wages Factory Rent, Rates, Taxes, Insurance Lighting and heating Power and Fuel, Hauling charges Depreciation, Repairs, Insurance etc., of Factory Machinery, Building etc. Time Keeper's, Store Keeper's Wages Drawing office expenses Loose Tools written off Factory stores Works Manager's salary etc . **Total Factory Overheads** Add : Opening Balance of Work-in-Progress Less: Closing Balance of Work- in-Progress Less : Sale of Scrap **WORKS OR FACTORY COST** Add : Office and Administrative Overheads All expenses relating to Office such as Office Rent, Rates, Taxes, Insurance Depreciation, Repairs etc., of office building, furniture, equipments etc. Printing and stationary Postage and telegrams Counting house salary Legal expenses		

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Bank charges etc.		
COST OF PRODUCTION		
Add : Opening stock of finished goods		
Less : Closing stock of finished goods		
COST OF GOODS SOLD		
Add : Selling and Distribution Overheads		
Showroom rent and rates		
Salesman's salary, commission, travelling expenses		
Advertising		
Bad debts		
Depreciation and expenses of delivery van		
Carriage and freight outward		
Sample and other free gifts etc.		
TOTAL COST OF SALES		
Add : Net Profit		
SALES		

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Illustration 5.1

Prepare a Cost Sheet from the details given below:

Inventories (opening)	
Finished Stock	40,000
Raw Materials	70,000
Work-in-Process	1, 00,000
Office Appliances	8,000
Plant & Machinery	2, 30,000
Building	1, 00,000
Raw Materials Purchased	1, 60,000
Freight Inward	8,000
Purchases Returns	2,400
Sales	3, 84,000
Sales Returns	7,000
Direct Wages	80,000
Indirect Wages	9,000
Factory Supervision	5,000
Repairs and upkeep-Factory	7,000
Heat, Light, and Power	32,500
Rate & Taxes	3,000

Sundry Factory Expenses	9,500
Sales Commission	10,800
Sales Travelling	5,500
Sales promotion	11,250
Distribution Dept. - Salaries & Expenses	9,000
Office Salaries & Expenses	4,300
Income Tax paid	2,700
Dividend Paid	2,500
Closing Inventories	
Finished Goods	57,500
Raw Materials	90,000
Work-in-Progress	96,000
Accrued Expenses	
Indirect Labour	600

Depreciation to be provided as under :

Office Appliances @ 5% ; Plant & Machinery @ 10% and Building @4%.

Distribute the following costs:

- Heat, Light and Power to Factory, Office and Distribution in the ratio 6 : 2 : 2
- Rates and Taxes to Factory and Office in the ratio 2 : 1.
- Depreciation on building to Factory, Office and Selling in the ratio 6 : 2: 2.

Solution:

COST SHEET

Particulars		**Rs.**	**Rs.**
Opening Stock of Raw Materials			70,000
Add: Purchases of RM		1,60,000	
Less : Purchases Returns		2,400	1,57,600
Add : Freight Inward			8,000
			2,35,600
Less : Closing Stock of Raw Materials			90,000
MATERIALS CONSUMED			1,45,600
Add: Direct wages			80,000
PRIME COST			2,25,600
Add : Works Overheads / Factory Overheads			

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IndirectWages	9,000		
Add: Accrued Indirect Labour	600	9,600	
Factory Supervision		5,000	
Repairs and Upkeep- Factory		7,000	
Depreciation of Plant & Machinery		23,000	
Depreciation of Building (4,000 × 3/5)		2,400	
Heat, Light, Water (32,500 × 3/5)		19,500	
Rates & Taxes (3,000 × 2/3)		2,000	
Sundry factory expenses		9,500	78,000
Add : Opening Work- in- Progress			1,00,000
			4,03,600
Less : Closing Work-in-Progress			96,000
WORKS COST / FACTORY COST			3,07,600
Add : Administrative & Office Overheads			
Office Salaries and Expenses		4,300	
Heat, Light and Power (32,500 × 1/5)		6,500	
Rates & Taxes (3,000 × 1/3)		1,000	
Depreciation of Building (4,000 × 1/5)		800	
Depreciation of Office Appliances		400	13,000
COSST OF PRODUCTION			3,20,600
Add : Opening Stock of Finished Goods			40,000
			3,60,600
Less : Closing Stock of Finished Goods			57,500
COST OF GOODS SOLD			3,03,100
Add : Selling and Distribution Overheads			
Sales Commission		10,800	
Saes Travelling			

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		5,500	
Sales Promotion		11,250	
Depreciation of Building (4,000 × 1/5)		800	
Distribution Dept.- Salaries & Expenses		9,000	
Heat, Light & Power (32,500 × 1/5)		6,500	43,850
TOTAL COST			3,46,950
Add : Profit			30,050
SALES			**3,77,000**
(PROFIT = SALES -- TOTAL COST)			

NOTE :- Income Tax Paid, Dividend Paid are the Non Cost items therefore excluded from Cost sheet. Office Appliances, Plant & Machinery, Building are the Assets hence only the depreciation is taken into account.

Illustration 5.2

The following is the Profit and Loss Account for the year ending 31st March, 2007 for a manufacturer of Table Fans. They manufactured and sold 2,000 fans during the year.

Particulars	Rs.	Particulars	Rs.
To Materials Consumed	1,20,000	By Sales	6,00,000
To Wages	1,80,000		
To Manufacturing Expenses	75,000		
To Gross Profit c/d	2,25,000		
	6,00,000		**6,00,000**
To Rent, Rates, Taxes	15,000	By Gross Profit	2,25,000
To General Expenses	30,000		
To Management Expenses	90,000		
To Sales & Distribution	45,000		
To Net Profit	45,000		
	2,25,000		**2,25,000**

Their estimate for the next year ending 31st March, 2008 are as under:

1. The production and sales would increase to 3,000 fans
2. The price of materials per fan would increase by 20%.
3. The labour cost per fan would go up by 10%.

4. The manufacturing expenses would remain in the same proportion to combined cost of material consumed and wages as in the previous year.

5. Selling and distribution expenses per fan would remain unchanged.

6. Other expenses would remain unaffected on account of increase in production.

Prepare a statement of cost and profit per fan and total cost, total profit for the years 2006 - 07 and 2007-08.

Solution

STATE MENT OF COST AND PROFIT

For the year ending 31st March 2007

Manufacture and sale of 2,000 fans

Particulars	**Total cost Rs.**	**Cost per fan Rs.**
Material Consumed	1,20,000	60.00
+ Direct Wages	1,80,000	90.00
PRIME COST	3,00,000	150.00
+ Manufacturing Expenses	75,000	37.50
WORKS COST	3,75,000	187.50
+ Office and Administration expenses		
Rent, rates, taxes 15,000		
General Expenses 30,000		
ManagementExpenses 90,000	1,35,000	67.50
COST OF PRODUCTION	5,10,000	255.00
+ Sales and Distribution Expenses	45,000	22.50
TOTAL COST	5,55,000	277.50
+ Profit	45,000	22.50
SALES	6,00,000	300.00

STATE MENT OF COST AND PROFIT

For the year ending 31st March 2008

Manufacture and sale of 3,000 fans

Particulars	**Total cost Rs.**	**Cost Per Unit Rs.**
Material consumed	2,16,000	72.00
+ Direct Wages	2,97,000	99.00
PRIME COST	5,13,000	171.00
+ Manufacturing expenses		
(25% of Prime Cost	1,28,250	42.75

i.e. 25% of Rs. 5,13,000)			
WORKS COST		6,41,250	213.75
+Office and Administration expenses			
Rent, rates, taxes	15,000		
General Expenses	30,000		
Management Expenses	90,000	1,35,000	45.00
COST OF PRODUCTION		7,76,250	258.75
+Sale and Distribution Expenses (Rs.22.50 per fan × 3,000 fans)		67,500	22.50
TOTAL COST		8,43,750	281.25
+PROFIT		56,250	18.75
SALES (Selling price Rs. 300 per fan × 3,000 fans)		9,00,000	300.00
Note : It is assumed that the selling price per unit has remained the same			

WORKING NOTES :

- Calculation of Material Consumed :

	Rs.
Material Cost per fan	60
+ 20% increase in per unit cost	12
Material consumed per unit	**72**

- Calculation of Labour Cost

Labour cost per unit	90
+10 % increase in per unit cost	9
Labour cost per unit	**99**

- Calculation of Manufacturing Expenses in the proportion of PRIME COST

$$\frac{75{,}000 \times 100}{3{,}00{,}000} = 25\%$$

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6

MARGINAL COSTING

Unit Structure :

6.1 Marginal Costing Meaning & Definition

6.2 Fetures of Marginal Costing

6.3 Advantages of Marginal Costing

6.4 Limitations of Marginal Costing

6.5 Marginal Costing

6.6 Short Term (Tactical) Decisions

6.7 Marginal Cost and Product Pricing

6.8 Cost Volume Profit Analysis

6.9 Break-Even Sales

6.10 Margin of Safety

6.1 MARGINAL COSTING MEANING & DEFINITION

Marginal cost is defined as "The variable cost of one unit of a product or service, i.e. a cost which can be avoided if the unit was not produced or provide (CIMA, Official Terminology)

As already discussed, under marginal costing system products are barged with only those costs which vary directly with the change in the volume of production. In other words, under this system only prime cost (the total of direct material cost, direct labour cost and direct expenses) and variable factory over head are treated as product cost while fixed factory overhead along with selling and distribution overhead and administration overhead is treated as period cost.

Variable costing and Direct costing are synonyms of marginal costing.

6.2 FETURES OF MARGINAL COSTING

(i) This technique is used to ascertain the marginal cost and to know the impact of variable costs on the volume of output.

(ii) All costs are classified on the basis of variability into fixed cost and variable cost. Semi-variable costs are segregated into fixed and variable costs.

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(iii) Marginal (i.e., variable) costs are treated as the cost of the product or service. Fixed costs are charged to Costing Profit and Loss Account of the period in which they are incurred.

(iv) Stock of finished goods and work-in-progress are valued on the basis of marginal costs.

(v) Selling price is based on marginal cost-plus contribution.

(vi) Profit is calculated in the usual manner. When marginal cost is deducted from sales it gives rise to contribution. When fixed cost is deducted from contribution it results in profit.

(vii) Break-even analysis and cost-volume profit analysis are integral parts of this tech-nique.

(viii) The relative profitability of products or departments is based on the contribution made available by each department or product.

6.3 ADVANTAGES OF MARGINAL COSTING

(i) The technique is simple to understand and easy to operate because it avoids the complexities of apportionment of fixed costs which, is really, arbitrary.

(ii) It also avoids the carry forward of a portion of the current period's fixed overhead to the subsequent period. As such cost and profit are not vitiated. Cost comparisons become more meaningful.

(iii) The technique provides useful data for managerial decision-making.

(iv) There is no problem of over or under-absorption of overheads.

(v) The impact of profit on sales fluctuations are clearly shown under marginal costing.

(vi) The technique can be used along with other techniques such as budgetary control and standard costing.

(vii) It establishes a clear relationship between cost, sales and volume of output and break-even analysis.

(viii) It shows the relative contributions to profit which are made by each of a number of products, and shows where the sales effort should be concentrated.

(ix) Stock of finished goods and work-in-progress are valued at marginal cost, which is uniform.

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6.4 LIMITATIONS OF MARGINAL COSTING

Marginal costing suffers from the following limitations:

(i) Segregation of costs into fixed and variable elements involves considerable technical difficulty.

(ii) The linear relationship between output and variable costs may not be true at different levels of activity. In reality, neither the fixed costs remain constant nor do the variable costs vary in proportion to the level of activity.

(iii) The value of stock cannot be accepted by taxation authorities since it deflates profit.

(iv) This technique cannot be applied in the case of contract costing where the value of work-in-progress will always be high.

(v) This technique also cannot be used in the case of cost plus contracts unless fixed costs and profits are considered.

(vi) Pricing decisions cannot be based on contribution alone.

(vii) The elimination of fixed costs renders cost comparison of jobs difficult.

(viii) The distinction between fixed and variable costs holds good only in the short run. In the long run, however, all costs are variable.

(ix) With the increased use of automatic machinery, the proportion of fixed costs increases. A system which ignores fixed costs is, therefore, less effective.

(x) The technique need not be considered to be unique from the point of cost control.

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6.5 MARGINAL COSTING

Sales **Less: Variable Cost** - Variable manufacturing costs : • Direct material • Direct expenses - Variable factory overhead - Variable Selling and distribution overhead - Variable administration overhead **Contribution** **Less: Fixed cost** • Fixed Manufacturing overhead • Fixed Selling & Distribution overhead • Fixed Administration overhead **NET INCOME**	

6.5.1 NET INCOME

The contribution margin figure, which is determined at the first step in matching cost with revenue in the marginal costing income statement is very useful for forecasting and reporting income for internal management purposes. The underlying principle in income forecasting and decisions making using contribution margin is that the fixed costs remain unchanged over a relevant period and within the relevant range of activity and therefore, variable costs which vary in direct proportion to the changes in the activity level are the only RELEVANT COSTS when decisions variables lie within the relevant range and decisions over the relevant period.

One of the greatest advantages of marginal costing income statement is that it focuses on the impact that period costs (synonym of fixed costs) have on profits. This makes marginal costing income statement very useful for internal reporting.

6.5.2 Contribution as an Indicator of Profitability

The following diagram reflects how individual products contribute towards over all profit of the firm.

PRODUCT X	PROUCT Y	PRODUCT Z
Total Sales Value	Total Sales Value	Total Sales Value
Minus	Minus	Minus
Marginal cost of	Marginal cost of	Marginal cost of
Goods sold	goods sold	goods sold
Yields	Yields	Yields
Contribution margin	Contribution Margin	Contribution Margin
	Contribution Fund	
	Minus	
	Fixed Cost	
	Leaves	
	Profit	

The above diagram reflects that contribution from each product towards fixed cost and profit determines the profit of the firm as a whole. Fixed cost being a constant factor, overall profit depends 0on the size of the contribution fund. Management endeavours to maximize the contribution fund by selecting between various alternatives. Short term decisions (often termed as tactical decisions) make extensive use of the marginal costing concept.

Contribution per unit is taken as the profitability index for each product. Profit per unit (i.e. selling price per unit minus average cost of sales per unit) may lead to wrong decisions. To illustrate the point, let us consider the following example.

Illustration 6.1

Management is considering utilization of spare capacity by introducing a new product A which has the following cost structure

Variable manufacturing cost per unit Rs.80

Allocated average fixed factory overhead per unitrs.20

There is no additional expenditure on selling and distribution.

The product is expected to be sold at Rs.95 per unit.

Solution:

Prima facie it may appear that the new product is unprofitable because the selling price of Rs.95 per unit is lover than the cost of sales of Rs.100 However, if we compare marginal cost per unit of Rs.80 with the selling price of Rs.95 we find that the product will contribute towards fixed cost and profit at the rate of Rs.15 per unit and therefore it is advisable to introduce the product. Allocated fixed cost is irrelevant for the decisions became total fixed cost will not be affected by the decision.

6.5.3 Contribution Per Unit of Limiting Factor:

Limiting factor has been defined as "The factor in the activities of an undertaking which at a particular point of time or over a particular period will limit the volume of out put. Limiting factor restricts the number of Units they can be produced or sold. Typical examples of limiting factor are:

(i) Demand in quantity;

(ii) Demand in value

(iii) Availability of material

(iv) Availability of Labour

(v) Plant capacity in terms of available machine hours.

More than one limiting factor may opera at a particular point of time. Under such a situation the factor which keeps the activity level at the minimum should be considered as the key factor. However, the impact of other factors should also be considered in arriving at the final decision.

Maximum contribution fund can be achieved by manufacturing and selling that product which best utilizes the limiting factor. Profitability index, in such a situation, is contribution per unit of the limiting factor. The following example further clarifies the point.

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Illustration 6.2

A firm can produce two products 'X' and 'Y'. the following are the cost structures :

	Per Unit (Rs)	
	X	Y
Selling price	20	22
Variable manufacturing cost	5	6
Variable selling expenses	3	2
Labour hours	2	3

Total available labour hours is 1,200 per week. There is no other limiting factor in operation. Which of the products should be manufactured and sold?

Solution:

Contribution Statement:

		X	Y
		Rs.	Rs.
(i)	Selling price	20	22
(ii)	Variable manufacturing cost	5	6
	Variable selling expenses	3	2
	Total Variable cost	8	8
(iii)	Contribution per unit (i – ii)	12	14
(iv)	Contribution per labour hour	2	3
		- Rs.6	**- Rs.4.67**

If we take contribution per unit as profitability index, product Y is considered to be more profitable as compared to X because contribution per unit of Y is higher as compared to the Contribution per unit of X However, in the given situation this profitability index misleads the decision maker. Let us verify:

Total available labour hours are 1,200

Maximum number of units, that can be produced and sold

X $\frac{\text{1,200 hours}}{\text{2 hrs}}$ i.e. 600 units

Y $\frac{\text{1,200 hrs.}}{\text{3 hrs.}}$ i.e. 400 units

Maximum contribution:

X = 600 units x Rs.12 per unit i.e. Rs.7,200

Y = 400 units x Rs.14 per unit i.e. Rs.5,600

From the above it is clear that total contribution from product a is more as compared to the contribution from product Y, hence, product a should be selected to maximize the total contribution. This is contrary to that indicated by the Profitability Index if contribution per unit is used to measure profitability.

The decision maker would be guided correctly if Contribution per unit of limiting factor is used as Profitability Index. Contribution per labour hour is more for X as compared to that for Y and therefore, X is more profitable. This leads to the selection of a which makes the best utilization of the available labour hours the limiting factor.

The Maximum contribution from each product may be worked out as follows:

Maximum contribution – Available hours contribution per hour

Maximum contribution from A = 1.200 x Rs.6 = Rs.7,200

Maximum contribution from B = 1.200 x Rs.4.67 = Rs.5,600

Determination of the limit9ing factor poses problems because it changes rapidly. A detailed study of the economic environment and the supply market of various resources as well as a study of the internal factors is necessary to identify the potential limiting factors. This is important for performance planning. The determination of limiting factor is comparatively simple when only one product is produced or when more than one product is produced using the same raw material labour and other resources and through the same process. However, it becomes very complex when a number of products are manufactured from a variety of materials with different types of labour using different types of machines or applying different processes.

6.6 SHORT TERM (TACTICAL) DECISIONS

Marginal costing technique is frequently used by managers for short term decision making in the following paragraphs we shall discuss the applications of the technique in decision making. However, we must keep in mind that the basic assumption of linear relationship between cost and revenue does not hold good beyond the relevant range and this limits the precision and reliability of decisions based on marginal costing. Similarly in practice, it is difficult to segregate the total cost into fixed and variable elements accurately Inspite of these limitations, marginal costing t4chnique has emerged as an important management tool.

6.6.1 Determination of the Most Profitable Products Mix

In determining the most profitable product mix, the short term profitability of products is assessed by measuring contribution per unit when no limiting factor is in operation and by measuring contribution per unit of the limiting factor when a limiting factor is in operation. The most profitable product is the one which has the highest contribution as unit or the highest contribution per unit of the limiting factor as the case may be. The products are to be ranked accordingly for profitability.

Illustration 6.3

(a) The following particulars are extracted from the records of a company

	Product X	Product Y
Sales (per unit)	100	120
Consumption of material	2kg	3kg
Material cost	Rs.10	Rs.15
Direct wages cost	Rs.15	Rs.10
Direct Expenses	Rs.5	Rs.6
Machine hours used	3	2
Overhead expenses:		
Fixed	Rs.5	Rs.10
Variable	Rs.15	Rs.20

Direct wage per hours is Rs.5. Comment on the profitability of each product (both use the same raw material) when

(i) Total sales potential is units is limited

(ii) Total sales potential in value is limited;

(iii) Raw material is in short supply

(iv) Production capacity (in terms of machine hours) is the limiting favor

(b) Assuming Raw – material is the key factor – availability of which is 10,000 kg. and maximum sales potential of each product being 3,500 units, find the product mix which will yield the maximum profit.

Solution –

		Per Unit	
		Product X	Product Y
		Rs.	Rs.
(i)	Sales	100	100
(ii)	Variable cost:		
	Direct material	10	15
	Direct wages	15	10
	Direct expenses	5	6

	Variable overhead	15	20
	Total variable cost	45	51
(iii)	Contribution per unit (i – ii)	55	69

(a) Ranking of Products in terms of Profitability –

(i) Total sales potential in units is limited

Basis : Contribution per unit : Product X Rs.55
Product Y Rs.69

Ranking 1st Product X
2nd Product Y

(ii) Total sales potential is value is limited:

Basis Contribution per rupee of sales value i.e.

$$\frac{\text{Contribution per unit}}{\text{Selling price per unit}}$$

Product X $\frac{\text{Rs.55}}{\text{Rs.100}}$ = Rs.0.55

Product Y $\frac{\text{Rs.69}}{120}$ = Rs.0.575

Ranking: 1st Product Y
2nd Product X

(iii) Raw material is in short supply

Basis : Contribution per unit of raw material consumption

i.e. $\frac{\text{Contribution per unit}}{\text{Material consumption (in quantity) per unit}}$

Product X $\frac{\text{Rs.55}}{\text{2 kg}}$ = Rs.27.50 per kg.

Product Y $\frac{\text{Rs.69}}{\text{3 kg}}$ = Rs.23.00 per kg.

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Ranking 1st Product X
2nd Product Y

(iv) Production capacity (in terms of machine hours) is the limiting factor)
Basis: Contribution per unit of machine hour.

$$\text{i.e} \quad \frac{\text{Contribution per unit}}{\text{Machine hours used per unit}}$$

Product X $\frac{\text{Rs.55}}{\text{3 hrs.}}$ = Rs.18.33 per hour

Product Y $\frac{\text{Rs.69}}{\text{2 hrs.}}$ = Rs.34.50 per hour

Ranking: 1st Product B
2nd Product A

(b) When raw material is the key factor, our ranking is Product X – 1st and Product Y – 2nd Management would, therefore, intend to produce Product X which best utilize the available raw material.

However, there is another limiting factor in operation, that is, maximum sales potential. This factor will set the limit for production of product X. The following will be the allotment of available raw material between Product X and Product Y.

Available raw material	10,000 kg.
Maximum Sales potential for Product X (ranked 1st) 3,500 units	
Raw material required for X 3,500 x 2 kg.	(7,000 kg)
Balance available for Product Y	3,000 kg

Maximum number of Product Y that Can be produced with available

Raw-material $\frac{3{,}000}{3}$ kg. i.e. 1,000 units

Product mix which will yield the maximum profit:
Product X 3,500 units
Product Y 1,000 units

Total contribution:

Product X 3,500 x Rs.55	=	1,92,500
Product Y 1,000 x Rs.69		69,000
Total		Rs. 2,61,500

Total Fixed cost:

Product X 3,500 x Rs.5	=	Rs.17,500
Product Y 1,000 x Rs.10	=	Rs.10,000
Total		Rs.27,500

Total Profit= Total Contribution - Total fixed cost
= Rs.2,61,500 – Rs.27,500
= Rs.2,34,000

6.6.2 Make or Buy Decision

If no limiting factor is in operation the decision to buy or to manufacture a product rests on whether the bought-out price is hither or lower than marginal cost. The fixed cost is irrelevant for our decision because fixed cost will not change as a result of buying the product/component from outside.

If the bought-out price of an article is lower than its marginal cost, it will be profitable to buy the article from outside in all circumstances.

If a limiting factor is in operation, the excess of bought out price over marginal cost per unit of the limiting factor is to be considered. The article having the lowest excess of bought out price over its marginal cost per unit of the limiting factor will be least costly.

Illustration 6.4

The Cost of manufacturing and bought out prices of the four articles are as follows:

Articles	A	B	C	D
Production cost per article:				
Marginal cost	Rs.10	Rs.12.	Rs.15	Rs.15
Fixed out	Rs. 2	Rs. 4	Rs. 5	Rs.15
Total	Rs.12	Rs.16	Rs.20	Rs.30
Production per man hour	0.25	0.20	0.20	0.33
Production per machine Hour	1.00	0.50	0.25	0.20
Bought out Price	Rs.9	Rs.17	Rs.22	Rs.26

Rank the products in order of your preference for buying them from outside (i) when there is no limiting factor; (ii) if man power is the limiting factor; (iii) if machine capacity is the limiting factor.

Solution

	A	B	C	D
Bought out price per unit	Rs.9	Rs.17	Rs.22	Rs.26
Marginal cost (per unit) of production	Rs.10	Rs.12	Rs.15	Rs.15
Excess of brought out Price over marginal cost				
Per article	100	5.00	7.00	11.00
Per manhour	-100x25	-5x20	-7x20	-11x33
	- 0.25	- 100	- 140	- 363
per machine hour	- 1x1	-5x50	-7x25	-11x20
	- 1.00	- 2.50	- 1.75	-2.20

In case of article A, the bought – out price is lower than the marginal cost, hence to purchase A from outsiders always profitable.

Ranking ofproducts in order ofpreference for buying out :

(1) When there is no limiting factor
1st A
2nd B
3rd C
4th D

(2) When manpower is the limiting factor
1st A
2nd B
3rd C
4th D

(3) When machine capacity is the limiting factor
1st A
2nd C
3rd D
4th B

Following Points may be taken in to account while making your Rankings -

(1) The application of marginal costing technique reveals that it is least desirable to buy not the article whose excess of bought out price over its marginal cost is the highest because the extra cost of buying results in loss of contribution.

Even when production facilities are available, it is desirable to purchase those articles from outside whose bought out prices lower as compared to

their marginal cost of production because this would result in additional contribution.

(2) Contribution per unit cannot be the basis for make or buy decisions, as contribution involves the use of selling price. Sale is not relevant because decision to make or buy in no way affects the sale volume or the selling price. "the only relevant information is extra cost of buying as opposed to contribution.

(3) The following non cost factors are impor5ant in 'make' or buy decisions;

(a) Loss of control over the source of supply; Reliability of the source of supply is important because costs which arise due to material shortage are very high for most of the organizations.

(b) Laying off of employees may impair the employer employee relations.

6.6.3 Decision on Methods of Manufacturing

Marginal Costing technique can be used in deciding which of the alternative methods of manufacturing should be adopted., the method which generates the highest contribution is the ,most desirable method. The decision, therefore, rests on the contribution per unit or the contribution per unit of the limiting factor when l9miting factor is in operation.

Illustration 6.5

AN undertaking is producing a PRODUCT, the selling price of which is Rs.20 per unit. A decision has to be taken whether:
To produce by hand (Method A)
To produce by machine one operator to one machine (Method B)
To produce by machine one operator to two machines (Method C)
To produce by machine, one operator to three machines (Method D);
The cost of manufacturing the article by different methods are as follows:

Method	A	B	C	D
Cost per article (Rs)				
Material 1 unit	5.00	5.00	5.00	5.00
Direct labour @ Rs.3 per Man hour	5.00	3.00	1.70	1.50
Variable overhead @ Rs.2 Per man hour	3.30	2.00	1.10	1.00
Variable overheads @ Rs.1 Per man hour	-	1.00	1.10	1.50
	------	--------	-------	--------
Total marginal cost	13.30	11.00	8.90	9.00
Fixed overhead @ Re.1/- Per man hour	1.70	1.00	0.60	0.50
Fixed overhead at Rs.6 per Machine hour	-	6.00	6.90	9.00

Total cost	Rs.15.00	18.00	16.40	18.50
Production per man hour	0.60	1	1.75	2.00
Production per machine hour	--	1	0.875	0.66

Solution

Method	**A**	**B**	**C**	**D**
Selling price per unit (Rs)	20.00	20.00	20.00	20.00
Marginal cost per unit (Rs)	(13.30)	(11.00)	(8.90)	(9.00)
Contribution per unit	6.70	9.00	11.10	11.00
Contribution per unit of Material	6.70	9.00	11.10	11.00
	1	1	1	1
	Rs.6.70	- Rs.9.00	- Rs.11.10	- Rs.11.00
Contribution Per man hour	-6.70x6	-9 x1	-11.10 x1.75	- 11x 2
	- Rs.4.00	- Rs.9.00	- Rs.19.40	-Rs.22.00
Contribution per Machine hour	-	-9.00x1	-11.10 x 8.75	-11x66
	-	- Rs.9.00	- Rs.9.7	- Rs.7.30

If there is no limiting factor, Method C. should be selected as it generates the highest contribution per unit.

If a limiting factor was in 0peration, the method to be adopted should be the one which gives the highest contribution per unit of the limiting factor.

Thus

(1) If material is the limiting factor, method C should be adopted.

(2) If manpower is the limiting factor, method D should be adopted.

(3) If machine capacity is the limiting factor method c should be adopted.

Points to Remember

1. The decision would hold good till the machine capacity is fully utilised. After that if additional production is required it could be produced by hand.

2. The decisions would hold good where only one product is manufactured. If a variety of products are manufactured and full capacity has been reached, further investigation is required. Under such a situation the effect of various alternatives on the total contribution needs to be considered.

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6.7 MARGINAL COST AND PRODUCT PRICING

A long-term pricing policy should aim to recover more than the full cost to ensure a reasonable return on capital employed. Affirm cannot survive of it has to sell its products continuously below full cost.

Marginal cost may be used as a basis for Short term pricing decisions specially with respect to non repetitive orders under difficult business conditions when acceptance of lower contributions and profit margins may be necessary.

When capacity is unused, acceptance of an order with lower contribution will at l3ast particularly meet the fixed cost. Even that amount of contribution would not be earned if the order is refused.

The following factors need to be c0osidered in fixing selling prices when demand is below normal:

(a) the amount amounts the rate of contribution which a proposed selling price would yield.

(b) the probability of securing an order with higher contribution during the period of execution of the order.

(c) the proposed concession, when compared with the normal selling price on full cost basis;

(d) the probable adverse effects on future sales

When one or more of the resources are scarce (e.g. material is scarce), the first consideration must be to reserve the same for orders which would yield the highest rates of contribution per unit of the scarce resource (limiting factor).

A decision to sell at a lower price might also have an adverse upon the firm's general level of selling prices in its established market. This aspect should also be carefully evaluated before accepting an order with lower contribution.

The following may be other considerations which strongly justify acceptance of an ordered with lower contribution at the time of adverse trade situations :

(i) To hold together the skilled labour force

(ii) To keep the plant and machinery in operation and the workers busy

(iii) To utilise the materials already received

(iv) To obviate the costs involved in the closing and reopening of the plant.

(v) To maintain the sales of complementary products at a satisfactory level.

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(vi) To maintain the established markets to obviate additional sales promotion expenses in re establishing the markets.

Selling below full cost prices even under a normal situation, may be adopt5ed in order to:

(i) introduce a new product

(ii) execute an order in a special market segment (say defence supply) which is immune from other market segments

(iii) expand the export market and

(iv) dispose of a product which deteriorates fast

Illustration 6.6

The BALAJI & Company manufactures and sells direct to consumers 10,000 jars of Balaji JARS per month at Rs.1.25 per Jar. The company's normal production capacity is 20,000 jars of now per month. An analysis of cost for 10,000 jars is given below:

	Rs.
Direct material	1,000
Direct labour	2,475
Power	140
Miscellaneous supplies	430
Jars	600
Fixed expenses of manufacturing, selling And administration	7,955
Total	Rs. 12,600

The Company has received on offer for the export under a different brand name of 1,20,000 jars of at 10,000 jars per month at 75 paise a jar.

Write a short report on the advisability or otherwise of accepting the offer.

Solution

Statement of Contribution from the Export Order

			Rs.
Selling price per unit			0.7500
Variable cost per unit :			
Direct material	Rs.1,000 /10,000	0.1000	
Direct labour	Rs.2,475 /10,000	0.2475	
Power	Rs. 140 /10,000	0.0140	
Misc.supplies	Rs. 430 /10,000	0.0430	
Jars	Rs. 600 /10,000	0.0600	
			(0.4645)
Contribution margin per unit			Rs.0.2855

Contribution per month:
Rs.0.2855 x 10,000 Rs.2,855

Acceptance of the export order would result in incremental contribution of Rs.2,855 per month:

The following statement reveals monthly profit with and without acceptance of order.

	Present Position	**Proposed Offer**	**Total**
	(10000 jars) Rs.	(10,000 jars) Rs.	(20000 jars) Rs.
Sale value	12,500	7,500	20,000
Variable cost of sales @Rs.0.4646 per unit	(4,645)	(4,645)	(9,290)
Contribution	7,855	2,855	10,710
Fixed cost	(7955)	-	(7955)
Profit	(100)	2,855	2,755

It is advisable to accept the order provided.

(i) Interest on incremental working capital would be lower than the total contribution from the export order.

(ii) Acceptance of the export order with lower contribution would not adversely affect the price in home market or the future sales.

(iii) There is no possibility for dumping i.e. re-export to the supplier.

(iv) There is no possibility of securing an order with higher contribution during the period of execution of the order.

6.8 COST VOLUME PROFIT ANALYSIS

6.8.1 Introduction:

The aim of Cost Volume Profit (CVP analysis is to have a fair estimate of the total cost, total reven7ueand thereby profit at various sale volumes. Determination of the Breakeven point (the sales volume at which total sales revenue equals the total cost i.e. the point at which neither profit is earned nor loss is made) and the Margin of safety (the difference between Break even sale and total sales) is incidental to C.V.P analysis.

The following underlying simplistic assumptions limit the precision and reliability of a given C.V.P. analysis:

(i) Fixed and variable cost patterns can be established with reasonable accuracy and that fixed costs remain static and marginal costs are completely variable at all levels of output.

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(ii) Selling prices are constant at all sales volumes;

(iii) Factor prices (.e.g. material prices, wage rates) are constant at all sales volumes.

(iv) Efficiency and productivity are to be unchanged

(v) In a multi product situation there is constant sales mix at all levels of sales

(vi) Volume is the only relevant factor affecting cost.

(vii) The volume of production equals the volume of sales or accretion/decretion to inventory levels are insignificant.

6.8.2 The following are the uses of C – V – P Analysis:

(i) To determine the Break even points in terms of unit or sale value;

(ii) To ascertain the Margin of Safety

(iii) To estimate profits or losses at various levels of output

(iv) To assess the likely effect of management decisions such as an increase or a reduction in selling price, adoption of a new method of production to reduce direct labour and increase output, etc.

(v) to determine the optimum selling price.

6.8.3 Marginal Cost Equation

The fundamental concept underlying marginal costing technique can be expressed in the form of a mathematical equation which is as below:

Sn = Sale value of 'n'th level of activity/

Vn = Toptal variable cost at 'n' the level of activity

Cn = Total contribution of 'n' th level of activity

F = Total fixed cost.

Pn = Profit at 'n' the level of activity.

It is worth nothing that F is not written as Fn(to be read as F sub n)because fixed cost remains the same at all levels of activity.

In any given problem, if out of the four factors (i.e. Sn Vn F and Pn) any three are known, the fourth can be worked out.

At Break even point, profit is 'zero', that is, contribution is equal to fixed cost. The following diagram brings this point to focus and also reveals that the profit is equal to contribution from the "Margin of safety":

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TOTAOL SALES	= BREAK EVEN SALES + MARGIN OF SAFETY	
Contribution	Contribution	Contribution
Equals	equals	equals
Fixed cost + Profit	Fixed cost	Profit

6.8.4 Contribution/Sales Ratio (C/S Ratio)

This is given by the formula

$$\text{C/s ratio} = \frac{Cn}{Sn} \times 100 = \frac{Sn - Vn}{Sn} \times 100$$

C/S ratio expresses the percentage of sales which contribute towards fixed costs and profit. If we assume that contribution per unit is constant. C/S ratio will remain constant at all sale volumes.

C/S ratio is loosely referred to as P/V (Profit/volume) Ratio

6.9 BREAK-EVEN SALES

Break even sales is the sales volume, expressed either in the terms of the number of units or in terms of sale valu7e, at which the total sales revenue equals the total cost.

In determining Break-even sales, we need to know

(i) Fixed cost and

(ii) Contribution per unit or C/S ratio

At Break even point total contribution equals the fixed costs, hence Break even point in terms of unit is calculated by dividing total fixed costs by contribution per unit. The following simple example illustrates the point.

Illustration 6.7

The following information is available from the annual budget of a company manufacturing only one item:

Budgeted output and sales		5,000 units
Budgets Selling price per unit		Rs.40
Budgeted costs per unit		
Material	Rs.15	
Direct labour	Rs. 5	
Variable overhead	Rs.10	
Fixed cost per unit	Rs. 5	
	-------	(35)
Budgeted profit per unit		Rs.5

Calculate the Break even point both in terms of the number of units and sale value.

Solution

In the absence of any other information it is assumed that direct materials and direct labour cost are variable costs. Contribution per unit of the given product is as follows :

Sales price		**Rs.40**
Material	Rs.15	
Direct labour	5	
Variable overhead	10	
	----	30

		10

Fixed cost per unit, included in the total cost per unit, is average fixed cost per unit, calculated on the basis of budgeted fixed cost (total) and budged output. Therefore, budgeted fixed cost (total) must be:

Rs.5 x 5,000 (i.e. Rs.25,000)

The two factors (.e.g. fixed costs and contribution margin per unit) are now known to us and therefore we can calculate the Break even point.

$$\text{Break even point} = \frac{\text{Fixed cost}}{\text{Contribution per unit}}$$

$$= \frac{\text{Rs.25,000}}{\text{Rs.10}} = 2{,}500 \text{ units}$$

Proof (Not required in examination)

Sales (2,500 x Rs.40)		Rs.1,00,0 00
Variable costs (2,500 x Rs.30)	Rs.75,000	
Fixed costs	Rs.25,000	Rs.1,00,000
Profit		Nil

- Break even point in terms of sales value is usually calculated by using C/ ratio.
- C/S ratio can be calculated with reference to either contribution per unit or total contribution at the given sale volume.

$$\text{C/S ratio} = \frac{\text{Contribution margin per unit}}{\text{Selling price per unit}} \times 100$$

$$= \frac{10}{40} \times 100 = 25\%$$

$$\text{or C/S Ratio} = \frac{\text{Budgeted sales} - \text{Variable costs of sales}}{\text{Budged Sales}} \times 100$$

$$= \frac{\text{Rs.50,000}}{2{,}00{,}000} \times 100 = 25\%$$

Note :

Budgeted sales = Rs.40 x 5000 = Rs.20,00,000

Variable costs of sales = 30 x 5,000 = Rs.1,50,000

Break even sales in terms of sale value (but not in terms of units) is calculated by dividing fixed cost by CS ratio.

$$\text{Break even point} = \frac{\text{Fixed costs}}{\text{C/S ratio}}$$

$$= \frac{\text{Rs.25,000}}{25\%} = \frac{\text{Rs.25,000}}{25/100}$$

$$= \frac{\text{Rs.25,000 x 100}}{25}$$

$$= \text{Rs.1,00,000}$$

Proof (Not required in examination)

Break even point in terms of units 2,500 units

Selling price per unit Rs.40

Break even point in terms of sales value Rs.40 x 2,500 = Rs.1,00,000

6.10 MARGIN OF SAFETY

Margin of safety is the d98fference between the total sales and sales at the break even point. This provide very useful information to management, that is, by how much can sales drop below the budgeted sales before a loss is incurred. Margin of safety is usually expressed as a percentage of expected sales.

In our previous illustration, margin of safety is 2,500 units or 50% of budgeted sales as calculated below:

Budgeted sales	5,000 units
Break even point	(2,500 units)
Margin of safety	2500 units

i.e. $\frac{\text{2,500units}}{\text{5,000 units}} \times 100 = 50$ of Budgeted Sales

C/S Ratio and Break Even Point in a Multi Product Situation

In multi product situation it is not possible to express break even point in terms of units. It is quite likely that different measuring units or used to express sales quantity of different products, products may not be comparable and contribution per unit would be different.

Therefore, under a multi product situation break even point needs to be calculated in terms of sale value by using C/S ratio. This may, however, pose a difficulty because all the products might not have the same C/S ratio. We may obviate this difficulty by assuming a constant mix of sales, at all sale, volumes, in other words, it is assumed that a percentage movement in total sales is accompanied by the same percentage movement in sales of all the products in the product mix.

Break even point is calculated with the following assumptions:

(i) Constant C/S ratio for each product

(ii) Constant sales mix

(iii) Constant fixed cost.

The following are the steps involved in calculating the break even point:

(i) Calculate the C/S ratio for each product.

(ii) Calculate weighted average C/S ratio in relation to expected proportion of sales

(iii) Use the weighted average C/S ratio to calculate break even pointing terms of sale value.

Illustration 6.8

(a) Asian Paints Ltd. Manufactures and sells four types of products under the brand names A, B, C and D.. The sales mix in value comprises 331%, 41 2%,, 162% and 81% of A, B, C, and D respectively. The total budgeted sales (100%) are Rs.60,000 per month. Operating costs are:

Variable costs:

Product	A	60% of selling price
	B	68% of selling price
	C	80% of selling price
	D	40% of selling price

Fixed cost Rs.14,700 per month

Calculate the break even point for the products as on overall basis.

(b) It has been proposed to introduce a change in the sales mix as follows, the total sales per month remaining Rs.60,000

Product	A	25%
	B	40%
	C	30%
	D	5%

Assuming that the proposals is implemented calculate the break even point.

Solution

(a) C/S ratio for each product :

Product	Variable cost to sales ratio	C/S ratio (100-Variable cost to sales ratio)	
A	60%	(100-60)	i.e.40%
B	68%	(100-68)	i.e. 32%
C	80%	(100-80)	i.e. 20%
D	40%	(100-40)	i.e. 60%

Weighted average C/S ratio:

Product		C/S ratio (%age)
A	33 1/3 % x 40	13.33
B	41 2/3 % x 32	13.34
C	16 2/3 % x 20	3.33
D	08 1/3% x 60	5.00
		35.00

Break even point : $\frac{\text{Fixed costs}}{\text{C/S ratio}} = \frac{\text{Rs.14,700}}{35\%}$

$= \frac{\text{Rs.14,700}}{35/100} = \frac{\text{Rs.14,700 x 100}}{35}$

= Rs.42,000 in term s of sale value per month

(b) Weighted average C/S ratio with changed sales mix, without any change in individual C/S ratio :

Product		C/S ratio (% age)
A	25% x 40	10.00
B	40% x 32	12.80
C	30% x 20	6.00
D	5% x 60	3.00
		31.80

Break-even point: $\frac{\text{Fixed cost}}{\text{C/S ratio}}$

$= \frac{\text{Rs.14,700}}{31.80\ \%} = \frac{\text{Rs.14,700}}{31.80/100}$

$= \frac{\text{Rs.14700 x 100}}{31.80}$

= Rs.46,226

Proof (Not required in examination)

Product	Old sales Mix		New Sales Mix	
	Sales	Contribution	Sales	Contribution
	Rs.	Rs.	Rs.	Rs.
A	60,000x331/3%	20,000x40%	60,000x235%	15,000x40%
	i.e.20,000	i.e.8,000	i.e. 15,000	i.e. 6,000
B	60,000x412/3%	25,000x32%	60,000x40%	24,000x32%

	i.e. 25,000	i.e.8,000	i.e.24,000	i..e 7,680
C	60,000x162/3%	10,000x20%	60,000x30%	18,000x20%
	i.e. 10,000	i.e. 2,000	i.e.18,000	i.e.3,600
D	60,000x81/3%	5000x60%	60,000x5%	3,000x60%
	i.e.5,000	i.e.3,000	i.e.3,000	i.e.1,800
Total	Rs.60,000	Rs.21,000	Rs.60,000	Rs.19,080

Weighted average C/S ratio

$\frac{\text{Rs.21,000}}{\text{Rs.60,000}} \times 100$

i.e. 35%

Weighted average C/S ratio

$\frac{\text{Rs.19,080}}{\text{Rs.60,000}} \times 100$

i.e. 31.80%

Uses of CVP Aalysis

We have covered the basic principles of CXVP analysis which can be applied to specific management problems. The following illustrations Have shown the application of these principles in decision making.

Illustration 6.9

A manufacturing company produces three products P, Q and R. the following information is available :

	PER UNIT		
	P	Q	R
	Rs.	Rs.	Rs.
Budgeted selling price	25	12	30
Standard variable costs	20	8	20
Budgeted output (units)	2,000	5,000	20,000

Budged fixed cost Rs.1,60,000

The Marketing manager is confident that he would be able to achieve budgeted sales for products P and Q. However he is unable to estimate correctly the sales of R. According to his estimate it can be anything between 10,000 units and 30,000 units

Calculate how many units of R need to be sold to achieve break even. Assume that sales of Q will be as per budget.

Solution: Contribution per unit :

	P	Q	R
	Rs.	Rs.	Rs.
Selling price per unit	25	12	30
Variable cost per unit	(20)	(8)	(20)
Contribution per unit	5	4	10

At break even point, contribution fund (i.e. total contribution from all the products) is equal to fixed cost and, therefore, required contribution is Rs.1.60,000. Contribution from products P and Q at budgeted output:

Product P : Rs.5 x 2,000 i.e.	Rs.10,000
Product Q: Rs.4 x 5,000 =	Rs.20,000
Total	Rs.30,000

Required contribution from Product R :

Required contribution fund	Rs.1,60,000
Contribution from P and Q	(Rs. 30,000)
Required contribution from R	Rs.1,30,000

Number of units of R to be sold to achieve break even.

$$= \frac{\text{Contribution required}}{\text{Contribution per unit}}$$

$$= \frac{\text{Rs.1,30,000}}{\text{Rs.10}}$$

= 13,000 units.

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